RESOURCESFULNESS, ACADEMIC STRESS, DISPOSITIONAL OPTIMISM, AND EATING STYLES AMONG FIFTH AND SIXTH GRADERS

by

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For the degree of Doctor of Philosophy

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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table of Contents</td>
<td>i</td>
</tr>
<tr>
<td>List of Tables</td>
<td>iii</td>
</tr>
<tr>
<td>List of Figures</td>
<td>vi</td>
</tr>
<tr>
<td>Acknowledgements</td>
<td>viii</td>
</tr>
<tr>
<td>Abstract</td>
<td>x</td>
</tr>
<tr>
<td>CHAPTER 1: INTRODUCTION</td>
<td></td>
</tr>
<tr>
<td>Background and Significance</td>
<td>3</td>
</tr>
<tr>
<td>Problem</td>
<td>21</td>
</tr>
<tr>
<td>Purpose</td>
<td>24</td>
</tr>
<tr>
<td>Theoretical Framework</td>
<td>24</td>
</tr>
<tr>
<td>Research Questions</td>
<td>38</td>
</tr>
<tr>
<td>CHAPTER 2: REVIEW OF THE LITERATURE</td>
<td></td>
</tr>
<tr>
<td>Children as Major Study Participants</td>
<td>42</td>
</tr>
<tr>
<td>Overview of Children’s Weight Status</td>
<td>56</td>
</tr>
<tr>
<td>Children’s Eating Behaviors and Eating Styles</td>
<td>63</td>
</tr>
<tr>
<td>Overview of Stress, Cognitive Appraisals, and Coping in Children</td>
<td>83</td>
</tr>
<tr>
<td>Self-Control Behaviors and Resourcefulness</td>
<td>94</td>
</tr>
<tr>
<td>Dispositional Optimism/Pessimism</td>
<td>114</td>
</tr>
<tr>
<td>Theoretical and Empirical Linkages</td>
<td>132</td>
</tr>
<tr>
<td>CHAPTER 3: METHOD</td>
<td></td>
</tr>
<tr>
<td>Design</td>
<td>141</td>
</tr>
</tbody>
</table>
Sampling………………………………………………………………………… 142
Measurement………………………………………………………………….. 149
Data Collection Procedures………………………………………………… 163
Data Management and Data Analysis…………………………………….. 170

CHAPTER 4: RESULTS

Response Rate………………………………………………………………… 178
Preliminary Data Analysis…………………………………………………… 179
Results of Research Questions……………………………………………… 197
Additional Analysis…………………………………………………………… 255
Summary of the Findings…………………………………………………….. 256

CHAPTER 5: DISCUSSION AND RECOMMENDATIONS

Discussion of the Findings…………………………………………………. 261
Limitations…………………………………………………………………… 306
Study Implications…………………………………………………………… 314
Recommendations…………………………………………………………… 321
Conclusions………………………………………………………………….. 326

APPENDIX

Appendix A Letters of Approval………………………………………… 328
Appendix B Informed Consent Documents……………………………… 330

REFERENCES…………………………………………………………………… 334
# List of Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 1.1</td>
<td>Three Eating Styles</td>
<td>6</td>
</tr>
<tr>
<td>Table 3.1</td>
<td>Summary of Measurements</td>
<td>149</td>
</tr>
<tr>
<td>Table 3.2</td>
<td>The DEBQ-C and Three Subscale Scales</td>
<td>152</td>
</tr>
<tr>
<td>Table 3.3</td>
<td>The DEBQ and Three Subscale Scales</td>
<td>160</td>
</tr>
<tr>
<td>Table 3.4</td>
<td>Research Questions and Statistical Methods</td>
<td>173</td>
</tr>
<tr>
<td>Table 4.1</td>
<td>Response Rate</td>
<td>178</td>
</tr>
<tr>
<td>Table 4.2</td>
<td>Demographic Characteristics of the Child Participants</td>
<td>180</td>
</tr>
<tr>
<td>Table 4.3</td>
<td>Weight Status of Child Participants</td>
<td>181</td>
</tr>
<tr>
<td>Table 4.4</td>
<td>Classification of Eating Styles (Child) (N = 368)</td>
<td>183</td>
</tr>
<tr>
<td>Table 4.5</td>
<td>Descriptive Characteristics of the Caregiver Participants</td>
<td>184</td>
</tr>
<tr>
<td>Table 4.6</td>
<td>Classification of Eating Styles (Caregiver) (N = 368)</td>
<td>185</td>
</tr>
<tr>
<td>Table 4.7</td>
<td>Description of the Empirical Indicators and Reliability Coefficient (Cronbach’s Alpha) (N = 368)</td>
<td>186</td>
</tr>
<tr>
<td>Table 4.8</td>
<td>Factor Loadings of the CLOT-R (N = 368)</td>
<td>187</td>
</tr>
<tr>
<td>Table 4.9</td>
<td>Reliability Coefficient (Cronbach’s Alpha) of CLOT-R</td>
<td>187</td>
</tr>
<tr>
<td>Table 4.10</td>
<td>Correlation Matrix of the Demographic Characteristics</td>
<td>193</td>
</tr>
<tr>
<td>Table 4.11</td>
<td>Correlation Matrix of Children’s Satiety Responsiveness and Hunger/Satiety Cues</td>
<td>194</td>
</tr>
<tr>
<td>Table 4.12</td>
<td>Correlation Matrix of Dispositional Optimism and Pessimism</td>
<td>195</td>
</tr>
<tr>
<td>Table 4.13</td>
<td>Correlation Matrix of Children’s Eating Styles</td>
<td>196</td>
</tr>
<tr>
<td>Table 4.14</td>
<td>Correlation Matrix of Caregivers Eating Styles</td>
<td>197</td>
</tr>
<tr>
<td>Table 4.15</td>
<td>Differences on the Process Regulators among Dichotomous Variables</td>
<td>200</td>
</tr>
</tbody>
</table>
Table 4.16 Correlation of the Contextual Factors and Process Regulators…… 202
Table 4.17 Differences on the Resourcefulness Skills among Dichotomous Variables (N = 368)………………………………………………… 204
Table 4.18 Correlation of the Contextual Factors and Children’s Resourcefulness Skills (N = 368)……………………………………………… 205
Table 4.19 Differences on the Children’s Eating Styles among Dichotomous Variables…………………………………………………………… 206
Table 4.20 Correlation of the Contextual Factors and Children’s Eating Styles…………………………………………………………………… 207
Table 4.21 Correlation of the Process Regulators and Children’s Resourcefulness Skills (N = 368)………………………………………………… 209
Table 4.22 Correlation of the Process Regulators and Children’s Eating Styles……………………………………………………………………… 210
Table 4.23 Correlation of the Resourcefulness Skills and Eating Styles…… 211
Table 4.24 Mediating Effect of Academic Stress on Contextual Factors and Resourcefulness Skills……………………………………………… 213
Table 4.25 Mediating Effect of Dispositional Pessimism on Contextual Factors and Resourcefulness Skills………………………………………… 217
Table 4.26 Mediating Effect of Dispositional Optimism on Contextual Factors and Resourcefulness Skills………………………………………… 220
Table 4.27 Predicting Effects of Process Regulators on Resourcefulness Skills……………………………………………………………………… 223
Table 4.28 Mediating Effect of Resourcefulness Skills on Process Regulators and Emotional Eating……………………………………………… 224
Table 4.29 Mediating Effect of Resourcefulness Skills on Process Regulators and External Eating………………………………………………… 227
Table 4.30 Mediating Effect of Resourcefulness Skills on Process Regulators and Restrained Eating……………………………………………… 229
Table 4.31 Mediating Effects of Academic Stress and Resourcefulness Skills on Contextual Factors and Emotional Eating……………… 233
Table 4.32  Mediating Effects of Dispositional Optimism and Resourcefulness Skills on Contextual Factors and Emotional Eating

Table 4.33  Mediating Effects of Academic Stress and Resourcefulness Skills on Contextual Factors and External Eating

Table 4.34  Mediating Effects of Dispositional Optimism and Resourcefulness Skills on Contextual Factors and External Eating

Table 4.35  Mediating Effects of Academic Stress and Resourcefulness Skills on Contextual Factors and Restrained Eating

Table 4.36  Mediating Effects of Dispositional Optimism and Resourcefulness Skills on Contextual Factors and Restrained Eating

Table 4.37  Mediating Effect of Process Regulators on Contextual Factors and Resourcefulness Skills
<table>
<thead>
<tr>
<th>Figure</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 1.1</td>
<td>Theoretical Substruction Diagram</td>
<td>23</td>
</tr>
<tr>
<td>Figure 1.2</td>
<td>Proposed Study Model (RQ#1 – RQ#6)</td>
<td>40</td>
</tr>
<tr>
<td>Figure 1.3</td>
<td>Proposed Mediation Study Model (RQ#7 – RQ#9)</td>
<td>41</td>
</tr>
<tr>
<td>Figure 3.1</td>
<td>The Mediation Diagram</td>
<td>175</td>
</tr>
<tr>
<td>Figure 4.1</td>
<td>Mediating effect of mediator between IV and DV</td>
<td>199</td>
</tr>
<tr>
<td>Figure 4.2</td>
<td>Mediating effect of process regulator between contextual factors and resourcefulness skills</td>
<td>212</td>
</tr>
<tr>
<td>Figure 4.3</td>
<td>Mediating effect of academic stress between satiety responsiveness and resourcefulness</td>
<td>216</td>
</tr>
<tr>
<td>Figure 4.4</td>
<td>Mediating effect of academic stress between caregivers’ emotional eating and children’s resourcefulness skills</td>
<td>217</td>
</tr>
<tr>
<td>Figure 4.5</td>
<td>Mediating effect of dispositional optimism between hunger/satiety cues and resourcefulness skills</td>
<td>221</td>
</tr>
<tr>
<td>Figure 4.6</td>
<td>Relationships among contextual factors, process regulators, and resourcefulness skills</td>
<td>222</td>
</tr>
<tr>
<td>Figure 4.7</td>
<td>Mediating effect of resourcefulness skills between process regulators and eating styles</td>
<td>223</td>
</tr>
<tr>
<td>Figure 4.8</td>
<td>Mediating effect of resourcefulness skills between academic stress and emotional eating</td>
<td>224</td>
</tr>
<tr>
<td>Figure 4.9</td>
<td>Mediating effect of resourcefulness skills between dispositional optimism and emotional eating</td>
<td>225</td>
</tr>
<tr>
<td>Figure 4.10</td>
<td>Relationships between process regulators and emotional eating</td>
<td>226</td>
</tr>
<tr>
<td>Figure 4.11</td>
<td>Mediating effect of resourcefulness skills between academic stress and external eating</td>
<td>227</td>
</tr>
<tr>
<td>Figure 4.12</td>
<td>Mediating effect of resourcefulness skills between dispositional optimism and external eating</td>
<td>228</td>
</tr>
<tr>
<td>Figure 4.13</td>
<td>Relationships between process regulators and external eating</td>
<td>229</td>
</tr>
<tr>
<td>Figure 4.14</td>
<td>Mediating effects of process regulators and resourcefulness skills between contextual factors and eating styles</td>
<td>230</td>
</tr>
<tr>
<td>Figure 4.15</td>
<td>Mediating effects of academic stress and resourcefulness skills between satiety responsiveness and emotional eating style</td>
<td>235</td>
</tr>
<tr>
<td>Figure 4.16</td>
<td>Mediating effects of academic stress and resourcefulness skills between caregivers’ emotional eating and emotional eating style</td>
<td>236</td>
</tr>
<tr>
<td>Figure 4.17</td>
<td>Mediating effects of dispositional optimism and resourcefulness skills between hunger/satiety cues and emotional eating style</td>
<td>239</td>
</tr>
<tr>
<td>Figure 4.18</td>
<td>Relationships between contextual factors and emotional eating</td>
<td>240</td>
</tr>
<tr>
<td>Figure 4.19</td>
<td>Mediating effects of academic stress and resourcefulness skills between satiety responsiveness and external eating</td>
<td>244</td>
</tr>
<tr>
<td>Figure 4.20</td>
<td>Mediating effects of academic stress and resourcefulness skills between caregivers’ emotional eating and children’s external eating</td>
<td>245</td>
</tr>
<tr>
<td>Figure 4.21</td>
<td>Mediating effects of dispositional optimism and resourcefulness skills between hunger/satiety cues and external eating style</td>
<td>248</td>
</tr>
<tr>
<td>Figure 4.22</td>
<td>Relationships between contextual factors and external eating</td>
<td>250</td>
</tr>
<tr>
<td>Figure 4.23</td>
<td>A proposed single-step tri-mediation model</td>
<td>255</td>
</tr>
</tbody>
</table>
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Resourcefulness, Academic Stress, Dispositional Optimism, and Eating Styles among Fifth and Sixth Graders

Abstract

By

YA-FEN WANG

Background/Significance: Childhood obesity is a critical health issue worldwide because of its association with adverse health conditions and potentially harmful health consequences in later adulthood. Eating styles that may involve emotional, external, or restrained eating behaviors have been shown to be associated with overweight and obesity and can be influenced by stress, resulting in the use of unhealthy eating styles as a coping strategy. Research in adults has shown that cognitive-behavioral skills constituting resourcefulness are effective for coping with stress and performing health behaviors. However, few studies have examined whether resourcefulness skills are important in children. Purpose: This study examined the associations among academic stress, dispositional optimism, and resourcefulness in relation to eating styles in fifth and sixth graders in Taiwan. Theoretical framework: Rosenbaum’s theory of learned resourcefulness and Zauszniewski’s middle-range theory of resourcefulness and quality of life provided the context for examining the relationships among the study variables.

Method: A descriptive, correlational, cross-sectional approach was used with a convenience sample of 368 dyads of fifth- and sixth-grade children and their caregivers.
Findings: 26.24% of the children were overweight or obese. Children with a higher tendency toward emotional eating had greater academic stress and lower resourcefulness. Children with a higher tendency toward external eating had greater academic stress, lower dispositional optimism, and lower resourcefulness. Children’s restrained eating was associated with greater academic stress and higher dispositional optimism. Additionally, academic stress mediated the relationship between children’s satiety responsiveness and resourcefulness. Children’s resourcefulness mediated the relationships between academic stress and emotional or external eating. Conclusion: Findings generated from this study not only contribute to an understanding of the interrelationships among academic stress, dispositional optimism, resourcefulness, and eating styles of fifth and sixth graders in Taiwan but also provide rich and valuable information for the advancement of the nursing discipline, including clinical practice, health policy, theory development, and nursing education, which will enhance a healthy lifestyle in children and their families. Further research, including the examination of relationships between eating styles and resourcefulness over time, is recommended in larger, more diverse samples.
Resourcefulness, Academic Stress, Dispositional Optimism, and Eating Styles among Fifth and Sixth Graders

CHAPTER 1: INTRODUCTION

Introduction

Childhood obesity is an important health issue worldwide, especially in most economically developed countries (Hedley et al., 2004; Vuorela, Saha, & Salo, 2009; Wang & Lobstein, 2006). More recently, the prevalence of childhood overweight and obesity has also increased rapidly in developing countries, including countries in Asia, because these countries are beginning to have an increasingly Westernized diet and a less active lifestyle (Deckelbaum & Williams, 2001; Misra & Khurana, 2008; Yoon et al., 2006).

Eating styles, an essential dimension of eating behaviors, are a major determinant of childhood overweight and obesity (Van Strien & Oosterveld, 2008; Ventura & Birch, 2008). Eating behaviors have been shown to play an important role in an individual’s health and can be stimulated by stress in both adults and children (Chen, Yeh, & Kennedy, 2007; Levine, Smolak, Moodey, Shuman, & Hessen, 1994; Martyn-Nemeth, Penckofer, Gulanick, Velsor-Friedrich, & Bryant, 2009; Serlachius, Hamer, & Wardle, 2007; Talen & Mann, 2009; Torres & Nowson, 2007). Cognitive appraisals (i.e. academic stress and dispositional optimism/pessimism) represent how an individual interprets a situation (Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986) so that he or she can assess the strength and the degree of stress (Lazarus & Folkman, 1984). A study examining the weight status and coping strategies in Taiwanese children ages 7-8 found that emotional eating was related to having a greater reliance on ineffective coping
strategies (Chen et al., 2007). Since coping strategies are learned during childhood and are developmentally progressive (Chen et al., 2007), studies identifying approaches that support effective coping strategies over reliance on problematic eating to manage stress are needed and will benefit children. Research in adults has shown that resourcefulness is a set of cognitive and behavioral skills that an individual uses to cope with stress and perform health practices (Akgun & Ciarrochi, 2003; Kennett, Worth, & Forbes, 2009; Zauszniewski & Chung, 2001); however, few studies have examined resourcefulness in pediatric populations. Studies conducted in pediatric samples found that highly resourceful children were more likely to have better adaptive functioning (Chang, Zauszniewski, Heinzer, Musil, & Tsai, 2007), more positive thoughts (Zauszniewski, Chung, Chang, & Krafcik, 2002), higher self-esteem (Preechawong et al., 2007), and children were better able to cope with life’s demands or academic stress (Huang & Guo, 2009). In addition, children who were reported to have a higher level of resourcefulness were less likely to experience stress, anxiety, and depressive symptoms (Chang et al., 2007; Hamama, Ronen, & Feigin, 2000; Hamama, Ronen, & Rahav, 2008; Huang, Sousa, Tu, & Hwang, 2005; Huang & Guo, 2009).

Hence, the purpose of this study was two-fold. The first aim was to explore the relationships among resourcefulness, academic stress, dispositional optimism/pessimism, and eating styles among fifth and sixth graders in Taiwan. The second aim was to discuss the mediating roles played by process regulators (academic stress and dispositional optimism/pessimism) on the relationships between contextual factors and self-control behavior (children’s resourcefulness skills), the mediating roles of self-control behavior on the relationship between process regulators and target behavior (children’s eating
styles), and the mediating roles of process regulators and self-control behavior on the relationship between contextual factors and target behavior. In addition, since few studies have focused on children’s resourcefulness, the findings of this study helped to extend the discussion of resourcefulness into pediatric populations. This chapter begins with describing the background and significance of the problem, the purpose of the study, and the theoretical framework; it then proposes the research questions.

**Background and Significance**

Globally, the prevalence of childhood overweight and obesity has increased rapidly (Hedley et al., 2004; Vuorela et al., 2009; Wang & Lobstein, 2006). In children and adolescents (ages 2-18 in Taiwan and ages 2-19 in the United States [US]), overweight is defined as a Body Mass Index (BMI) at or above the 85th and lower than the 95th BMI-for-age percentile; and, obesity is defined as a BMI at or above the 95th percentile (Centers for Disease Control and Prevention [CDC], 2011; Chen et al., 2003; Food and Drug Administration, Department of Health, Executive Yuan, Republic of China [Taiwan], 2010). According to the latest Nutrition and Health Survey in Taiwan (NAHSIT) Elementary School Children (NAHSIT Children, 2001-2002), there was an estimated 27% of children ages 6-12 who were overweight and obese (Chu & Pan, 2007). Likewise, in the US, about 33% of children, aged 6-11, were overweight and obese in the period of 2009-2010 (Ogden, Carroll, Kit, & Flegal, 2012).

Childhood overweight and/or obesity is critically important because it is not only associated with current negative health conditions but also with a variety of adverse physical and psychological health consequences in later adulthood (American Academy of Pediatrics [AAP], n.d.; Dietz & Robinson, 2005). Although the overall prevalence of
overweight and obesity was about the same across age groups (age 6-12) in Taiwan in the period of 2001-2002, the highest prevalence was found at age 11 for boys and at age 12 for girls (Chu & Pan, 2007). Scholars suggested that older children and adolescents were able to respond self-report measures more accurately than younger ones (Denham, Wyatt, Bassett, Echeverria, & Know, 2009; Wigelsworth, Humphrey, Kalambouka, & Lendrum, 2010). Furthermore, it has been found that children who were 10-12 years old were actually more reliable respondents than adolescents (Frank, 1991; Frank, Berenson, Schilling, & Moore, 1977). Hence, this study focused on children who were 10-12 years of age (grades five-six).

Children and adolescents who are overweight or obese may face significant physical, psychosocial, and economic consequences (AAP, n.d.; Dietz & Robinson, 2005; Fu, Wen, Yeh, & Chang, 2008; Wang & Dietz, 2002). The persistence of obesity is evident through life. Overweight children tend to remain overweight into adulthood (AAP, n.d.; Dietz & Robinson, 2005; Freedman et al., 2005), and they are at greater risk for having immediate negative outcomes and the development of early morbidities (Cali & Caprio, 2008) such as elevated blood pressure (Chu, 2001; Chu, Wang, Shieh, & Rimm, 2000; Freedman, Mei, Srinivasan, Berenson, & Dietz, 2007; Lin, Chu, & Hsieh, 2011), elevated cholesterol (Bell et al., 2007; Freedman et al., 2007), asthma (Gilliland et al., 2003; von Mutius, Schwartz, Meas, Dockery, & Weiss, 2001), and an increased risk of Type 2 diabetes (Bell et al., 2007; Cali & Caprio, 2008; Chu et al., 2000; Yoon et al., 2006). In addition, children who are overweight or obese also tend to have psychological distress because of being teased or isolated by peers or family, and that may further affect their eating behaviors (Haines, Neumark-Sztainer, Eisenberg, & Hannan, 2006; Hayden-
Healthy Behaviors and Eating Styles in Children

Eating behavior is a complicated phenomenon and has been identified as an indicator of children’s overweight and obesity (Pan, Lee, Chuang, Lin, & Fu, 2008; Van Strien & Oosterveld, 2008; Ventura & Birch, 2008). According to Ventura and Birch (2008), there are three different dimensions of children’s eating behaviors: eating styles, food preferences, and dietary intake. The dimension of eating styles refers to the tendencies of how a child eats; the food preferences dimension refers to a person’s food choices, likes or dislikes; and dietary intake is related to the quantity of food that is a person’s actual consumption. This study focused on eating styles because eating styles
will influence food preferences (Elfhag, Tynelius, & Rasmussen, 2010) and are associated with weight gain (Van Strien & Oosterveld, 2008). Moreover, as suggested by Kleiser and colleagues (2009), the ability to recognize past eating behaviors is more important than to understand current food preferences and consumption in predicting who will gain weight because obese people tend to underreport their food intake compared to their normal-weight counterparts.

Table 1.1.

*Three Eating Styles*

<table>
<thead>
<tr>
<th>Eating style</th>
<th>Theory</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional eating</td>
<td>Psychosomatic theory (Bruch, 1964, 1997; Ganley, 1989)</td>
<td>Eating occurs in response to stress or negative emotions in order to reduce psychological distress and anxiety</td>
</tr>
<tr>
<td>External eating</td>
<td>Externality theory (Schachter, 1968; Schachter &amp; Rodin, 1974)</td>
<td>Eating occurs in response to food-related stimuli such as smell of food or appearance of food</td>
</tr>
<tr>
<td>Restrained eating</td>
<td>Restraint theory (Herman &amp; Polivy, 1983)</td>
<td>Eating less than desired in order to maintain or lose weight; consequence of unsuccessful dieting</td>
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</table>

As presented in Table 1.1, three overeating styles: emotional, external, and restrained eating, have been identified (Van Strien, Frijters, Bergers, Defares, 1986). Emotional eating style is derived from psychosomatic theory (Bruch, 1964, 1997; Ganley, 1989). According to psychosomatic theory, food intake and psychological stress are correlated with each other when food is used as an emotional defense when faced with negative emotions, which leads to obesity because of over consumption (Kaplan & Kaplan, 1957; Serlachius et al., 2007; Torres & Nowson, 2007). Although decreasing appetite should be the natural physiological response when facing distress and stress (Bruch, 1964; Ganley, 1989; Greeno & Wing, 1994; Zesiewicz, 1992), Adam and Epel
(2007) suggested that stress can deregulate eating effects on the reward system. Consequently, emotional eating happens in response to negative emotions and will reduce psychological distress and anxiety (Bruch, 1964; Ganley, 1989; Van Strien & Oosterveld, 2008; Van Strien & Ouwens, 2003; Van Strien et al., 1986). In addition, emotional eating has been found to be the most important determinant for increased food consumption among these eating styles (Van Strien, 2000).

Derived from externality theory, external eating style refers to eating in response to food-related stimuli such as smell and taste of food (Schachter, 1968). Individuals with an external eating style tend to eat in the absence of hunger and consume larger amounts than necessary (Van Strien & Oosterveld, 2008; Van Strien & Ouwens, 2003).

The restrained eating style, explained by restraint theory (Herman & Polivy, 1983), proposes that overeating is a consequence of unsuccessful dieting. Since dieting may be easily abandoned when self-control is inhibited by stress, anxiety, or depression (Van Strien & Ouwens, 2003), restrained eating happens when an individual attempts to refrain from eating and is eating less than desired in order to maintain weight (Van Strien & Oosterveld, 2008; Van Strien & Ouwens, 2003).

Empirical studies examining these overeating styles and overweight/obesity in children or adolescents have mixed results. Studies indicated that emotional and external eating styles were positively related with caloric intake and weight gain in children (Braet & Van Strien, 1997; Webber, Hill, Saxton, Van Jaarsveld, & Wardle, 2009); in addition, these eating styles were significantly higher in obese children when compared with the reference group (Braet & Van Strien, 1997). Likewise, researchers investigated the differences in eating styles among overweight and normal-weight children aged 7-18
years and found that the external and restrained eating styles, but not the emotional eating style, existed among overweight groups when compared with normal-weight children (Braet et al., 2008). In addition, restrained eating was more obvious in all overweight children and adolescents when compared with normal-weight groups (Braet et al., 2008; Snoek, Van Strien, Janssens, & Engels, 2007). However, Wardle and associates (1992) found that only the restrained eating style was related with a higher BMI. Few studies on eating styles in children have been conducted in Taiwan. One of the few studies that focused on restrained eating among school-aged children indicated that having a restrained eating style was also related to children’s higher BMI (Peng, 2006).

Braet and associates (2008) suggested that age and gender needed to be considered when investigating eating styles in children and adolescents, and studies in this area have yielded mixed findings. In their study examining the differences in eating styles among children and adolescents, emotional and external eating styles, but not restrained eating style, were age-related and gender-specific (Braet et al., 2008). For example, a more emotional eating style was found in overweight adolescent girls than overweight children (Braet et al., 2008). Huang (2008) also found that age made a difference, in that older junior high students were found to be more likely to have the tendency to engage in emotional eating than younger students. However, a study of a sample of 7-12-year-old children found that younger children had higher scores of emotional and external eating than older children (Van Strien & Bazelier, 2007). Girls were more likely to display an emotional eating style, while boys showed a more external eating style (Braet et al., 2008; Hill, Draper, & Stack, 1994). No gender differences were found for restrained eating styles in children less than 13 years of age (Braet et al., 2008).
Another study conducted by Wardle and associates (1992) on eating styles in adolescents found that there were no gender differences in terms of the external eating style. Scholars have suggested that an individual’s eating should be guided by internal physiological hunger and satiety cues, rather than external and emotional cues, to determine when to stop eating (Polivy & Herman, 1992; Tribole & Resch, 1996). In other words, an individual only eats when physically hungry and stops eating when satisfied or before fullness is reached (Tribole & Resch, 1996). Hence, hunger and satiety may be considered as early precursors of obesity or dysfunctional eating (Wardle, Guthrie, Sanderson, & Rapoport, 2001). Research has documented that the individual who allowed internal hunger and satiety cues to guide their eating would have a higher sense of psychological well-being (Tylka, 2006) and lower BMI (Smith & Hawks, 2006; Tylka, 2006). Likewise, Wardle and colleagues (2001) reported that obese individuals were more easily under-responsive to their internal satiety cues, over-responsive to external food stimuli, and then would also tend to overeat in response to emotional arousal more than normal individuals. In addition, people with the tendency toward restrained eating were found to have a lower responsiveness to satiety cues as well (Herman & Polivy, 1983, 2011; Polivy & Herman, 1992).

Limited studies have suggested that parental behaviors might influence children’s eating through feeding style. Wardle and colleagues (2002) reported that mothers who had higher scores on emotional eating were found to have a more emotional feeding style (feeding in response to emotional distress); however, this feeding style was not related with either the mother’s or child’s BMI. In a study of parental behavior and adolescents’ emotional eating, researchers found that parents’ and adolescents’ emotional eating were
positively correlated (Snoek, Engels, Janssens, & Van Strien, 2007).

In conclusion, mixed and limited findings were found regarding the relationships between age, gender, eating styles, and overweight in children and adolescents. Hence, studies are needed in order to clarify relationships among the three eating styles, children’s age, gender, weight and BMI. Within different eating styles that are related to overweight and obesity, a more comprehensive investigation is needed. It is important for nursing professionals to be able to recognize the early signs of overeating styles that relate to overweight in order to implement acceptable and efficacious interventions to meet individualized needs (Braet et al., 2008).

**Resourcefulness**

Resourcefulness is a collection of self-control skills that a person has learned, formally or informally, through modeling, conditioning, or receiving formal instructions in order to achieve, maintain, or regain health (Rosenbaum, 1990; Zauszniewski, 2006). As proposed by Rosenbaum’s (1990) theory of learned resourcefulness and Zauszniewski’s (2006) middle-range theory of resourcefulness and quality of life (QOL), individuals have different degrees of resourcefulness because of different demographic backgrounds and learning experiences. Individuals need to determine their capability regarding resourcefulness when they face aversive situations. That is, resourcefulness is a learned characteristic and it helps individuals cope better with stress.

The study of resourcefulness in children is limited as most studies have focused on adolescents and adults. A rich body of research in adults has documented that resourcefulness had an effect on performing a positive behavioral change (Lévesque, Gauvin, & Desharnais, 2003), exhibiting fewer eating disturbances and practicing
healthier eating and lifestyles associated with lower BMI (Kennett & Nisbet, 1998; Kennett, Worth et al., 2009), showing fewer depressive symptoms (Huang et al., 2007; Liu et al., 2009), having more adaptive functioning (Lai, 2005; Zauszniewski, Lai, & Tithiphontumrong, 2006), and reporting a better QOL (Huang, Perng, Chen, & Lai, 2008; Zauszniewski, Picot, Roberts, Debane, & Wykle, 2005; Zauszniewski, Bekhet, & Suresky, 2009b; Zauszniewski, Chung, & Krafck, 2001). Research on resourcefulness in adolescents and young college students has also reported that highly resourceful persons were less likely to become depressed (Huang et al., 2005; Huang & Guo, 2009; Liu et al., 2009; Moon et al., 2009), more likely to have higher academic achievement (Kennett & Keefer, 2006; Kennett, Young, & Catanzaro, 2009), better able to use healthy behaviors or coping strategies to face life demands or academic stress (Akgun, 2004; Huang & Guo, 2009), have higher self-esteem (McWhirter, 1997; Preechawong et al., 2007), and predict healthier behaviors (Birkimer, Johnston, & Berry, 1993).

According to Rosenbaum (1990), the most important component of resourcefulness is a broad collection of self-control skills, which includes redressive and reformative self-control skills. Redressive self-control skills, such as positive self-instructions, occur when coping with difficulties (Rosenbaum, 1990). Reformative self-control skills include problem-solving skills and strategies that an individual will use to delay the need of gratification (Rosenbaum, 1990, 1993). These self-control skills, the main core of resourcefulness, are believed to be learned throughout life, starting in early childhood (Rosenbaum, 1990), but research on resourcefulness conducted in school-aged children is limited. Few studies conducted in school-aged children have shown that higher resourcefulness was related to greater adaptive functioning, fewer depressive
symptoms (Chang et al., 2007), more positive automatic thoughts (Zauszniewski, Chung et al., 2002), and fewer symptoms of stress and anxiety (Hamama et al., 2000; Hamama et al., 2008). For example, in a stress-provoking situation such as attending an examination, a resourceful person may use various coping skills to reduce the effect of stress on performance, whereas the performance of a less resourceful person may be adversely affected by his or her stressful state.

As Rosenbaum’s (1990) theory of learned resourcefulness and Zauszniewski’s (2006) middle-range theory of resourcefulness and QOL suggest, there are both intrinsic and extrinsic factors that influence resourcefulness. These contextual factors include age, gender, and caregiver’s resourcefulness. Studies regarding age, gender, and resourcefulness have revealed mixed findings. Age was not related to the degree of resourcefulness in studies of preadolescent girls and adolescents (Cawley, 2001; Panitrat, 2001). On the other hand, age was significantly related to resourcefulness among adolescents with asthma (Preechawong et al., 2007), depressive symptoms (Huang & Guo, 2009), and elementary school students with aggressive behavior (Ronen, Rahav, & Moldawsky, 2007). No significant gender differences have been found for self-reported resourcefulness in studies of children and adolescents (Ronen et al., 2007; Preechawong et al., 2007; Zauszniewski, Chung et al., 2002). However, gender differences have been found for resourcefulness in adult populations with women being more resourceful than men (Brewin, Andrews, & Furnham, 1996; Zauszniewski et al., 2001). Lastly, in the example of the relationship between caregivers’ and children’s resourcefulness, Zauszniewski and colleagues (2002) found that maternal resourcefulness had a direct correlation with their child’s resourcefulness.
In conclusion, being resourceful has been found to lead to a more positive behavioral change (Lévesque et al., 2003), which includes practicing healthy eating and maintaining exercise (Kennett, Worth et al., 2009), and having more adaptive functioning (Chang et al., 2007). Hence, having a greater understanding of the relationship between children’s levels of resourcefulness and healthier eating behaviors may enable healthcare professionals to further design effective intervention programs for children and their families to maintain healthy eating behaviors by using appropriate resourcefulness skills.

**Cognitive Appraisal**

Cognitive appraisal is defined as “the process through which the person evaluates whether a particular encounter with the environment is relevant to his or her well-being and, if so, in what ways” (Folkman et al., 1986, p.993). There are two main forms of cognitive appraisal, primary and secondary (Lazarus & Folkman, 1984). People assess the situation’s significance as irrelevant, benign positive, or stressful in the primary cognitive appraisal process. For example, benign positive cognitive appraisal refers to the individual’s perceiving the outcome as positive so that well-being is enhanced, whereas stress appraisal is a universal process in which a person constantly evaluates the significance of what is happening to his or her personal well-being (Lazarus & Folkman, 1984). The secondary appraisal process occurs when individuals develop expectations that represent their belief and self-evaluation regarding essential behaviors they can perform to achieve the desired goal (Bandura, 1977, 1982). Both individual and environmental factors influence how these appraisals work together, such as personal characteristics and situational stimuli (Lazarus & Folkman, 1984). According to Lazarus and Folkman (1984), combining these two basic forms of cognitive appraisal together,
primary appraisals of what is at risk and secondary appraisals of available coping skills, an individual will be able to determine the strength of the reaction and the degree of stress. In other words, cognitive appraisals determine the responses individuals adopt to cope with stressful situations; hence, cognitive appraisal plays an important role in the process of stress response (Lazarus & Folkman, 1984).

**Cognitive appraisal and academic stress.** Stress is defined by Lazarus and Folkman (1984, p. 19) as “a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being.” Stress appraisal, one kind of primary cognitive appraisal (Lazarus & Folkman, 1984), is a subjective perception and is thought about in terms of objective environmental conditions (Cohen, Kamarck, & Meruelstein, 1983).

There is a rich body of research on stress in the adult population, but not in children (Ryan-Wenger, Sharrer, & Campbell, 2005). As Sharrer and Ryan-Wenger (2002) reported, children, especially school-aged children, have had the ability to discuss their stressors. Academic stress has been identified as one of the major stressors experienced by school-aged children (Chang, Yeh, Chang, Chen, & Fong, 1993; Donaldson, Prinstein, Danovsky, & Spirito, 2000; Hasan & Power, 2004; Lau, 2002; M. Wu, 2006). In addition, Chinese parents usually put more emphasis on their children’s cognitive development and academic achievement than on their social, physical, and emotional development (Roopnarine, Shin, Jung, & Hossain, 2003; Yang, 2007), a situation which, in turn, puts additional pressure related to academic affairs on the children (Bossy, 2000). Academic stress was common and often adversely affected children’s physical and mental health (Lee & Larson, 2000). Research has revealed that
academic stress had an indirect influence on an individual’s health through changes in his or her health behavior, such as changing eating behaviors (Huang, 2008; Martyn-Nemeth et al., 2009). For instance, Huang (2008) found that academic stress had a positive correlation with emotional eating among junior high school students in Taiwan.

Stress has a cumulative negative effect (Morales & Guerra, 2006). Unmanaged and long-term stress has direct and indirect effects on an individual’s health, including being overweight or obese (Block, He, Zaslavsky, Ding, & Ayanian, 2009; Dietz & Robinson, 2005). Cumulative stress has also been found to have an influence on behavioral problems such as eating behaviors (Ball & Lee, 2000). The consequence of being overweight or obese may be due to using unhealthy eating behaviors as strategies, though ineffective ones, to cope with stress (Adam & Epel, 2007; Austin, Smith, & Patterson, 2009; Block et al., 2009; Braet & Van Strien, 1997; Chen & Kennedy, 2005; Chen et al., 2007; Martyn-Nemeth et al., 2009; Nguyen-Rodriguez, Chou, Unger, & Spruijt-Metz, 2008; O’Connor, Jones, Ferguson, Conner, & McMillan, 2008).

With varying levels of stress, people may tend to either decrease or increase their eating in response to the stress (Oliver & Wardle, 1999). When children feel stressed, anxious, or depressed, they tend to eat less because of the natural physiological response (Greeno & Wing, 1994; Zesiewicz, 1992); but, others among them may overeat because the eating behavior provides a sense of gratification when in stressful situations (Lee, 2007). Thus, the relationship between stress and eating behaviors may be influential in affecting the development of some conditions related to diet such as obesity.

Studies examining eating behaviors under stress among children and adolescents have indicated that the amount and quality of an individual’s diet and the eating styles
were likely to get worse and unhealthy when the level of perceived stress increases. For example, research revealed that stress was associated with higher levels of restraint and/or emotional eating styles in children and adolescents in these cross-sectional design studies (Carper, Fisher, & Birch, 2000; Chen et al., 2007; Huang, 2008; Nguyen-Rodriguez et al., 2008). A study of stress and dietary quality of African-American adolescents found that girls, but not boys, tended to make unhealthy dietary choices when under increased stress (Austin et al., 2009). Another investigation of stress and eating behaviors in a socioeconomically and ethnically diverse group of children aged 11-12 years in London, found that greater stress was associated with more unhealthy eating behaviors such as more snacking and greater fatty food intake (Cartwright et al., 2003). Hence, the relationships between stress and these eating styles were explored because academic stress was among the top stressors experienced by children in Asian societies.

**Cognitive appraisal and dispositional optimism/pessimism.** Benign positive cognitive appraisal occurs if the individual has the perception and expectation that the outcome is positive (Lazarus & Folkman, 1984). According to Lazarus and Folkman (1984), challenge and threat appraisals are included in stress appraisals. A challenge appraisal focuses on the potential for gain or growth when encountering difficulties, whereas threat appraisal focuses on anticipating the potential harms or losses, which have not occurred yet, and is related to negative emotions (Lazarus & Folkman, 1984). Additionally, challenge and threat can arise at the same time, and they are not mutually exclusive poles of a single construct (Lazarus & Folkman, 1984). Dispositional optimism is one type of positive cognition (Brewin et al., 1996) that can be described as a general predisposition to appraise cognitively one’s daily stresses in terms of potential growth
and of having a positive outlook on life (Scheier & Carver, 1985). On the other hand, dispositional pessimism is defined as the degree to which an individual expects to experience negative outcomes in life – having a negative future expectation (Scheier & Carver, 1985; Carver & Scheier, 2001). Based on previous successes and failures, a person with optimism tends to accept the reality of stressful and uncontrollable situations and will try to find the best in unfavorable conditions by using problem-focused coping and positive reframing (Burant, 2006; Carver & Scheier, 2005; Scheier & Carver, 2003), while a person with pessimism tends to withdraw from difficulties and use more avoidance coping (Burant, 2006; Scheier, Carver, & Bridges, 2001). A growing body of literature has demonstrated that optimists maintain higher levels of psychological and physical well-being during times of stress than their pessimistic counterparts (Carver, Scheier, & Segerstrom, 2010; Scheier et al., 2001).

Little is known about when and how optimism/pessimism develops in children (Kliewer & Lewis, 1995). Research suggests that children’s optimism/pessimism is established from early childhood experiences, which cultivate trust and secure attachments to parent figures (Ben-Zur, 2003; Carver & Scheier, 1999). In addition, there are a combination of factors that together predispose an individual to think optimistically and pessimistically, such as genetics (Gillham & Reivich 2004; Plomin et al., 1992), life experiences (Korkeila et al., 2004; Roberts, Brown, Johnson, & Reinke, 2005; Scheier & Carver, 1993), and environment (Gillham & Reivich 2004), which includes parenting (Scheier & Carver, 1993; Snyder, 2000) and interactions with peers and other adults (Roberts et al., 2005). Basically, younger children tend to see themselves and others in a more positive way than older persons, who may have become more realistic and practical.
about positivity with increasing age (Schuster, Ruble, & Weinert, 1998).

Most studies have measured dispositional optimism/pessimism on a single continuum. Additionally, the study of optimism/pessimism in children is limited as most studies have focused on adolescents and adults. In studies of adolescents and adults, dispositional optimism has been shown to correlate with their resourcefulness (Brewin et al., 1996) and how they respond to stress and coping (Scheier, Weintraub, & Carver, 1986; Schwarzer, 1994). Research has also shown that optimism can be the most influential cognitive factor in moderating life stressors in adolescents (Tusaie & Patterson, 2006). Studies on academic stress and psychological adjustment among Asian adolescents found that dispositional optimism had a significant negative relationship with academic stress and also mediated the relationships with positive support from parents and peers and psychological adjustment (Chong, Huan, Yeo, & Ang, 2006; Huan, Yeo, Ang, & Chong, 2006). Optimism and pessimism also have different effects on physical health. Oreskovic and Goodman (2012) reported that higher optimism was associated with protective cardiometabolic biomarker profiles in non-Hispanic black adolescents, whereas higher pessimism was related to lower glucose in non-Hispanic whites. Likewise, studies in adolescents and young adults have shown that individuals with higher levels of optimism were associated with greater self-rated physical health than pessimists (Cassidy, 2000; Puskar, Sereika, Lamb, Tusaie-Mumford, & McGuinness, 1999).

As noted by Roberts and Peterson (1984), childhood is the most advantageous time to promote healthy behaviors and prevention of problems from a developmental perspective. In addition, prevention efforts should focus on competency enhancement that “is likely to be most effective when applied during the time of greatest competency
acquisition, which is during childhood for many skills such as language, social abilities, or self-efficacy beliefs” (Peterson & Roberts, 1986, p. 623). Hence, evaluating the challenges in positive ways, rather than focusing on children’s deficits, by using a more affirming and strength-building approach, may facilitate children’s development and enhance their abilities to handle challenges successfully. As proposed by Johnson and Roberts (1999), there is a need to examine the strengths and positive assets of a child at his/her developmental stage; and, this application should be viewed as a process of prevention and promotion (Roberts et al., 2005). Most importantly, this positive point of view enables children to experience empowerment and attempts to enhance their development, functioning, competence, and mental health (Roberts et al., 2005). As recommended by Noll and Kazak (1997), in order to promote positive adaptations while facing overwhelming circumstances, children and their families can be managed in positive ways that encourage them to continuously function to the best of their ability and to facilitate their personal growth by recognizing their own needs and development.

In summary, eating styles reflect the predisposition of how a child eats (Ventura & Birch, 2008) and are related to children’s overweight and/or obesity (Van Strien & Oosterveld, 2008; Ventura & Birch, 2008), although there are some conflicted findings. Research has shown that stress has an indirect influence on an individual’s health through his/her health behavior changes, for instance, changing eating behaviors (Austin et al., 2009; Chen et al., 2007; Huang, 2008; Martyn-Nemeth et al., 2009; Nguyen-Rodriguez et al., 2008; O’Connor et al., 2008). A considerable amount of research on resourcefulness conducted in adults has shown that resourcefulness was an important factor needed for coping with stress (Akgun & Ciarrochi, 2003) and adopting a healthy lifestyle (e.g.
exercise) (Kennett, Worth et al., 2009). Limited research on resourcefulness has been conducted in school-aged children; it has also shown that resourcefulness was associated with improved adaptive functioning (Chang et al., 2007), fewer depressive symptoms (Chang et al., 2007), and lower stress (Hamama et al., 2000; Hamama et al., 2008). Furthermore, a growing body of literature has shown that being optimistic had an important effect on health and health-promoting behaviors and how people responded in times of adversity or challenge (Cassidy, 2000; Puskar et al., 1999; Schwarzer, 1994; Tusaie & Patterson 2006). Hence, from a developmental perspective, childhood is the time of greatest competency attainment, in which promoting healthy behaviors and preventing both physical and mental problems will be effective and beneficial through life (Peterson & Roberts, 1986). In addition, assisting children to face challenges in positive ways should be one of the best approaches to enhance and facilitate their growth and development (Roberts et al., 2005). Because many obese adults experience the onset of obesity in childhood (AAP, n.d.; Dietz, 1994; Freedman et al., 2005), focusing on children’s resourcefulness and childhood eating behaviors casts a new light on these matters. Furthermore, overweight and/or obese children can benefit from learning resourcefulness skills to cope with difficulties to be happier children.

The present study was guided by Rosenbaum’s (1990) theory of learned resourcefulness and Zauszniewski’s (2006) middle-range theory of resourcefulness and QOL: the main goal was to explore the interrelationships among resourcefulness, academic stress, dispositional optimism/pessimism, and eating styles among children in fifth or sixth grades in Taiwan. It is important for nursing professionals to have an empirical understanding of the phenomena by examining the relationships among these
study variables. The comprehensive results are beneficial for both children and their families to establish healthy eating behaviors and to avoid unhealthy ones by using varied problem-solving skills with an optimistic attitude. In addition, recognizing that eating styles could facilitate the tailoring of interventions according to an individual’s or an individual’s family characteristics, the study results provide a sound foundation for future interventional approaches.

Problem

Childhood overweight and obesity is of paramount importance as a global health issue given its increasing prevalence (Vuorela et al., 2009; Wang & Lobstein, 2006; Misra & Khurana, 2008; Yoon et al., 2006). The prevalence of childhood overweight and obesity has shown a marked increase over the past several decades in Taiwan (Chu & Pan, 2007; Pan et al., 2008). According to the comparison of the latest national surveys (NAHSIT Children 1993-1996 and NAHSIT Children 2001-2002) in Taiwan, the prevalence of overweight and obesity has increased approximately from 17.7% to 27.0% between 1993-1996 and 2001-2002 among children aged 6-12 (Chu & Pan, 2007). Similarly, the prevalence of children aged 6-11 who are overweight and obese has also increased from 30.3% to 32.6% between 1999-2000 and 2009-2010 in the US (Ogden, Flegal, Carroll, & Johnson, 2002; Ogden et al., 2012). The rapid increase in the prevalence and the potential health-related consequences of childhood overweight and obesity emphasize the importance of this period in life for the prevention of overweight and obesity and of identifying the factors that influence excess weight gain (AAP, n.d.; Fu, Wen et al., 2008; Van Strien & Oosterveld, 2008). Hence, from the perspectives of health promotion, disease prevention, and children’s growth and development, children
will benefit from learning how to promote healthy behaviors and prevent health problems (Peterson & Roberts, 1986), which may further delay the onset, decrease the complications, and lower the persistence of overweight and obesity (Ventura & Birch, 2008).

Eating styles, as one crucial domain of eating behaviors, are closely related to children’s weight gain and health (Van Strien & Oosterveld, 2008; Ventura & Birch, 2008). Literature has shown that contextual influences such as parents and family, peers, and the environment have direct or indirect effects on children’s health through their eating behaviors (Baranowski, 1997). Research in adults has shown that being resourceful facilitated better coping with stress (Akgun & Ciarrochi, 2003; Zauszniewski & Chung, 2001) and performance of healthy behaviors (Kennett, Worth et al., 2009). In addition, limited research in children has also revealed that greater resourcefulness correlated with lower stress (Hamama et al., 2000; Hamama et al., 2008) and better adaptive functioning (Chang et al., 2007). Although obesity may start in childhood (AAP, n.d.; Freedman et al., 2005) and research about eating behaviors, stress, and resourcefulness exists in children, these variables have not been examined simultaneously. In addition, the examination of relationships among children’s academic stress, dispositional optimism/pessimism, resourcefulness, and eating behaviors can assist health professionals to better understand how these phenomena interrelate in order to inform the design of an effective tailored intervention program to help children and their families establish healthy eating behaviors. The study findings can help to identify how an optimistic disposition and resourcefulness skills contribute to maintaining or regaining normal weight and a healthy lifestyle in fifth- and sixth-grade children.
Figure 1.1. Theoretical substruction diagram.
Purpose

This study had two major aims. The first aim was to explore the interrelationships among resourcefulness, academic stress, dispositional optimism/pessimism, and eating styles of fifth and sixth graders in Taiwan. The second aim was to assess the mediating functions of dispositional optimism/pessimism, academic stress, and/or resourcefulness among the contextual factors, children’s resourcefulness skills, and/or eating styles. Findings of this study further expanded the discussion of resourcefulness in pediatric populations. An empirical understanding of these phenomena could lay a foundation for designing individualized interventions that will benefit children and their families.

Theoretical Framework

The theoretical framework for this study was derived from Rosenbaum’s (1990) theory of learned resourcefulness and Zauszniewski’s (2006) middle-range theory of resourcefulness and QOL. The major constructs, contextual factors, process regulators, self-control behaviors, and target behaviors are presented in Figure 1.1. According to this theoretical diagram, people are able to apply self-control behaviors such as resourcefulness skills to lessen the undesirable effects of contextual factors on target behaviors through various process regulators (Zauszniewski, 2006; Zauszniewski, Bekhet, & Suresky, 2008). To be more specific, contextual factors may influence process regulators and resourcefulness that will further influence target behaviors; process regulators influence resourcefulness and target behaviors; contextual factors have an indirect influence on resourcefulness through process regulators; process regulators have an indirect influence on target behaviors through resourcefulness; and contextual factors have indirect effects on target behaviors through process regulators and resourcefulness.
Hence, it was hypothesized that stressors’ influences can be minimized and eating behaviors will be enhanced if children are resourceful.

**Definitions of Constructs, Concepts, and Variables**

**Contextual factors and intrinsic/extrinsic factors.** As shown in the theoretical substruction diagram (See Figure 1.1), contextual factors, the construct, are the determinants of process regulators (Zauszniewski, 2006). The impact of contextual factors on process regulators and resourcefulness can be either direct or indirect (Zauszniewski, 2006). Rosenbaum (1988, 1990) pointed out that the contextual factors determine the level of pressure an individual would experience and will affect how an individual reacts to those disruptive changes; therefore, contextual influences may impact an individual’s attention and self-evaluation regarding their abilities to cope with those influences. According to Zauszniewski (2006), contextual factors can be either intrinsic or extrinsic; hence, these factors were represented at the conceptual level in this study.

**Intrinsic factors: individual child’s characteristics.** Intrinsic factors, represented at the conceptual level (See Figure 1.1), refer to the factors that are within an individual and may include demographic characteristics (e.g. race, age, and gender), chronic conditions, and daily hassles (Aikens, Wallander, Bell, & Cole, 1992; Edwards & Riordan, 1994; Zauszniewski et al., 2008). In the current study, individual characteristics included the personal information related specifically to the child. Research in different age populations have revealed that these personal characteristics, such as age, gender, race, and BMI, were associated with the person’s perception of stress (Hampel & Petermann, 2005; Huang & Guo, 2009; Leung, Yeung, & Wong, 2010), dispositional optimism/pessimism (Chong et al., 2006; Lemola et al., 2010), resourcefulness (Cawley,
In this study, an individual child’s school performance was examined within the concept of intrinsic factors. School performance has resulted in high demands and great pressure being put on children (Bossy, 2000; Leung et al., 2010). It was reported that academic performance was negatively correlated with children’s weight (Mo-Suwan, Lebel, Puetpaiboon, & Junjana, 1999; Tershakovec, Weller, & Gallagher, 1994). In addition, research indicated that a better academic performance was also linked to children’s healthier eating behaviors, a higher family income, and higher parents’ education levels (Arnold & Doctoroff, 2003; Fu, Cheng, Tu, & Pan, 2007; Kim et al., 2003). However, when taking children’s age into account, the strength of relationship between family income and children’s academic performance was decreased (Kim et al., 2003). Hence, an individual child’s characteristics that included age, gender, BMI, and school performance were examined at the variable level under the concept of intrinsic factors.

**Extrinsic factors: caregivers’ resourcefulness skills, dispositional optimism/pessimism, and eating styles.** Extrinsic factors, represented at the conceptual level, refer to factors that exist within the individual’s environment (Rosenbaum, 1990; Zauszniewski, 2006) such as relocation, social networks, and social support (Bekhet, Zauszniewski, & Wykle, 2008; Dirksen, 2000; Zauszniewski et al., 2005).
Family is the primary social institution influencing children; thus, it is likely that many factors for children’s growth and development have substantial roots within the family context. Parents can influence a child’s growth and development through genetics, parenting styles, and management of family function (Darling & Steinberg, 1993). Parenting has been recognized as an important contextual factor for children’s growth, development, competencies, lifestyles, and well-being (Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000). Studies have indicated that positive and competent parenting promoted children’s self-efficacy, self-control skills, self-discipline, self-regulatory ability, effective coping, and healthy development (Brewin et al., 1996; Duckworth, 2011; Finkenauer, Engels, & Baumeister, 2005; Knoche, Givens, & Sheridan, 2007; Power, 2004; Ronen, 1992; Swanson, Valiente, Lemery-Chalfant, & O’Brien, 2010; Turkel & Tezer, 2008). Proposed by Sanders (1999), parents needed to be independent in solving problems in order to carry out parenting responsibilities; hence, resourcefulness is a crucial element for parents to possess in order to perform practical parenting skills successfully and sufficiently. Kennett, Chislett, and Olver (2012) found that parenting resourcefulness measured by the Parent Resourcefulness Scale (Walker, 1990) was highly related with general resourcefulness, which was measured by Rosenbaum’s (1980) Self-Control Schedule. Since resourcefulness might play an important role in parenting and may have an impact on framing the children’s dispositional optimism/pessimism (Gillham & Reivich 2004; Hasan & Power, 2002; Plomin et al., 1992; Scheier & Carver, 1993; Snyder, 2000), eating styles (Riesch, Anderson, & Krueger, 2006; Ventura & Birch, 2008), and resourcefulness (Preechawong et al., 2007; Rosenbaum, 1980; Turkel & Tezer, 2008; Zauszniewski, Chung et al., 2002), the caregivers’ resourcefulness skills,
dispositional optimism/pessimism, and eating styles were also measured and therefore appeared as extrinsic contextual factors in the theoretical substruction.

Power (2004) suggested that parents had a significant influence on their children’s appraisals to stressful situations through modeling and coaching; in addition, parents increasingly influence their children’s appraisals as they grow. Research has shown that positive parenting was directly related to children’s stress responses (Power, 2004; Valiente, Fabes, Eisenberg, & Spinrad, 2004). For example, poor academic performance may have no real meaning unless one views it in the context of parental standards and expectations. Hence, it is concluded that parental influences on children’s appraisal were among the most important influences in children’s stress and coping (Power, 2004). In this study, caregivers’ resourcefulness skills and dispositional optimism/pessimism were hypothesized to be related to children’s academic stress.

Children’s optimism/pessimism is believed to be developed individually through early childhood experiences within the family context (Ben-Zur, 2003; Carver & Scheier, 1999; Scheier & Carver, 1993). Sahin and associates (2010) emphasized that higher family functioning was related to greater optimism because healthy families teach their children to think positively, solve problems effectively, and communicate directly. It is proposed that parenting was the most influential factor on an individual’s optimism/pessimism (Scheier & Carver, 1993; Snyder, 2000) among factors such as genetics (Gillham & Reivich 2004; Plomin et al., 1992), life experiences (Korkeila et al., 2004; Roberts et al., 2005; Scheier & Carver, 1993), and environment (Gillham & Reivich 2004). Research has found that parenting was associated with children’s optimism/pessimism (Hasan & Power, 2002; Hjelle, Busch, & Warran, 1996); however,
Brewin and associates (1996) stated that parenting and college student’s optimism were not related to each other. Although no study has specifically examined the relationship between caregivers’ and children’s dispositional optimism/pessimism in Taiwan, caregivers’ dispositional optimism was hypothesized to have a positive relationship with children’s dispositional optimism. In addition, to date, no study has directly examined the relationships between caregivers’ resourcefulness and children’s dispositional optimism/pessimism; hence, caregivers’ resourcefulness skills were hypothesized to have a positive relationship with children’s dispositional optimism.

An individual’s resourcefulness, beginning in early childhood, is developed and learned through environmental stimuli such as observation, experiences, and interactions with others (Rosenbaum, 1990; Zauszniewski, 2006); consequently, the level of resourcefulness is individualized because of different demographic backgrounds and learning experiences. It was suggested that children’s resourcefulness was developed within their family context (Preechawong et al., 2007; Rosenbaum, 1980; Turkel & Tezer, 2008; Zauszniewski, Chung et al., 2002). Preechawong and associates (2007) revealed that adolescents who had a higher level of family functioning were more resourceful than their counterparts. Proposed by Gottfredson and Hirschi (1990), an individual’s levels of self-control were determined by parental management styles. Turkel and Tezer (2008) revealed that adolescents who perceived their parents’ parenting as authoritative and indulgent (positive parenting) were more resourceful when compared to those who perceived their parents’ parenting styles as neglectful and authoritarian (negative parenting). One study conducted in the US, which directly examined the relationship between maternal and child’s resourcefulness found that mothers with higher
resourcefulness levels were more likely to have children who had higher resourcefulness levels (Zauszniewski, Chung et al., 2002). Hence, caregivers’ resourcefulness skills were hypothesized to have a relationship with children’s resourcefulness in this study.

Children’s eating styles are one of the risk factors for overweight and obesity (Pan et al., 2008; Van Strien & Oosterveld, 2008; Ventura & Birch, 2008). Parents can influence their children’s eating styles through modeling processes and parenting (Ventura & Birch, 2008). In addition, Rhee (2008) stated that poor family functioning may contribute to the poor development and control of eating behaviors of children with overweight by increasing levels of stress and less supportive healthier lifestyles. Positive parenting was found to be able to prevent poor eating behaviors because children perceive a caring family system (Riesch et al., 2006). Studies found that authoritative parenting (positive parenting) was more likely to decrease children’s emotional eating (Topham et al., 2011) and to promote healthy eating such as having more fruit (Kremers, Brug, De Vries, & Engels, 2003). Furthermore, a study focused on young girls’ eating styles and parental control found that these girls’ restraint and emotional eating styles were related to parenting and parents’ feeding practices such as parental pressure to eat more, and external eating style was related to their parents’ restrictions on their eating (Carper et al., 2000). Another study found that high maternal psychological and behavioral control was related to an increased emotional eating style in adolescents (Snoek, Engels et al., 2007). Likewise, one study found that children whose parents displayed poor parenting styles weighted more than their counterparts (Rhee, Lumeng, Appugliese, Kaciroti, & Bradley, 2006). However, Chen and Kennedy (2004) found that there was a positive relationship between democratic parenting and children’s BMIs in
their study on parenting styles and Chinese children’s weight status. In one of few studies that examined parental behavior and adolescents’ emotional eating, it was found that emotional eating of parents’ and of adolescents’ were positively correlated (Snoek, Engels et al., 2007). To date, no published study has examined the relationships between caregivers’ resourcefulness and eating styles and children’s eating styles in Taiwan. In this study, caregivers’ resourcefulness skills and eating styles were hypothesized to have relationships with children’s eating styles.

In summary, caregivers’ resourcefulness, dispositional optimism/pessimism, and eating styles were examined at the variable level as depicted in this theoretical substruction, and these variables were believed to be theoretically related to children’s academic stress, optimism/pessimism, resourcefulness skills, and eating styles.

**Process regulators, cognitive appraisal, and academic stress and dispositional optimism/pessimism.** Process regulators, the construct as shown in the theoretical substruction diagram (See Figure 1.1), are cognitive processes that provide mechanisms for the individuals to evaluate situations they face (Rosenbaum, 1990). According to Zauszniewski and colleagues (2008), process regulators are the intervening variables that may be influenced by contextual factors and have direct effects on resourcefulness. In addition, process regulators are the cognitive processes that are “under the voluntary control” of the person (Rosenbaum, 1990, p. 5).

Cognitive appraisal, a process regulator at the conceptual level, is defined as “the process through which the person evaluates whether a particular encounter with the environment is relevant to his or her well-being and, if so, in what ways” (Folkman et al., 1986, p.993). There are two forms of cognitive appraisal, primary and secondary
(Lazarus & Folkman, 1984). During the primary cognitive appraisal process, people evaluate whether a situation’s significance or meaning is irrelevant, benign positive, or stressful; during the secondary cognitive appraisal, people assess their abilities to meet with the demands (Lazarus & Folkman, 1984). Based on Lazarus and Folkman’s (1984) work, benign positive cognitive appraisal occurs when individuals perceive the outcome of the encounter to be positive thus enhancing and preserving well-being. As proposed by Bandura (1977, 1982), individuals develop expectations during secondary appraisal for outcome and self-efficacy. Outcome expectancy refers to an individual’s belief in obtaining a desired goal if specified actions are performed; and, self-efficacy expectancy refers to an individual’s self-evaluation regarding specific capabilities for performing essential behaviors to attain the desired goal (Bandura, 1977, 1982).

Academic stress represented at the variable level is treated under the domain of cognitive appraisal (See Figure 1.1). Defined by Lazarus and Folkman (1984, p. 19), stress is “a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being.” Compared to adults, research on stress in childhood is limited (Ryan-Wenger et al., 2005). School-aged children have been found to be able to identify the stressors in their lives if they are being asked (Sharrer & Ryan-Wenger, 2002). Children may be exposed to stressful situations from parents and family, peers, and environment (Baranowski, 1997). Stress, such as academic stress, has been found to be one of the major sources of stress in children (Hampel & Petermann, 2005; Hasan & Power, 2004; Lau, 2002; M. Wu, 2006). Most Chinese and Asian parents have high expectations regarding their children’s academic achievement (Leung et al., 2010; Roopnarine et al.,
2003; Yang, 2007); consequently, these expectations may put additional, great pressure on children (Bossy, 2000). Hence, academic stress represented a cognitive appraisal at the variable level and was conceptualized as “a disturbance induced by a student’s appraisal of academic stressors” (Leung et al., 2010, p. 90).

Dispositional optimism/pessimism is represented at the variable level (See Figure 1.1). Dispositional optimism/pessimism is believed to be developed through past experiences and challenges (Ben-Zur, 2003; Carver & Scheier, 1999; Gillham & Reivich 2004; Korkeila et al., 2004; Roberts et al., 2005; Scheier & Carver, 1993). Based on successfully handling previous challenges (Burant, 2006; Scheier & Carver, 1993, 2003), dispositional optimism refers to the individual who has a general predisposition to appraise cognitively his or her daily stresses or difficulties in terms of potential growth and of a positive outlook on life (Costello et al., 2002; Scheier & Carver, 1985), to choose the coping strategies (Carver, Scheier, & Weintraub, 1989; Scheier et al., 1986), and to initiate the preventive behaviors (Schwarzer, 1994). In contrast, dispositional pessimism refers to the individual who has a general predisposition to appraise cognitively his or her difficulties in terms of a negative outlook on life because of previous failures (Burant, 2006; Scheier & Carver, 1985; Carver & Scheier, 2001) and to choose avoidance coping strategies (Burant, 2006; Scheier et al., 2001). In other words, being optimistic or pessimistic influences how an individual adjusts to daily events and what his/her subjective experiences are when facing challenges and dealing with problems; moreover, unlike a pessimistic individual, an optimistic person tends to accept the reality of stressful and uncontrollable situations, seeks for the best in worst conditions,
and tries to learn from them (Carver & Scheier, 2005). Hence, dispositional optimism/pessimism was examined at the variable level.

**Self-control behavior, resourcefulness, and resourcefulness skills.** Self-control behavior, the third construct as shown in Figure 1.1, is cognitively influenced by the person’s process regulators and developed in response to disruptions during the process of performing behaviors directed toward his/her goal (Rosenbaum, 1990). According to Rosenbaum (1990), self-control is a process that individuals will need to determine their behaviors and adopt effective ways for controlling their cognitions, emotions, and behaviors. Self-control behavior represents the ability and belief of coping independently with deleterious disruptions in life by using a collection of cognitive-behavioral strategies (Rosenbaum, 1990). There are two types of self-control behaviors, redressive and reformative; these self-control behaviors function in competition or conjunction with each other (Rosenbaum, 1990; Zauszniewski, 2006). According to Rosenbaum (1990, p. 12), with redressive self-control, “the person’s efforts are directed at resuming normal functioning that was disrupted;” whereas reformative self-control indicates “the person’s efforts are directed at disrupting his or her customary way of functioning and adopting a new behavior.” Both cognitive and behavioral efforts are required to respond to unfamiliar or stressful situations.

Self-control is needed when facing obstacles in performing goal-directed behaviors (Ronen & Rosenbaum, 2001). Children are born without self-control but acquire it gradually as they grow up; as children grow, children show increasing awareness of the strategies that facilitate various types of self-control (Kendall & Braswell, 1985; Ronen, 1992). As Kopp (1982) stated, children acquired self-control that
included the ability to delay or wait for acts or activities upon request and begin to regulate behaviors by 24 months of age. In other words, once children acquired self-control they would be capable of overcoming difficulties, delaying immediate gratification, controlling their behaviors, and gaining a sense of self-efficacy (Kendall & Braswell, 1985; Hamama et al., 2000). Moffitt and associates (2011) indicated that childhood self-control predicted a wide range of consequential later life conditions such as better physical and mental health and fewer bad behaviors.

Resourcefulness is essential for the execution of self-control behaviors (Rosenbaum, 1990) so resourcefulness was treated as a concept at the conceptual level of self-control behaviors (See Figure 1.1). Rosenbaum (1990) noted that individuals need to possess certain beliefs, skills and behaviors to perform redressive and reformatory self-control behaviors in order to cope with stressful situations successfully; therefore, resourcefulness is defined as consisting of a collection of behaviors and cognitive skills that enable individuals to deal with the potentially disturbing effects of internal processes which include thoughts, sensations, and feelings in order to achieve, maintain, or regain effectively (Rosenbaum, 1990; Zauszniewski, 2006). In addition, resourcefulness varies individually and is an effective coping mechanism that a person becomes skilled at through modeling, conditioning, and/or receiving instructions (Rosenbaum, 1990).

Since multifaceted resourcefulness skills are required for behavioral change, resourcefulness skills were examined at the variable level. By definition, resourcefulness consists of a collection of both cognitive and behavioral skills (Rosenbaum, 1990); hence, the cognitive-behavioral collection includes cognitions and self-instructions for managing emotional and physiological reactions, problem-solving strategies and abilities for
delaying immediate gratification of needs, and beliefs in one’s ability to effectively cope with internal processes (Rosenbaum, 1990).

**Target behavior, eating behaviors, and eating styles in children.** At the construct level (See Figure 1.1), target behavior is the consequence of the self-control process and referred to as health related behaviors (Rosenbaum, 1990). In the present study, eating behaviors represented the target behavior at the conceptual level.

Eating behaviors are associated with children’s weight status (Van Strien & Oosterveld, 2008; Ventura & Birch, 2008) although the findings are conflicted. Comprehensive children’s eating behaviors include three different dimensions: eating styles, food preferences, and dietary intake (Ventura & Birch, 2008). This study focused on how a child eats in different situations, which was reflected in their eating style (Ventura & Birch, 2008).

Eating styles represented the target behaviors at the variable level and was defined as “specific aspects of how a child eats” (Ventura & Birch, 2008, “Eating Style Food Preferences,” para. 1). Three eating styles have been identified that are associated with weight gain (Van Strien & Oosterveld, 2008). They are emotional, external, and restrained eating, and are derived from psychosomatic theory, externality theory, and restraint theory, respectively (Van Strien & Oosterveld, 2008). As concluded by Van Strien (2000), emotional eating has been found to be the most important determinant among the problematic eating styles for increased food consumption; emotional eating happens in response to negative emotions and will reduce psychological distress and anxiety (Ganley, 1989; Van Strien & Oosterveld, 2008; Van Strien & Ouwens, 2003; Van Strien et al., 1986). External eating refers to an eating style in which eating is in response
to the food-related stimuli such as smell and taste of food (Schachter & Rodin, 1974).
The restrained eating style proposes that overeating is a consequence of unsuccessful
dieting because dieting may be easily discarded when self-control is inhibited by stress,
anxiety, or depression (Van Strien & Ouwens, 2003).

Hypothesized relationships at the theoretical level among contextual factors,
process regulators, self-control behavior, and target behavior were derived from
Rosenbaum’s (1990) theory of learned resourcefulness and Zauszniewski’s (2006)
middle-range theory of resourcefulness and QOL. Figure 1.2 and Figure 1.3 represent the
proposed study models that describe the hypothesized relationships in this study.
Contextual factors, intrinsic or extrinsic, will have an influence on process regulators
(See path A in Figure 1.2) and self-control behavior (See path B in Figure 1.2), which
will further affect target behavior (See path C in Figure 1.2) (Rosenbaum, 1990;
Zauszniewski, 2006). At the conceptual level (See Figure 1.1), the hypothesized
relationships derived from empirical evidence, Rosenbaum’s (1990) theory of learned
resourcefulness, and Zauszniewski’s (2006) middle-range theory of resourcefulness and
QOL are described as follows. Intrinsic or extrinsic factors have a direct influence on

cognitive appraisal (See path A in Figure 1.2), resourcefulness (See path B in Figure 1.2),
and eating behaviors (See path C in Figure 1.2). Moreover, intrinsic or extrinsic factors
have an indirect influence on resourcefulness through cognitive appraisal, and intrinsic or
extrinsic factors will have an indirect influence on eating behaviors through process
regulators and resourcefulness (See Figure 1.3). At the variable level (See Figure 1.1), it
is hypothesized that children’s individual characteristics and/or caregivers’
resourcefulness skills, dispositional optimism/pessimism, and/or eating styles will have
effects on children’s academic stress and/or dispositional optimism/pessimism (See path A in Figure 1.2), which in turn will have effects on children’s resourcefulness skills and ultimately will have effects on their eating styles. Hence, in this study hypothesized that children who have higher scores on the instrument measuring resourcefulness and lower scores with regard to academic stress as well as higher scores on dispositional optimism are expected to have positive relationships with eating styles.

**Research Questions**

This study addressed the following major research questions (RQs) among fifth and sixth graders in Taiwan (See Figures 1.2 and 1.3).

1. Are intrinsic (children’s age, gender, BMI, satiety responsiveness, and hunger/satiety cues) and extrinsic (caregivers’ resourcefulness, dispositional optimism/pessimism, and eating styles – emotional, external, and restrained) contextual factors associated with process regulators (academic stress and dispositional optimism/pessimism)?

2. Are intrinsic (children’s age, gender, BMI, satiety responsiveness, and hunger/satiety cues) and extrinsic (caregivers’ resourcefulness, dispositional optimism/pessimism, and eating styles – emotional, external, and restrained) contextual factors associated with self-control behavior (children’s resourcefulness skills)?

3. Are intrinsic (children’s age, gender, BMI, satiety responsiveness, and hunger/satiety cues) and extrinsic (caregivers’ resourcefulness, dispositional optimism/pessimism, and eating styles – emotional, external, and restrained) contextual factors associated with target behavior (children’s eating styles – emotional, external, and restrained)?

4. What are the strengths and directions of the relationships between process regulators (academic stress and dispositional optimism/pessimism) and the self-control behavior
5. What are the strengths and directions of the relationships between process regulators (academic stress and dispositional optimism/pessimism) and the target behavior (children’s eating styles – emotional, external, and restrained)?

6. What is the strength and direction of the relationship between self-control behavior (children’s resourcefulness skills) and the target behavior (children’s eating styles – emotional, external, and restrained Eating)?

7. While controlling for covariates, how do process regulators (academic stress and dispositional optimism/pessimism) mediate intrinsic (children’s age, gender, BMI, satiety responsiveness, and hunger/satiety cues) and extrinsic (caregivers’ resourcefulness, dispositional optimism/pessimism, and eating styles – emotional, external, and restrained) contextual factors on self-control behavior (children’s resourcefulness skills)?

8. How does self-control behavior (children’s resourcefulness skills) mediate process regulators (academic stress and dispositional optimism/pessimism) on target behavior (children’s eating styles – emotional, external, and restrained)?

9. While controlling for covariates, how do process regulators (academic stress and dispositional optimism/pessimism) and self-control behavior (children’s resourcefulness skills) mediate intrinsic (children’s age, gender, BMI, satiety responsiveness, and hunger/satiety cues) and extrinsic (caregivers’ resourcefulness, dispositional optimism/pessimism, and eating styles – emotional, external, and restrained) contextual factors on target behavior (children’s eating styles – emotional, external, and restrained)?
Contextual Factors

Intrinsic
- Age
- Gender
- BMI
- Hunger/Satiety
  - Satiety Responsiveness
  - Hunger/Satiety Cues
- School Performance
- Chronic Condition(s)
- Chronic Medication(s)

Extrinsic (Caregiver)
- Age
- Gender
- BMI
- Education
- Family Income
- Resourcefulness Skills
- Dispositional
  - Optimism/Pessimism
- Eating Styles
  - Emotional Eating
  - External Eating
  - Restrained Eating

Process Regulators
- Academic Stress
- Dispositional Optimism/Pessimism

Children’s Self-Control Behavior
- Resourcefulness Skills

Target Behaviors
- Eating Styles
- Emotional Eating
- External Eating
- Restrained Eating

RQ#1 (A)
RQ#2 (B)
RQ#3 (C)
RQ#4
RQ#5
RQ#6

Figure 1.2. Proposed study model (RQ #1 – RQ #6). a = covariate.
**Figure 1.3.** Proposed mediation study model (RQ #7 – RQ #9). a = covariate.
CHAPTER 2: REVIEW OF THE LITERATURE

Introduction

The current study was guided by Rosenbaum’s (1990) theory of learned resourcefulness and Zauszniewski’s (2006) middle-range theory of resourcefulness and QOL. This chapter starts with an emphasis on children as major study participants and an overview of their weight status. Following is an integrative review of literature that includes theories of concepts such as eating styles, academic stress, resourcefulness, and dispositional optimism/pessimism. Finally, the interrelationships among the concepts will also be examined. This review of literature is presented in seven sections: (a) children as major study participants; (b) overview of children’s weight status; (c) children’s eating behaviors and eating styles; (d) overview of stress, cognitive appraisals, and coping in children; (e) self-control behaviors and resourcefulness; (f) dispositional optimism/pessimism; and (g) theoretical and empirical linkages among these variables.

Children as Major Study Participants

No matter what their backgrounds are, the health of children is a resource for many future aspects of development in all countries. Early investment in the health of children is imperative because many diseases can be prevented with health-promoting programs implemented effectively during the early stages of life in order to create a better society in the future (Barnekow & Muijen, 2009).

Listening to children is important when recognizing and respecting their worth as human beings. It is vital to get children’s views from their own perspectives, although assessing young children’s eating-related problems and social-emotional situations may bring some methodological issues because of their limited cognitive ability; plus they are
often not able to provide reliable responses (Borgers & Hox, 2001; Denham et al., 2009; Wigelsworth et al., 2010). The questionnaire approach has its difficulties as well because it relies on the cognitive ability of the subject to recall information accurately. Consequently, primary caregivers are usually the most important source of information in these cases (Wigelsworth et al., 2010).

Researchers noted that there are advantages when using children as the major respondents (Borgers, de Leeuw, & Hox, 2000; Wigelsworth et al., 2010). For example, children will have access to their information and also information about other respondents, including their parents or peers. Likewise, Spencer and Flin (1990) suggested that children are actually more reliable than previously considered, and reliability can be increased by skillful interviewing and effective strategies. Strategies in survey studies may include giving the child unambiguous and comprehensible instructions, and explicitly permitting “don’t know” responses to avoid best guesses (Spencer & Flin, 1990). In addition, research has noted that older children and adolescents are more likely to be accurate respondents than younger children, especially for self-report measures because they are capable of providing meaningful and insightful information (Denham et al., 2009; Wigelsworth et al., 2010). In fact, children who are 10-12 years old are found to be more reliable respondents than adolescents because children are usually more motivated (Frank, 1991; Frank et al., 1977). Therefore, this present study focused on children who are 10-12 years of age (grades five-six).

According to Snyder and Lopez (2007), prevention has two categories, primary and secondary. Primary prevention means to eliminate or remove physical or psychological problems before they occur, whereas secondary prevention tries to lessen
problems after they have actually appeared (Snyder & Lopez, 2007). Gillham et al. (1995) implemented a primary prevention program to help fifth and sixth graders to identify negative beliefs and change their attributions to be more optimistic; they found depressive symptoms were lower in groups of prevention program. Seligman, Reivich, Jaycox, and Gillham (1996) introduced their secondary prevention program to teachers and parents and showed them how to instruct children in obtaining the necessary life skills in order to control their depression; they found their program improved children’s school performance and physical health. It is concluded that both primary and secondary preventions are effective and beneficial to enhance quality of life.

From the developmental perspective, the most advantageous time in human life to promote healthy behaviors and prevent problems is during childhood (Roberts & Peterson, 1984). Moreover, Peterson and Roberts (1986) emphasized that putting efforts on enhancing children’s competency is the most effective way to promote health prevention because childhood is a period when children gain competency in areas such as language, social abilities, and self-efficacy beliefs. In addition, Roberts and associates (2005) proposed using a strength-building approach to understand a child’s challenges and assets, which should enhance a child’s development and help prevent complications in the future.

In summary, the uniqueness of research that focuses on children includes the impact on the child’s current functioning and the potential to improve their future health status (Maddux, Roberts, Sledden, & Wright, 1986). More specifically, prevention and promotion efforts will not only improve the quality of life for children and their families during childhood but also later on in life, into adulthood. Thus, from the perspectives of
disease prevention, health promotion, and children’s development, nursing as a health profession should focus on putting children on a healthy track at the early ages of their lives instead of reacting to those children who are already overweight and obese.

**Growth and Development of Children in Fifth and Sixth Graders**

“Children”, a general term, usually refers to humans 12 years and under (Steinberg, Bornstein, Vandell, & Rock, 2011). Fifth and sixth graders generally fall into the category of later childhood (ages 9-12 years) (Strom, Bernard, & Strom, 1987) or preadolescence (Perkins, 1974). According to Havighurst (1953), older children or preadolescents are substantially different from children at earlier stages (e.g. 0-6 years) because they begin to move from parental controls to be influenced by the peer group; there is a physical thrust into the world of games and work, and there is a mental thrust into the world of concepts, problems, and communication. Unlike younger children, older children or preadolescents become “increasingly responsible for the stress they experience” (Strom et al., 1987, p. 212).

**Physical development – body growth.** The late school-age period (children in fifth and sixth grades) is the time when children are unconsciously preparing for their adolescent growth spurt, and body proportions are changing. There is a tendency for many children at this time between childhood and adolescence to have an increase in body fat (Dietz, 1994; 2004). Girls may have more body fat, whereas boys have more lean body mass per inch of height (Steinberg et al., 2011). According to the survey conducted in 2005 (Department of Physical Education, Ministry of Education, Republic of China [Taiwan], 2007), on average, school-age children in Taiwan gained approximately 5-6 centimeters and 3-5 kilograms per year; at the fifth grade, the average
Taiwanese boy was 140.9 centimeters (55.5") tall and weighed 39.24 kilograms (87 pounds), whereas the average girl was 142.4 centimeters tall (56") and weighed 35.8 kilograms (79 pounds). In accordance with the National Health and Nutrition Examination Survey (NHANES) (1999-2002) in U.S., the average boy is 58.5" tall and weighs 96.2 pounds, whereas the average girl is 59.6" tall and weighs 105.4 pounds at the age of 11 years (Ogden, Fryar, Carroll, & Flegal, 2004).

As children are steadily growing with considerable variations in their anthropometric parameters, which are age- and gender-dependent, the variations of anthropometric parameters will need to be taken into consideration when establishing clinical criteria of overweight or obesity for children. One way to measure a child’s physical development is by the BMI, which correlates well with the percentage of body fat in large populations (Pietrobelli et al., 1998; Visscher, Snijder, & Seidell, 2010). It also helps health professionals and caregivers judge whether a child’s weight is appropriate for his or her height (Must & Anderson, 2010; Steinberg et al., 2011). BMI is a well-recognized and non-invasive measure to determine overweight and obesity, and is simple to use and calculated by dividing weight (measured in kilograms) by height (measured in meters) squared (Visscher et al., 2010). A child in the 60th percentile for BMI is heavier than 60 percent but lighter than 40 percent of children for his or her age, gender, and height. Children in the age- and gender-specific 85th to 94th percentiles are considered overweight and those in the 95th percentile or higher are obese (Food and Drug Administration, Department of Health, Executive Yuan, Republic of China [Taiwan], 2010). Although heredity is a key factor contributing to children’s overweight
and obesity, changes in diet and physical health have resulted in increases in height and weight within families worldwide (Steinberg et al., 2011).

Childhood, especially during fifth and sixth grade, is an important time in early adolescence during which the risk of onset, complications, and persistence of overweight and obesity increases (Dietz, 2004). A longitudinal study aimed to examine the prospective association of early overweight and pubertal maturation found that increasing BMI and overweight at 5 years of age predicted the advanced stages of puberty; in addition, an advanced stage of puberty predicted young adults’ BMI and overweight status at 21 years (Mamun, Hayatbakhsh, O’Callaghan, Williams, & Najman, 2009). Moreover, rapid weight gain during the transition into adolescence is prognostic of poor health outcomes in adulthood (Baker et al., 2007; Barker et al., 2005; Bhargava et al., 2004; Dietz, 2004). Hence, it is important to investigate a child’s eating styles and other study variables in this period since children are given more autonomy on what to eat (Steinberg et al., 2011).

Cognitive development. Cognitive systems are designed for gaining knowledge and additional skills (Boekaerts, 1993). Piaget’s (1897-1980) cognitive developmental theory is one of the most significant theories in developmental psychology. Slee and Shute (2003) use Piaget’s idea about a child’s mind; it is not a blank sheet. A child is actively involved in development, has a multitude of ideas about the world, and keeps learning about the world (Slee & Shute, 2003). Furthermore, cognitive development is progressive and directional whereby the process is moved to a more mature level of qualitatively different functioning (Slee & Shute, 2003).
Piaget’s theory has the characteristics of stage-independent components (Slee & Shute, 2003). Piaget proposed that cognitive development proceeds in qualitatively different stages based on the types of mental representations of construction and the mental processing during that specific period (Steinberg et al., 2011). For example, the sensori-motor period occurs before the age of two; here infants learn through sensory experience (Slee & Shute, 2003). As children grow, they develop from qualitatively different cognition into different stages. Roughly between ages 7 and 11 years is called the concrete operations period, in which children have a greater cognitive flexibility such as having the concept of conversation, grouping of ideas, and starting logical deductive reasoning about the concrete world they have experienced (Bronson, 2000; Steinberg et al., 2011). The formal operations period begins around the age of 11 and 12 years. Here, a child’s mental capacity is close to an adult’s. Children become capable of systematic reasoning, propositional logic, and thinking hypothetically and abstractly about the world without relying upon concrete situations they have never experienced (Slee & Shute, 2003; Steinberg et al., 2011).

To sum up, children become increasingly independent during the school-age period, and they can wash and dress themselves, make their own snacks, and find their way around the neighborhood; in addition, their thinking becomes more logical as they categorize and organize material in ways that enable them to process increasing amounts of information faster, and their knowledge of the world beyond their immediate experience expands from school and home to the media (Steinberg et al., 2011).

Socioemotional development. The advances in the physical and cognitive domains (as described above) help set the stage for a child’s socioemotional development.
The child at this period is able to consider multiple concepts or dimensions at the same time, which means s/he can compare his/her ideal and real self as well as compare selves to others; thus, the concept of self becomes more multifaceted as they reflect the views of their caregivers, peers, and societal standards (Steinberg et al., 2011). Children with more positive self-appraisals are more likely to have caregivers who are involved in their lives and activities (Harter, 2006). Likewise, children’s self-concepts also reflect gender norms, which provide an organizing framework for children to think about themselves in relation to others (Steinberg et al., 2011).

The family is an overarching system of relationships composed of interrelated subsystems that have implications for a child’s development (Steinberg et al., 2011). During the school-aged period, parent-child interaction changes from more parental control to co-regulation because a child’s cognitive and social skills are more advanced and require parents to adjust (Russell, Mize, & Bissaker, 2002). Parenting is fairly regular and consistent and is centered on parental concerns (Levine & Munsch, 2011). Insensitive parenting is a risk factor for long-term difficulties in a child’s adjustment (Repetti, Flook, & Sperling, 2011). A growing body of research has documented that positive parenting styles were linked to children’s competence, adjustment, responsibility-taking, academic achievement, and healthy emotion regulation (Levine & Munsch, 2011; Repetti et al., 2011; Steinberg et al., 2011).

**Self-regulation.** Self-regulation and self-control are usually used interchangeably in literature because the definition of self-regulation in health psychology is close to the view of self-control in the strength model (Baumeister, Vohs, & Tice, 2007; Hagger, Wood, Stiff, & Chatzisarantis, 2009). However, self-regulation should be viewed as a
broad and global term that refers to all aspects of regulation (Baumeister et al., 2007), whereas self-control is regarded as the process in which an individual acquires specific abilities and skills to deliver control over outcomes and attain goals (Carver & Scheier, 2011). Both self-regulation and self-control are needed for an individual to adopt healthy behaviors and cope with stress (Eisenberg, Fabes, & Guthrie, 1997; Ronen, Rahav, & Wozner, 1995; Thayer, 2001). To be clearer, self-regulation is a vital capacity throughout one’s whole lifespan, and it is the individual’s ability to regulate his or her thoughts, feelings, and behaviors that contributes to psychological health and well-being (Carver & Scheier, 1999). In order to self-regulate, individuals must delay short-term gratification in favor of long-term goals and overcome a multitude of barriers, temptations, and impulses likely to undermine the goal-directed behavior (Mettealfe & Mischel, 1999).

Karoly (1993) defined self-regulation as “those processes, internal and/or transactional, that enable an individual to guide his/her goal-directed activities over time and across changing circumstances (contexts)” (p. 25). According to this definition, regulation indicates “modulation of thought, affect, behavior, or attention via deliberate or automated use of specific mechanisms and supportive meta skills” (Karoly, 1993, p. 25). In addition, Karoly (1993) proposed that the processes of self-regulation are initiated when routinized activity is hindered or when goal directedness has otherwise become salient. Hence, when people cope with stress by acting overly aggressively or by inhibiting any form of obvious expression, this reveals the absence of sufficient self-regulation and self-control (Eisenberg et al., 1997). Children’s self-regulation often refers to how children learn to guide or manage their own behavior or emotions when dominant responses do not apply (Aldwin, Skinner, Zimmer-Gembeck, & Taylor, 2011).
Early self-regulation is primarily reactive, together with external events and internal biological requirements and reflexes which set the stage for organizing, modifying, and regulating responses (Bronson, 2000). For example, a research on infants’ self-regulation found that infants’ developing ability to regulate emotion was a consequence of developmental changes in reflex adaption and social interactive skills, which was relevant to a developmental perspective on the origins of coping skills (Thompson, 1994).

People have mixed self-regulation mechanisms because the development of self-regulation is multifaceted and interrelated. For example, physical maturation and sensory-motor development affect the possible types of physical activity, social interaction, and cognitive problem-solving a child can attempt; on the other hand, physical activity, social interaction, and cognitive abilities influence a child’s physical and sensory-motor development. Cognitive stimulation for developing problem-solving strategies is further mediated through language development and culture (Bronson, 2000). Eventually, people are able to direct external behavior and internal thought processes and influence the social and physical environment successfully.

Most theories view the mechanisms that mediate self-regulation and how self-regulation is developed during early childhood (Bronson, 2000). For instance, Piaget suggested that self-regulation is an innate property of human cognitive adaptation; in Piaget’s equilibration model of cognitive adaptation, development occurs because of processes of assimilation and accommodation, which are automatically self-regulating (Piaget, 1952 as cited in Bronson, 2000). As children actively interact with the
environment, information from these interactions and processes is consistent with existing mental structures, which cause mental equilibrium (Bronson, 2000).

Behavioral theorists view self-regulation as learned self-control and focus on the ways that the external environment controls the behavior of individuals. Research has documented the consequences of behavior, which are important influencing factors to shape the direction and frequency of future self-regulatory behaviors (Bronson, 2000). Self-regulation includes goal setting, self-instructions, self-monitoring, and self-reinforcement (Bronson, 2000). Hence, children will learn to wait for delayed gratification, assess the relative value of a variety of rewards, choose appropriate goals, give themselves effective instructions to guide behaviors and problem-solving, monitor their own activities, and follow instructions. From the perspective of behavioral theorists, individual variation exists in self-regulation. Self-regulation changes with age and experience because developing self-regulation is a learning process that may occur as a result of everyday experience in one’s environment (Steinberg et al., 2011).

Self-regulation refers to the development of appropriate emotional and behavioral control (Carver & Scheier, 2011). Developing appropriate emotional and behavioral control is important in areas related to social competence, peer acceptance, school success, and life adjustment (Mischel & Ayduk, 2011; Steinberg et al., 2011). This control over emotions and behaviors changes with age and experience (Bronson, 2000; Steinberg et al., 2011). During the first few months of life, infants begin to adapt their innate regulatory systems to their environment and develop internal control mechanisms that allow self-directed voluntary control of arousal (Bronson, 2000). True voluntary control begins between 12 to 24 months and the emergence of self-control between 24 to
35 months (Bronson, 2000). During these periods, children begin to understand external constraints and are more interested in exercising control through their behaviors (Bronson, 2000). During preschool age, children can guide their behavior internally and begin using language to help understand emotions and problem situations, and negotiate and resolve problems; in addition, there is a gradual shift from external to internal control at this period (Bronson, 2000). Primary school children have better attention control, they can guide their behavior through internalized language, and they reflect more on their actions and feelings (Bronson, 2000; Vygotsky, 1987).

Causal attribution and perceived psychological control are two key factors of self-regulation in the view of social cognitive theorists (Bronson, 2000). Beliefs about the source of control in one’s environment are an important element of the causal inference process, which has been documented to have an effect on expectations for behaviors, emotions, and outcomes (Bronson, 2000). Furthermore, Bandura (1997) proposed that the development of self-regulation in children requires the development of expectancies for the outcomes of behavior and performance standards for self-evaluation that are appropriate to the child’s age, abilities, and level of experience. Hence, self-regulation is adaptive in a situation that depends on the appropriateness of the child’s expectancies for the outcomes of behavior (Bronson, 2000). In other words, the perception of self-efficacy (Bandura, 1997) motivates self-regulatory behavior.

From the social learning theoretical point of view, children learn to regulate internally by drives and habits, and externally by the reward contingencies of the environment (Bronson, 2000). Likewise, behaviors such as self-directed learning, problem-solving, and action occur only when the ability to control thinking or behavior is
accompanied by motivation, which may be vulnerable to environmental influences (Bronson, 2000). For example, Zimmerman (1998) pointed out that self-regulated learners were those who use cognitive strategies to accomplish academic tasks. High-achieving children were more likely to have a higher degree of self-regulation in their learning (Zimmerman & Schunk, 1989). Research has documented that self-regulated children appeared different from others by their goal-setting, accurate self-monitoring, perceived self-efficacy, help-seeking, and resourcefulness when thinking strategically (Schunk, 1990). Moreover, Vygotsky (1987) stated language was the most important tool for self-regulation in situations when children talked to themselves out loud while they worked on tasks that exceeded their abilities. Hence, self-regulation increased when verbalization was directed toward the self and became more internalized (Vygotsky, 1987). According to Zimmerman (1995), developing self-regulation in school-aged children increased from grades four and five. This was because children were required to be more responsible for their homework, reading content, and other complicated academic activities. In the learning context, self-regulation involved a multidimensional process, which included personal (cognition and emotion), behavioral, and contextual elements (Zimmerman, 1989).

Children become capable of proactive and conscious control with maturation and experiences, which includes both mental and environmental support and guidance from parents and others (Bronson, 2000). Caregivers’ responsive guidance and support are important for children’s self-regulation development; furthermore, caregivers’ interpersonal strategies and styles of interaction also provide models for children to internalize and imitate (Bronson, 2000). Thus, a child’s emotional and behavioral self-
regulation will benefit from consistent, supportive, responsive, and positive parenting behaviors (Karreman, Van Tuijl, Van Aken, & Dekovic, 2006).

Self-regulation is beneficial not only for the individual but also for society. Benefits of self-regulation to society include controlling monetary spending, performing well in school, and refraining from aggressive behaviors. Consequently, it is obvious that the costs of poor self-regulation are high, and improved self-regulation can prevent and reduce numerous social problems (Gailliot, Mead, & Baumeister, 2008). Therefore, putting self-regulation in practical applications is critical, and researchers and educators are interested in promoting self-regulation, enhancing motivation, and establishing a supportive and multifaceted environment for self-control and self-directed learning.

**Summary**

Children in fifth and sixth grades are in a period of development spotted by dramatic changes in physical maturity, cognitive abilities, and social relationships. Their energy needs differ as a function of rate of growth, and the timing of growth spurts differs for girls and boys. Healthy development during this period is also marked by an increasing level of self-regulation and self-control such that children are able to regulate their emotional and behavioral responses to meet environmental demands and engage in goal-oriented activities. It seems that children play an increasingly active role in selecting and shaping their environments; they are still greatly influenced by their parents and families such as parenting practices. What children learn from family has far-reaching implications for their functioning in multiple domains, including physical, psychological, socioemotional health, and school adjustment (Repetti et al., 2011). Although assessing children’s behavioral problems may have some methodological and practical issues, it is
imperative to get children’s views from their perspectives. Hence, it is necessary to consider individual variability such as issues related to their growth and developmental aspects as well as research methodology in order to promote both children’s and their families’ quality of life.

Overview of Children’s Weight Status

Child’s Weight Status: Childhood Overweight and Obesity

BMI is strongly correlated with adiposity and is used for assessment of obesity in children and adolescents (Must & Anderson, 2010; Visscher et al., 2010). Childhood overweight is defined as a BMI at or above the 85th BMI-for-age percentile and lower than the 95th percentile, and obesity is defined as a BMI at or above the 95th percentile (Food and Drug Administration, Department of Health, Executive Yuan, Republic of China [Taiwan], 2010). The prevalence of childhood overweight and obesity has increased dramatically. Overweight and obesity affected approximately 27% of children aged 6-12 in Taiwan in the period from 2001 through 2002 (Chu & Pan, 2007).

According to the Nutrition and Health Surveys in Taiwan (NAHSIT) conducted among elementary school children, the prevalence of overweight and obesity in children has increased over 50% between 1993-1996 and 2001-2002; in addition, the prevalence was higher in boys (Chu & Pan, 2007).

This rising prevalence is of concern because overweight children have an increased risk of adult obesity and chronic diseases. Overweight in childhood tends to persist into adulthood (AAP, n.d.; Dietz & Robinson, 2005; Freedman et al., 2005; Kindblom et al., 2009). A cohort study on comparing childhood levels of BMI and triceps’ skinfold thickness between 1973 and 1996, among 2,610 subjects, found that children
aged 2 to 5 whose BMI-for-age was greater than the 95th percentile were 4 times more likely to become overweight in their adulthood when compared to children whose BMI-for-age was less than the 50th percentile (Freedman et al., 2005). Furthermore, according to the Department of Health, Executive Yuan, Republic of China (Taiwan) (2011), over 50% of the ten leading causes of death in 2010 were related to adulthood obesity such as malignancies, heart diseases, cerebrovascular diseases, diabetes, and hypertension. Thus, childhood overweight and obesity has a profound effect on one’s health and quality of life in adulthood.

**Self-regulation and children’s weight status.** The etiology of children’s overweight and obesity is complicated and multifaceted. Fundamentally, childhood overweight and obesity result from sustained energy imbalance, which means there is more energy intake than expenditure needed for normal child growth (Sanderson & Faith, 2010). Self-regulation is present from the beginning of life, and people have a mixed self-regulating mechanism with additional self-regulating flexibility that develops through experience to guide their development and adaptation (Steinberg et al., 2011). From the perspectives of homeostatic theory and self-regulation, individuals who are overweight or obese have lost the ability to recognize the internal hunger and satiety signals that are part of homeostatic regulation and respond instead to cues that are unrelated to the physiological needs of their body (Stroebe, Papes, & Aarts, 2008). For example, Francis and Susman (2009) reported that compared with children who showed high self-regulation at 3 and 5 years, children who exhibited a compromised ability to self-regulate had the highest BMI scores at each time point (3 and 5 years) and the most rapid gains in BMI in their adolescence.
Further, Lowe and Butryn (2007) found that people experienced weight problems if their eating was overly influenced by hedonic rather than homeostatic hunger. Externality theory assumes that exposure to food-relevant external stimuli triggers eating in overweight and obese individuals (Schachter & Rodin, 1974). As Pinel and associates (2000) noted, people in food-rich environments rarely experience energy deficits, but they eat because of the pleasure and satisfaction they expect to derive from food.

Vohs and associates (2008) noted that people have a strong desire to consume tasty but unhealthy foods after they have engaged in an act of self-regulation. Fisher and Birch (1999) also noted that when caregivers restrict a child’s access to highly palatable foods, they will prefer certain foods and over-consume these foods when they are available. Consequently, these highly restricted children will have a poorer self-regulation of energy intake, which is related to a greater weight gain.

Sequelae of Childhood Overweight and Obesity

**Physical sequelae.** Research has revealed that childhood overweight and obesity is associated with a variety of current and future adverse consequences (AAP, n.d.; Dietz & Robinson, 2005; Fu, Wen et al., 2008); thus, the risk of developing an early morbidity is increased as expected for children who are overweight and obese (Cali & Caprio, 2008; Must & Anderson, 2010). The immediate health consequences for children who are overweight or obese include an elevated blood pressure (Chen, Fox, Hasse, & Wang, 2006; Chu, 2001; Freedman et al., 2007; Huang, 2007; Lin et al., 2011; Wake et al., 2010), an elevated cholesterol (Bell et al., 2007; Freedman et al., 2007), asthma (Gilliland et al., 2003; von Mutius et al., 2001), and an increased risk for Type 2 diabetes (Bell et al., 2007; Cali & Caprio, 2008; Chang, Li, Wei, & Chuang, 2006; Huang, 2007; Wei et al.,
2003; Yoon et al., 2006). For example, a large cohort study of Taiwanese children and adolescents (6 to 18 years) were surveyed in 2001 for their weight and blood pressure. The survey found that the risk of having hypertension doubled for the children who were overweight or obese when compared with the counterparts (Chen et al., 2006). Additionally, Chang and associates (2006) found that the incidence of Type 2 diabetes in Taiwanese children and adolescents was six times higher than Type 1 diabetes and indicated that obesity was the most important risk factor for Type 2 diabetes in children.

In terms of health and disease, the major reason for studying obesity in children is increased long-term health risks. Serious long-term health complications include diabetes (Bhargava et al., 2004; Freedman et al., 2005), cardiovascular disease (Baker et al., 2007; Barker et al., 2005; Botton et al., 2007; Huang, 2007), cancer (Daniels, 2006; Frayling et al., 2007; Wu, Chou et al., 2009), and depressive symptoms (Allen, Byrne, Blair, & Davis, 2006; Goodman & Whitaker, 2002; Zhong et al., 2010). For instance, Wu and associates (2009) investigated the relationship between adiposity and risk of breast cancer in Taiwanese women and found that waist circumference was a significant factor for the risk of breast cancer in both pre- and postmenopausal women.

**Psychosocial Sequelae.** Overweight children are more likely to develop not only physical disorders but also socioemotional problems. Research has reported the association between overweight and the risk of having depressive symptoms in both adult and pediatric populations (Erickson et al., 2000; Goodman & Whitaker, 2002; Zhong et al., 2010). Erickson and associates (2000) evaluated the association between obesity and depressive symptoms in school-aged children, and revealed that depressive symptoms were associated with overweight concerns in girls. Another study conducted by Zhong
and associates (2010) indicated that obesity was associated with a higher risk of possible depression and had varied influences on depressive symptoms in their 2,641 participants.

Weight-related psychological distress may stem from concerns over one’s weight, being teased or isolated by peers or family; which may further impact these overweight or obese children’s eating behaviors (Haines et al., 2006; Hayden-Wade et al., 2005; Lumeng et al., 2010; Neumark-Sztainer et al., 2002; Young-Hyman et al., 2006). For instance, studies revealed that overweight children were more likely to experience weight- and appearance-related teasing by peers, which in turn was associated with dysfunctional eating behaviors such as bulimic eating behavior (Hayden-Wade et al., 2005; Neumark-Sztainer et al., 2002). Furthermore, dysfunctional eating behaviors caused by weight-related psychological distress may bring an increased risk for additional weight gain (Neumark-Sztainer et al., 2002).

Childhood overweight and obesity is a chronic health issue and may lead to stigmatization, low self-esteem, body dissatisfaction, poor peer relationships, and poor quality of life (Sgrenci & Faith, 2011). Research has found that many overweight and obese children were stigmatized (Latner, Stunkard, & Wilson, 2005) and had lower self-esteem (Eisenberg, Neumark-Sztainer, & Story, 2003). Although weight related stigma may vary among races and cultures, it was generally reinforced by the media (Puhl & Brownell, 2003). A rich body of research has shown that overweight and obese individuals were more likely to be teased, bullied, and isolated than their counterparts (e.g. Hayden-Wade et al., 2005). Likewise, research has also revealed that obese children reported a lower health-related quality of life than non-obese groups (Kolotkin et al., 2006; Schwimmer, Burwinkle, & Varni, 2003). Hence, identifying possible precursors to
excess weight gain, and understanding their relationships is crucial and will help health care professionals to design effective interventions at an early age before overweight and obesity develops. For those children who are already overweight, it is important to recognize common psychological consequences that they may encounter. Thus, overweight and obese children will benefit from talking about their experiences and emotions, and learning effective coping strategies for preventing psychological distress.

**Social-Economic Sequelae.** Overweight and obesity impose a considerable economic burden on society. In Taiwan, the Department of Health (2011) recently made a public announcement that six out of ten leading causes of death in 2010 were related to adulthood obesity. There is a well-established body of evidence claiming that medical and treatment costs for overweight- and obesity-related health disorders used substantial resources from health systems (Fu, Wen et al., 2008; Kuhle et al., 2011; Trasande, 2010; Trasande & Chatterjee, 2009; Wang et al., 2008). Wang and Dietz (2002) examined the trend of obesity-associated diseases and related economic costs in youths aged 6-17; obesity-associated annual hospital costs increased from $35 million (0.43% of total hospital costs) during 1979-1981, to $127 million (1.70% of total hospital costs) during 1997-1999. Another study estimated that medical expenditures attributed to overweight and obesity accounted for 9.1% of total U.S. medical expenditures in 1998; the economic burden of overweight and obesity in the US was $78.5 billion in 1998, and $93 billion in 2002 (Finkelstein, Fiebelkorn, & Wang, 2003). Wang and associates (2008) estimated future obesity-related healthcare costs for adults and suggested that the total healthcare costs attributable to overweight/obesity would double every decade until 2030, when it would account for 16-18% of total US healthcare costs. Similarly in Taiwan, Fu and
associates (2008) analyzed how an increase in obesity results in metabolic diseases, which in turn means higher cost revealed that the cost of obesity accounted for 2.9% of the national total healthcare expenditure; hence, overweight and obesity has increased health costs because of the higher prevalence of metabolic syndrome related diseases.

Because of an increased prevalence of childhood overweight and obesity, obesity-related disorders such as Type 2 diabetes and hypertension are seen with increasing frequency in children. Therefore, it is possible that the increased prevalence of childhood overweight and obesity will amplify the cost of health care and consequently place a huge economic burden on society (Fu, Wen et al., 2008; Kuhle et al., 2011; Trasande, 2010; Trasande & Chatterjee, 2009; Wang et al., 2008). For instance, a study conducted in Canada to assess health service use and costs among overweight and obese children revealed that total health care costs were higher in overweight and obese children than in normal weight groups; in addition, obese children had higher physician costs, more physician visits, and more specialist referrals than their counterparts (Kuhle et al., 2011). Trasande and Chatterjee (2009) assessed the utilization of healthcare expenditure among overweight and obese children aged 6-19 years based on the data from a 2002-2005 Medical Expenditure Panel Survey (MEPS) in US. They found that children who were overweight and obese in the years during the MEPS spent $273 more in outpatient visit expenditures, $178 more in prescription drug expenditures, and $37 more emergency room expenditures than normal and underweight children on average. Additionally, elevated BMI in childhood was associated with $14.1 billion in additional prescription drug, emergency room, and outpatient visit costs annually.
The increases in healthcare expenditures and utilization in pediatric populations only represent a small subset of burdens that can be attributed to pediatric obesity. Intangible costs due to the conditions such as lost school days of children and workdays of caregivers associated with the co-morbidities of childhood obesity are hard to quantify (Trasande & Chatterjee, 2009). Therefore, effective programs can help prevent adult obesity-associated disorders (Trasande, 2010; Trasande & Chatterjee, 2009).

**Summary**

The rising prevalence and severity of effects of childhood overweight and obesity over the last several decades indicate that more effective intervention programs are necessary. Trasande (2010) also concluded that investing to reduce childhood obesity is cost-effective because childhood overweight and obesity has prognostic physiological and economic consequences. Thus, examining these issues within the proposed research study would inform future research that may be beneficial for health professionals, so that they can implement effective programs to avoid the otherwise inevitable health and societal consequences of overweight and obesity.

**Children’s Eating Behaviors and Eating Styles**

Overweight and obesity in children, often due to poor eating behaviors, has drawn a lot of attention worldwide (Budd & Hayman, 2006; Davison & Birch, 2001; Kleiser, Rosario, Mensink, Prinz-Langenohl, & Kurth, 2009; Pan et al., 2008; Patrick & Nicklas, 2005; Scaglioni, Salvioni, & Galimberti, 2008; Van Strien & Oosterveld, 2008; Ventura & Birch, 2008). Eating behaviors are complicated phenomena that are influenced by multiple factors (Schlundt, Hill, Sbrocco, Pope-Cordle, & Kasser, 1990). In fact, there is no comprehensive approach to understanding eating behaviors. Overeating behaviors are
central in the development of overweight and obesity in children as excess caloric intake - relative to energy expenditure - will result in the storage of energy as fat, which will in turn lead to excessive levels of fat in the body (Kleiser et al., 2009; Van Strien & Oosterveld, 2008; Ventura & Birch, 2008). Research has found that stress and distress in both adults and children were able to provoke overeating behaviors (Adam & Epel, 2007; Austin et al., 2009; Chen et al., 2007; Greeno & Wing, 1994; Martyn-Nemeth et al., 2009; Nguyen-Rodriguez et al., 2008; O’Connor et al., 2008; Talen & Mann, 2009).

**Eating Behaviors and Eating Styles**

Related to childhood overweight and obesity, dimensions of children’s eating behaviors include eating styles, food preferences, and dietary intake (Ventura & Birch, 2008). Food preferences indicate an individual’s food choices as well as their likes or dislikes, whereas dietary intake indicates the quantity of food one actually eats (Ventura & Birch, 2008). Eating styles are a part of the major determinants of childhood overweight and obesity (Kleiser et al., 2009; Pan et al., 2008; Van Strien & Oosterveld, 2008; Ventura & Birch, 2008), and refer to “specific aspects of how a child eats” (Ventura & Birch, 2008, “Eating Style Food Preferences,” para. 1). Van Strien and colleagues (1986) further categorized overeating into three different styles (See Table 1.1): emotional eating, external eating, and restrained eating. The emotional eating style refers to when eating occurs in response to stress or negative emotions; the external eating style occurs in response to external stimuli; and restrained eating refers to eating less than desired in order to maintain or lose weight (Van Strien et al., 1986). Elfhag and associates (2010) pointed out that eating styles would affect food preferences. Also, Mischel and Ayduk (2011) described the relationship between overeating styles and
delay of gratification, that is, individuals’ overeat due to having greater difficulties in delaying consumption than their counterparts. Kleiser and associates (2009) further commented on the importance of recognizing eating styles more than food preferences and consumption. Hence, this study laid emphasis on children’s eating styles because these overeating styles are specifically related to weight gain (Elfhag & Morey, 2008; Van Strien & Oosterveld, 2008). It is beneficial for individuals to be aware of their eating styles because this will affect their energy balance and have potentially deleterious long-term effects on health (Hagger et al., 2009). Accordingly, it is crucial for health professionals to recognize these eating styles in order to facilitate effective individualized intervention programs (Braet et al., 2008).

**Emotional eating style.** Emotional eating has been found to be the most important determinant for increased food consumption (Van Strien, 2000). There is evidence that obese youth have elevated emotional eating tendencies compared with non-obese youth (Tanofsky-Kraff et al., 2008). Derived from psychosomatic theory (Bruch, 1964, 1997; Ganley, 1989), emotional eating styles represent the tendency to eat in response to negative mood states (i.e. when feeling anxious or depressed) that lead to over consumption and obesity (Kaplan & Kaplan, 1957). Loss of appetite should be the natural physiological response when individuals encounter stress (Ganley, 1989; Greeno & Wing, 1994; Van Strien et al., 1986; Zesiewicz, 1992); however, according to psychosomatic theory, food intake and psychological stress are correlated; in other words, daily stress can cause an emotional eating style (O’Connor et al., 2008; Van Strien et al., 1986). Furthermore, Adam & Epel (2007) proposed that stress and distress would interrupt regular and normal eating through the effects on the reward system.
Accordingly, emotional eating happens in response to negative emotions and will momentarily help individuals to reduce psychological distress and anxiety but resulting in other physical and psychologically issues in the future (Bruch, 1964; Ganley, 1989; Van Strien & Oosterveld, 2008; Van Strien & Ouwens, 2003; Van Strien et al., 1986). Although one study reported a heritability estimate of 60% for emotional eating (Tholin, Rasmussen, Tynelius, & Karlsson, 2005), the relationship between genetics and emotional eating remains unclear. Since a higher degree of emotional eating points toward a deficient inner cognitive and affective structure and lack of interceptive awareness, individuals with a high degree of emotional eating may benefit from therapy focusing on evoking awareness of one’s own impulses, feelings, and needs rather than focusing on losing weight (Van Strien & Ouwens, 2007).

There seemed to be a positive correlation between emotional and external eating (Van Strien et al., 1986; Van Strien, Schippers, & Cox, 1995). Both eating styles were found to be linked to a higher consumption of sweets and soft drinks (Elfhag, Tholin, & Rasmussen, 2008) along with a tendency to overeat (Elfhag & Linne, 2005).

**External eating style.** Derived from externality theory, external eating refers to eating in response to external food cues appealing to the senses such as smell of food (Jansen et al., 2003; Schachter, 1968; Van Strien et al., 1986). Evidence for this assertion came from findings that overweight individuals’ consumption was greater than those with a normal weight, particularly in response to external stimuli such as the visual salience of food cues (Jansen et al., 2003; Schachter & Rodin, 1974). Further assertion of this externality theory showed overweight individuals were less responsive to internal appetitive signals such as hunger and satiety (Fisher & Birch, 2002; Fisher, Cai,
Jaramillo, Cole, Comuzzie, & Butte, 2007; Van Strien & Oosterveld, 2008; Van Strien & Ouwens, 2003; Wardle et al., 2001); in addition, they tended to eat larger amounts than necessary (Van Strien & Oosterveld, 2008; Van Strien & Ouwens, 2003). Although most research indicated overweight individuals tended to have this kind of eating style, inconsistent study results show that hyper-responsiveness to external food cues was evident among individuals in all weight categories (Rodin & Slochower, 1976; Milstein, 1980). In conclusion, sensitivity to external cues could lead to a higher degree of external eating; therapy may focus on sensitivity to food cues by means of behavioral methods such as stimulus control and/or cue exposure (Hou et al., 2011; Brignell, Griffiths, Bradley, & Mogg, 2009; Coelho, Jansen, Roefs, & Nederkoorn, 2009).

Restrained eating style. Restrained eating has been associated with both higher (Elfhag & Linne, 2005) and lower body weight (Boschi, Iorio, Margiotta, D’Orsi, & Falconi, 2001), and healthier food intake, which includes a large amount of fruits and vegetables (Elfhag et al., 2008). However, restrained eating has also been considered problematic and plays a role in obesity. An individual’s cognitive process that is necessary to prevent eating in the face of biological pressures toward weight gain is called restraint (Herman & Mack, 1975). Explained by restraint theory (Herman & Polivy, 1983), restrained eating style as the outcome of unsuccessful dieting refers to the conscious determination of food intake and calories in order to promote health or control body weight (Elfhag et al., 2008; Van Strien et al., 1986; Van Strien & Oosterveld, 2008; Van Strien & Ouwens, 2003). Thus, with the intention of maintaining weight, restrained eaters attempt to eat less than they anticipated. However, disinhibiting effect in restrained eaters is likely to occur because dieting is easily abandoned when dietary self-control is
inhibited by stress, anxiety, or depression (Zellner et al., 2006). This can become a vicious cycle: dieting causes overeating and overeating causes a need to diet (Herman & Polivy, 1975). Hence, Herman and Polivy (1983) proposed that individuals with weight problems are often chronic dieters (i.e. restrained eaters) who regulate their food intake according to self-set rules. As a result of their chronic dieting, they lose the ability to recognize body hunger and satiety cues. Since the cognitive regulation of eating requires a great deal of cognitive resources, their control breaks down because they get distracted by emotions when they pass their diet boundary (Herman & Polivy, 2011).

Research has found that restrained eaters are more sensitive to environmental eating cues and less sensitive to internal (hunger and satiety) cues (Brunstrom, Yates, & Witcomb, 2004; Lowe, 1993). A study also found that restrained eaters eat somewhat more when distressed than when calm, whereas unrestrained eaters eat significantly less when distressed (Herman & Polivy, 2011). In addition, restrained eaters are negatively affected through false feedback related to their weight (Heatherton, Herman, & Polivy, 1989), which can produce disinhibitory reaction as well (McFarlane, Polivy, & Herman, 1998). However, Elfhag and Morey (2008) found that restrained eating was negatively related to external and emotional eating. In one sample of Taiwanese fourth- to sixth-graders, the prevalence of having restrained eating was not high but a large number of children already performed some self-controlling behaviors to avoid gaining weight (Lin, Yang, Hang, & Pan, 2007). In other words, there is evidence that all three eating styles can be influenced by stress or anxiety. Hence, restrained eating should be evaluated with the other two eating styles rather than being considered alone. Researchers have suggested that the best treatment for overweight is to stop dieting and simply accept one’s
natural heavy weight because the therapy should focus on underlying problems rather than weight status (Foster, 2002; Polivy & Herman, 1983).

**Self-Regulation and Eating**

People react differently to food; their responses vary depending on the eating behaviors in question (Thayer, 2001). Gailliot and associates (2008) stated that self-regulation can help prevent unhealthy eating styles, and it can allow people to adhere to their dietary goals and maintain a healthy weight. Hence, the self-regulation of eating refers to deliberate attempts to override natural regulatory processes (Herman & Polivy, 2011). For children, Tan and Holub (2011) stated that children who self-regulate while eating and who show high self-regulation abilities are less likely to be overweight than children who do not show the same capacities for self-regulation. Children can self-regulate their energy intake by responding to internal signals about the energy content of the foods they eat; however, they are susceptible to environmental stimuli such as the presence of palatable foods (Birch, Fisher, & Davison, 2003).

Thayer (2001) stated that both positive and negative moods can cause overeating, but usually negative moods are the main cause. Mood regulation through food is a moment-to-moment process that occurs as individuals respond to feelings of tension and low energy by eating food (Thayer, 2001). Emotional eaters and individuals using a restrained eating style are those most likely to overindulge when stressed (Thayer, 2001). Moreover, Herman and Polivy (1983) pointed out that restrained eaters often have weight problems, and they regulate their food intake according to self-set rules. As a result of their chronic dieting, they lose the ability to recognize body hunger and satiety cues.
Fisher and Birch (1999) also noted that caregivers who excessively restrict a child’s access to highly palatable foods will promote his or her food preference and over-consumption of those restricted foods once they are available because the highly restricted child usually has poorer self-regulation of energy intake. On the other hand, Tan and Holub (2011) found that a child’s self-regulation predicted parent’s use of restrictive feeding practices above and beyond the child’s inhibitory control and the parent’ concerns about the child’s weight status. Hence, parents use less restrictive feeding practices when s/he believes the child could self-regulate.

Since the cognitive regulation of eating requires a great deal of cognitive resources, when heightened tension and emotional disturbance occur, the process of self-regulation that drives people to eat leaves these dieters especially vulnerable to overeating, the very temptation they are trying to avoid (Herman & Polivy, 1983; Thayer, 2001). In summary, people try to self-regulate in order to escape negative feelings or cope with stress; hence, managing mood by learning self-regulation and gaining self-control is a key issue to controlling overeating (Thayer, 2001).

**Influencing Factors of Children’s Eating Behaviors and Eating Styles**

Factors that influence children’s eating behaviors and eating styles are multifactorial such as personal and environmental factors. Personal factors such as age, gender, weight status, and satiety were highly suggested (Braet et al., 2008; Wardle et al., 2001); whereas environmental factors and family contexts, such as caregivers’ characteristics and parenting might need to be considered as well (Budd & Hayman, 2006; Davison, Francis, & Birch, 2005; Patrick & Nicklas, 2005; Scaglioni et al., 2008; Ventura & Birch, 2008).
Age, gender, weight status, and hunger/satiety. The relationships between age, gender, and children’s eating styles are inconsistent. One study in Taiwan found that older junior high students were more likely than the younger junior high students to emotionally eat (Huang, 2008). Van Strien and Bazelier (2007) examined the prevalence of eating styles in a group of children 7-12 years old and found that younger children (7-9 years) scored significantly higher on emotional and external eating but not restrained eating. In a clinical sample of obese adults, both emotional and external eating styles were inversely correlated with age; in addition, no age difference was found in restrained eating (Elfhag & Morey, 2008).

Girls were more likely to display an emotional eating style (Braet et al., 2008), whereas boys showed more external eating styles (Hill et al., 1994; Van Strien & Bazelier, 2007). In Hill and colleagues’ (1994) study, boys were more likely than girls to attribute eating to external stimuli. However, Wardle and associates (1992) examined eating styles in adolescents and found that there were no gender differences in external eating style.

Braet and colleagues (2008) examined the age and gender differences in eating styles of 1,458 normal and overweight children between the ages of 7 and 12, and 1,016 adolescents 13-18 years old. Restrained and emotional eating styles occurred at different rates between genders, regardless of age or weight differences (Braet et al., 2008). In addition, studies also supported that no gender differences were found for restrained eating style in children under 13 (Braet et al., 2008; Peng, 2006). Furthermore, emotional and external eating styles were age-related and gender-specific; overweight adolescent girls scored higher on restrained and emotional eating than the normal-weight reference group, and overweight adolescent boys scored higher on restrained and external eating.
than their reference group (Braet et al., 2008). In another study conducted by Van Strien and Bazelier (2007), they reported that only external and restrained eating had gender differences in a group of children 7-12 years old; additionally, boys scored higher on external eating, whereas girls scored significantly higher on restrained eating.

Eating behaviors and weight status are closely linked, but study results have not been entirely consistent. As described above, Braet & Van Strien (1997) proposed that overweight children had stronger links for emotional, external, and restrained eating styles. Studies have shown that obese children had lower responsiveness to internal satiety signals (Van Strien & Oosterveld, 2008; Fisher et al., 2007; Fisher & Birch, 2002) and were more vulnerable to external food stimulus than normal weight children (Braet et al., 2008; Jansen et al., 2003). Webber and colleagues (2009) also supported that emotional and external eating styles and children’s weight were positive associated. Similarly, Braet and associates (2008) have reported that overweight children and adolescents were found to have higher prevalence of external and restrained eating styles; in addition, only restrained eating was higher in overweight children (aged 7-12) when compared with normal-weight children. However, Wardle and colleagues (1992) reported that restrained, but not emotional and external eating styles, was related with a higher BMI. Likewise, Elfgan and Morey (2008) documented that BMI was not significantly linked to any of the eating styles in a sample of obese adults.

It is believed that people have the ability to clearly recognize the natural physical signs of hunger and satiety (Hawks, Merrill, & Madanat, 2004). The awareness of hunger/satiety is inborn; hunger/satiety is an appetitive trait that represents the ability of a child to reduce food intake after eating to regulate energy intake (Wardle et al., 2001).
Infants tend to be highly responsive to internal hunger and satiety cues; however, the level of awareness decreases as age increases (Carnell & Wardle, 2007, 2008; Tylka, 2006; Wardle et al., 2001). In other words, children will gradually lose the ability to effectively self-regulate energy intake, thus promoting episodes of over-consumption and subsequently gain excessive weight.

An individual should be aware of his or her physiological hunger and satiety cues to determine when and how much to eat and when to stop eating (Polivy & Herman, 1992; Tribole & Resch, 1996). It is hypothesized that sensitivity to internal cues of satiety is likely to reduce intake (Webber et al., 2009). As suggested by scholars, hunger/satiety, the internal appetitive signal, is associated with obesity or dysfunctional eating (Fisher & Birch, 2002; Schachter & Rodin, 1974; Van Strien & Oosterveld, 2008; Van Strien & Ouwens, 2003; Wardle et al., 2001). Research among young adults has found that those people who were aware of their internal hunger and satiety signals and trusted these signals to guide their eating behaviors would have a higher level of self-esteem, dispositional optimism, and proactive coping (Tylka, 2006) as well as lower BMI (Smith & Hawks, 2006; Tylka, 2006). Likewise, studies among children have found that overweight children had weaker satiety responses compared to their normal weight counterparts (Carnell & Wardle, 2008; Sleddens, Kremers, & Thijs, 2008; Viana, Sinde, & Saxton, 2008; Wardle & Carnell, 2009; Webber et al., 2009). In addition, underweight children had higher satiety awareness compared to the healthy weight group (Carnell & Wardle, 2008; Viana et al., 2008; Webber et al., 2009). However, the difference between satiety responsiveness and weight was not supported in the sample of 52 children aged 7-13 while assessing their free access to snack food in the absence of hunger (Moens &
Braet, 2007). Moreover, hunger/satiety awareness did not vary by gender (Wardle et al., 2001). In addition, stronger satiety responsiveness was associated with higher external eating (Sleddens et al., 2008; Viana et al., 2008; Wardle et al., 2001) and higher emotional eating (Viana et al., 2008; Wardle et al., 2001).

**Family context.** Childhood obesity is closely rooted within the family food environment (Campbell, Crawford, & Ball, 2006; Ventura & Birch, 2008). While most studies focused on similarities and differences in eating behaviors of individuals of the same generation (Tholin et al., 2005), evidence shows that children’s eating behaviors were strongly and directly influenced by their parents (Davison & Birch, 2001) and environment, which parents and other family members can shape (Budd & Hayman, 2006; Hasenboehler, Munsch, Meyer, Kappler, & Vogele, 2009; Patrick & Nicklas, 2005; Scaglioni et al., 2008; Ventura & Birch, 2008). Problems with family functioning have been related to childhood overweight and obesity. Structured parenting with clear communication and adequate behavioral control can promote healthy eating behaviors in children (Chen & Kennedy, 2004). Moreover, poor family functioning may contribute to bad eating behaviors and eating styles by increasing stress levels and not providing support for a healthier lifestyle (Rhee, 2008). Hasenboehler and colleagues (2009) reported that there was a positive relationship between family functioning and children’s external eating, and a negative relationship between family functioning and children’s restrained eating behavior. However, Gibson et al. (2007) assessed family functioning and parenting discipline styles and did not find any significant relation between these factors and children’s weight status cross-sectionally. Although mixed findings exist, it is
believed that family dysfunction can lead to being overweight through stress and
disturbed eating as ineffective coping styles (Laitinen, Ek, & Sovio, 2002).

Caregivers’ characteristics. It is suggestive that genetic influences may play an
important role in individuals’ eating behaviors such as food preference (Falciglia &
Norton, 1994), dietary energy density (de Castro, 2006), and energy intake (Faith, Keller
et al., 2004). Davison and Birch (2001) noted that children’s eating behaviors were
similar to their parents’. Fisher and colleagues (2007) examined the relationship between
heritability of overeating behavior and appetite-related hormones among overweight
Hispanic children and found that there was a genetic correlation between eating behavior
and fasting hormones. Furthermore, Tholin and associates (2005) reported that 60% of
emotional eating was genetically derived.

The development of eating behaviors is also affected by factors such as
caregivers’ attitudes and behaviors (Hayman, 2003; Patrick & Nicklas, 2005; Snoek,
Engels et al., 2007). Parental concern about their child’s weight was strongly associated
with their child’s actual BMI (Wake, Salmon, Waters, Wright, & Hesketh, 2002). Francis
and Birch (2005) reported that mothers who were preoccupied with their own weight and
eating reported higher levels of restricting daughters’ intake, and mothers’
encouragement of daughters’ weight loss was linked to daughters’ restrained eating.
Similar findings were found with sons (Anschutz, Kanters, Van Strien, Vermulst, &
Engels, 2009). Children learn about eating not only through their own experiences but
also by watching others behaviors (Hayman, 2003; Snoek, Engels et al., 2007). For
instance, parents who had problems controlling their intake were likely to have children
who showed similar patterns (Cutting, Fisher, Grimm-Thomas, & Birch, 1999).
In addition, caregivers’ education level has been associated with children’s eating. Overweight caregivers had a lower level of education than normal weight counterparts (Elfhag et al., 2010). A study found that preschoolers who had caregivers with higher education ate less sugar (Kranz & Siega-Riz, 2002). This is similar with children and adolescents; their intake of unhealthy food decreased as the caregivers’ education level increased (Liao, 2010; Xie, Gilliland, Li, & Rockett, 2003).

Socioeconomic status (SES) is another important factor when predicting eating behaviors. Higher SES was related to a healthier food intake pattern (Ruxton, Kirk, Belton, & Holmes, 1996), which may be related to restrained eating (Elfhag et al., 2010). For example, British children in lower SES groups had a higher percentage of energy from fat and a tendency to receive a greater proportion of energy from snacks than children in higher SES groups (Ruxton et al., 1996). However, Xie and colleagues (2003) found that adolescents from higher SES families had a higher intake of unhealthy food.

Parenting. Within the family context, parenting plays an important role in shaping children’s eating behaviors through modeling, which will further influence their food preferences, regulation of energy intake, and weight status (Scaglioni et al., 2008; Thompson, 2010; Ventura & Birch, 2008). Traditionally, developmental psychologists define parenting styles as attitudes and behaviors that characterize how a parent will interact with a child across domains of parenting (Darling & Steinberg, 1993). Parenting can also be classified as authoritative, authoritarian, indulgent, or neglectful (Maccoby & Martin, 1983). Parenting styles are conceptualized as providing a context for development, which can either undermine or facilitate the practices a parent employs to socialize his or her child (Darling & Steinberg, 1993).
With respect to children’s eating behaviors and eating styles, parenting can be further classified as one of two forms: feeding-specific parenting styles (feeding styles) and child-feeding practices (feeding practices) (Ventura & Birch, 2008). Feeding styles refer to parental attitudes and styles that focus on the interaction regarding a child’s feeding (Darling & Steinberg, 1993) such as behavioral control that monitors or limits a child’s eating through firm and consistent discipline (Galambos, Barker, & Almeida, 2003). Feeding practices such as pushing children to eat or using food as a reward describe behavioral strategies that parents use to control what and how much their children eat (Darling & Steinberg, 1993; Ventura & Birch, 2008). In general, feeding styles are consistent within families, and they influence the effectiveness of feeding practices, which depend on parents’ perceptions of their goals and children’s age, gender, eating styles, and weight status (Ventura & Birch, 2008).

Most research has indicated that there is a relationship between feeding-specific parenting styles (feeding styles) and children’s eating behaviors, but it has mixed results. Within a caring family context, positive parenting prevents poor eating behaviors, whereas negative parenting was associated with unhealthy eating especially in daughters (Arredondo et al., 2006; Riesch et al., 2006). For example, a study indicated that parents of obese children tended to be neglectful or less caring (Lissau-Lund-Sorensen & Sorensen, 1992). Rhee and associates (2006) revealed that parents who had dysfunctional and negative parenting had overweight children. Likewise, a cross-sectional study found that families with overweight children used more indulgent feeding styles than families with non-overweight children (Moens, Braet, & Soetens, 2007). Regarding specific parenting styles, authoritative parenting (positive parenting) was found to decrease
children’s emotional eating (Topham et al., 2011). However, Chen and Kennedy (2004) examined family functioning, parenting style, and children’s weight status in Taiwan and the US. They found a positive relationship between democratic parenting and children’s BMIs in both countries. Furthermore, Chen and associates (2005) found that parenting styles were not associated with Taiwanese school-aged children’s weight status.

Child-feeding practices (feeding practices) are related to a child’s eating behaviors. Snoek and colleagues (2007) suggested that maternal behavioral control was associated with increased emotional eating in adolescents; this indicated that poor parenting was related to unhealthy eating. More pressure from parents can create a higher food intake in children (Campbell et al., 2006). Hence, when parents force their children to eat more, they may cause their children to have a higher level of restrained and emotional eating styles, which are related to childhood overweight and obesity (Carper et al., 2000). A study examining children’s eating styles and their parents’ control revealed that parental pressure to eat more was related to their children’s emotional and restrained eating (Carper et al., 2000). Another study documented that perceived pressure to eat was positively related to emotional and external eating in boys (Van Strien & Bazelier, 2007). However, in the situation when a parent thinks his or her child is at risk for obesity, the parent’s concern will in turn be affected by the child’s eating styles. Thus, one study found that parents who perceive their children to be overweight were less likely to use pressure during feeding (Keller, Pietrobelli, Johnson, & Faith, 2006).

Restrictive feeding practice is another common controlling strategy that parents use to set limits on what their children eat. The use of restrictive feeding practice was found to make children become overweight (Birch et al., 2003; Costanzo & Woody,
have higher disinhibition (Carper et al., 2000) and push them to eat even in the absence of hunger, especially when given access to palatable snack foods (Birch et al., 2003; Fisher & Birch, 1999). Van Strien and Bazelier (2007) documented that perceived restriction was negatively related to emotional and external eating and positively related to the restrained eating in girls. Likewise, Carper and associates (2000) reported that parents’ restriction on children’s eating was related to their children’s external eating.

In conclusion, parenting plays an important role in shaping a child’s eating environment and eating behaviors. Relationships may remain inconsistent, however. Although the evidence here does not claim parenting causally influences children’s weight and eating styles, most of these relationships can be bidirectional and reciprocal. Furthermore, many eating behaviors and eating styles can be seen in childhood and are associated with overweight and obesity. Although genetic influences on adiposity and behavioral traits can work against the possibility of intervention, a number of personal, family, and environmental influences play a role and some are modifiable such as self-regulation and parenting.

**Empirical Evidence of Children’s Eating Behaviors and Eating Styles**

Most studies that assess eating behaviors or eating styles are primarily conducted on adult populations. Although studies on eating behaviors in children are limited, eating behaviors are one of the most important determinants of childhood obesity (Budd & Hayman, 2006; Davison & Birch, 2001; Kleiser et al., 2009; Pan et al., 2008; Scaglioni et al., 2008; Van Strien & Oosterveld, 2008; Ventura & Birch, 2008).

Studies concerning eating styles in children have found mixed results. Van Strien and Bazelier (2007) examined the prevalence of eating styles in a group of normal and
overweight children 7-12 years old and found that external eating was the most prevalent style, followed by restrained and emotional eating styles. One of the few studies conducted in Taiwan on restrained eating style among school-aged children found that the prevalence of restrained eating was about 16% and it correlated with a child’s BMI (Peng, 2006). In other studies using 822 Taiwanese children and adolescents (sixth to ninth grades) (Lin & Lin, 2004) and 1,076 Taiwanese high school girls (Chen, 2002), the prevalence of restrained eating was about 27% (male), 39% (female) (Lin & Lin, 2004), and 12% (Chen, 2002), respectively. Another study conducted by Braet and colleagues (2008) investigated differences in eating styles among overweight and non-overweight children between the ages of 7 and 18. They found that only external and restrained eating styles existed in all overweight groups; a lower prevalence of emotional and external eating styles was seen in overweight children (aged 7-12).

Braet and Van Strien (1997) compared emotional, external, and restrained eating styles between obese and non-obese children between the ages of 9 and 12, and they concluded that all the scales for emotional, external, and restrained eating styles were significantly higher in obese children, regardless of gender; higher scores were related to a greater caloric intake; and emotional and external eating styles were associated with negative feelings. Likewise, Webber and colleagues (2009) reported that children’s weight and both emotional and external eating styles were positively correlated even after controlling for age, gender, and parental education. In addition, among three common overeating styles, studies found that only restrained eating was higher in overweight children when compared with normal-weight counterparts (Braet et al., 2008; Caccialanza et al., 2004; Snoek, Van Strien et al., 2007). Ledoux and associates (2011)
examined eating styles and adiposity among multiethnic children and adolescents. They found that restrained eating was positively related to adiposity, while external eating was negatively related. Neither eating style was found to be associated with differences of age or gender. Nguyen-Rodriguez and colleagues (2008) found no differences in emotional eating between normal and overweight children between the ages of 11 and 15. Caccialanza and colleagues (2004) also documented no association between emotional/external eating and weight in preadolescent children.

**Interventional Studies of Children’s Eating Behaviors and Eating Styles**

Manzoni and colleagues (2009) reported that relaxation training was effective in reducing emotional eating episodes and depressive symptoms in women with obesity. Llewellyn and associates (2011) suggested that it was also helpful to use behavioral and psychometric measures to identify children’s eating behaviors and eating styles. Thus, early identification of unhealthy eating behaviors or styles could be targeted with appropriate and individualized interventions. Despite these limitations, success has been reported when children and adolescents changed eating behaviors with others’ help (Flodmark, Marcus, & Britton, 2006). An intervention study conducted by Johnson (2000) aimed to improve preschoolers’ self-regulation of energy intake by using demonstration dolls to teach them how to listen to internal safety cues and improve their intake regulation. Furthermore, Bergh and colleagues (2008) have shown promising results in their intervention with extremely obese girls by teaching them to regulate their eating rate using computerized feedback to improve their satiety signals.

For this current study, examining the relationships among children’s eating styles and other major variables such as stress and resourcefulness may be able to provide a
new way of thinking and a sound foundation for designing alternative, effective, and tailored intervention programs.

Measurements

When studying children, most of the instruments used for assessing their eating behaviors are caregiver reports, and sometimes children report on their own eating habits using modified versions of adult self-report questionnaires (Shunk & Birch, 2004). For instance, Van Strien and associates (1986) first developed the 33-item Dutch Eating Behavior Questionnaire (DEBQ) for adults to assess three different styles of overeating behavior -- emotional eating, external eating, and restrained eating -- in order to include multifactorial characteristics of eating behaviors. The original Dutch version of the DEBQ has been translated into many languages such as English and Chinese (Van Strien, 2005) and has shown a good factorial validity and reliability (Van Strien & Oosterveld, 2008). According to Van Strien and colleagues (1986), the emotional eating subscale asks participants to identify the tendency to increase eating when they feel irritated or stressed. The external eating subscale refers to eating behaviors that are triggered by the smell or appearance of foods or the presence of other people who are eating. The restrained eating subscale asks participants to rate their degrees of concerns related to weight and eating. It has been used far more extensively with adult and adolescent populations. Although DEBQ is a reliable instrument and can be used as a screening tool for assessing eating styles of children (Braet & Van Strien, 1997), a parent-report version of the DEBQ (DEBQ-P) (Caccialanza et al., 2004) has been developed to assess the eating styles from parents’ perspectives. Another valuable measure for gathering information on children’s eating styles is the Children’s Eating Behavior Questionnaire (CEBQ) (Wardle et al.,
2001). Consisting of eight subscales, including satiety responsiveness (SR), the CEBQ was developed to assess a range of eating behavioral traits related to obesity risk in children. Although the CEBQ also showed sound psychometric properties, it is a parent-rated measure rather than child self-report. A child self-report version (DEBQ-C) (Van Strien & Oosterveld, 2008) also has been developed and is one of the few measures for children to answer by themselves. The 20-item DEBQ-C is validated for use by children 7-12 years old (Van Strien & Oosterveld, 2008). In this present study, the DEBQ-Chinese version was used to evaluate caregivers’ eating styles, and the DEBQ-C was translated into Mandarin Chinese and tested in fifth and sixth graders in Taiwan.

**Summary**

Although conflicting evidence exists, children’s eating behaviors affect the development of overweight and obesity. These eating behaviors can lead to excessive caloric intake relative to energy expenditure, the storage of energy as fat, and subsequently to an excessive level of body fat. Since eating styles will affect food preferences and dietary intake, it is important to assess an individual’s structure of eating because the early identification of children’s eating styles and clarification of the relationships between eating styles and influencing factors may facilitate effective intervention programs to meet individualized demands.

**Overview of Stress, Cognitive Appraisals, and Coping in Children**

Lazarus and Folkman (1984) proposed the Transaction Model of Stress and Coping to elaborate the relationships between psychological stress and coping and also to provide skills for stress management. Defined by Lazarus and Folkman (1984), stress is “a particular relationship between the person and the environment that is appraised by the
person as taxing or exceeding his or her resources and endangering his or her well-being” (p. 19). Stress shows the relationship between person and environment, particularly characteristics of an individual and the nature of an environmental event (Lazarus & Folkman, 1984). Therefore, individuals respond to the demands of stress differently because of their individualized sensitivity and vulnerability.

Lazarus and Folkman (1984) proposed that stress and the demand of person–environment relationships can be mediated by cognitive appraisals. Cognitive appraisal, the subjective judgment that focuses on continuous evaluation rather than information processes, can be defined as “an evaluative process that determines why and to what extent a particular transaction or series of transactions between the person and the environment is stressful” (Lazarus & Folkman, 1984, p. 19). With respect to cognitive appraisals and stress, studies have found that positive cognitive appraisal tended to minimize the negative influence of stress on adjustment (Lightsey, 1997), whereas negative cognitive appraisal tended to exacerbate the influence of stress on adjustment (Abramson, Metalsky, & Alloy, 1989).

According to Lazarus and Folkman (1984), there are two basic forms of cognitive appraisal, primary and secondary appraisal. During primary cognitive appraisal, people evaluate how important a situation is; during secondary cognitive appraisal, people evaluate their ability to face demands (Lazarus & Folkman, 1984). Primary appraisal can be further categorized into three types: irrelevant, benign-positive, and stressful (Lazarus & Folkman, 1984). Irrelevant cognitive appraisal happens when individuals perceive that the outcome of an encounter has no value or relationship with his or her well-being; whereas benign-positive cognitive appraisal happens when individuals perceive the
outcome of an encounter to be positive thus enhancing well-being (Lazarus & Folkman, 1984). Stress appraisal is a subjective perception and is thought about in terms of objective environmental conditions (Cohen et al., 1983). Based on one's own prior experiences and learning, stress appraisals are further distinguished into harm/loss, threat, and challenge. A harm/loss appraisal is associated with events that have already occurred, whereas threat and challenge appraisals are relevant mostly to anticipated events; challenge appraisal focuses on the potential growth of an encounter in a positive way (Lazarus & Folkman, 1984).

During secondary appraisal the individual evaluates what can be done about a particular situation (Lazarus & Folkman, 1984). Bandura (1982) stated that individuals develop expectations during secondary appraisal (outcome and self-efficacy). Outcome expectancy represents an individual’s belief in obtaining a desired goal if specified actions are performed, whereas self-efficacy expectancy refers to an individual’s self-evaluation regarding his or her capabilities on performing essential behaviors to attain the desired goal (Bandura, 1982). As proposed by Compas, Connor-Smith, Saltzman, Thomsen, and Wadsworth (2001), individuals need to have abilities or skills to manage their emotions, think constructively, regulate their behaviors, and control their arousal to manage the impact of stress successfully.

Determined by cognitive appraisal, coping is a dynamic and an ongoing process and is defined as “constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person” (Lazarus & Folkman, 1984, p. 141). Coping contains purposeful responses to resolve the stressful relationship between the person and the environment.
(problem-focused coping) or to regulate negative emotions that come from stress (emotion-focused coping) (Lazarus & Folkman, 1984).

Both coping functions interact during the coping process. Problem-focused coping strategies include altering environmental barriers, directing cognitive changes, directing problem-solving, finding alternatives to delay gratification, and learning new skills (e.g., I try to figure out what the problem is, I say to myself: ‘I can make it’). Emotion-focused coping strategies include avoidance, minimization, distancing, and positive comparisons in order to reduce emotional distress (e.g., I say to myself: ‘It isn’t serious’) (Hampel & Petermann, 2006; Lazarus & Folkman, 1984). How a person copes with stress will depend on his or her developmental maturity as well as the availability of specific resources such as health, beliefs, problem-solving skills, social support, and materials (Lazarus & Folkman, 1984).

**Stress, Coping, and Self-Regulation**

Stress occurs when events and conditions exceed a person’s adaptive resources, activating physiologic processes that may induce physical disease, and also affecting behaviors that influence health, including eating and sleep (Contrada & Coups, 2003; Lazarus & Folkman, 1984). From the self-regulatory viewpoint, stress is a set of experiences, and coping is the response to these experiences (Carver, 2007). Thus, stress occurs when people encounter obstacles during the process of attaining desired goals or avoiding threats. Coping involves efforts to create conditions that foster continued movement toward desired goals or away from threats or efforts to disengage from goals that are seen as no longer attainable (Carver et al., 1993; Carver, Scheier, & Fulford, 2008). In addition, coping is defined as “regulation under stress” (Skinner & Zimmer-
Gembeck, 2007, p.119), which explains why people manage multiple aspects of the self, such as emotions and behaviors, under stressful situation (Aldwin et al., 2011). To sum up, from the perspectives of self-regulation theory and the transaction model of stress and coping, cognitive appraisal reflects the evaluation of information against internal references, and coping serves to optimize the degree of discrepancy between input (threat) and reference values (goals) activated to guide and evaluate coping when encountering stressful events (Carver, 2010; Carver & Scheier, 2001; Lazarus & Folkman, 1984). Hence, coping involves regulatory processes in stressful contexts (Carver, 2007; Eisenberg et al., 1997), and people must constantly adjust their behaviors and emotions and adapt to new environmental stimuli and demands by self-regulating.

**Children’s Stress and Childhood Weight Status**

Stress is a part of a child’s everyday life. All children experience stress, and stressful situations may come from parents, family, peers, and environment (Baranowski, 1997). Research on childhood stress is limited. According to Sharrer and Ryan-Wenger (2002), school-aged children have the ability to identify their stressors in their daily lives; such stressors may come from reality demands, social trends, academic performance, or hospitalization (Chandler, 1985).

In essence, stress has a cumulative negative effect (Compas et al., 2001; Morales & Guerra, 2006). Excessive and unmanaged stress has been found to have vicious influences on individuals’ behaviors and health (Ball & Lee, 2000; Block et al., 2009; Dietz & Robinson, 2005; Kao & Lin, 2008; Sandberg et al., 2000). Although most of the work regarding behavioral changes associated with stress-induced weight gain is conducted in adults (Wallis & Hetherington, 2004), stress-induced fluctuations in weight
status and weight-related behaviors likely have their origins in childhood (Roemmich, Smith, Epstein, & Lambiase, 2007). A study revealed that stress scores were significantly higher in children who increased at least 15% in relative weight compared to children who did not increase in relative weight (Mellbin & Vuille, 1989). Another study found that children who experienced greater psychological stress had greater total adiposity than children who were less stressed (Morgan et al., 2002).

Research documented that direct effects of stress on health and behaviors include the increase of percentage body weight, weight gain, overweight, and unhealthy eating behaviors (Ball & Lee, 2000; Block et al., 2009; Dietz & Robinson, 2005; Lee & Larson, 2000; Roemmich et al., 2007; Sgrenci & Faith, 2011; Van Jaarsveld, Fidler, Steptoe, Boniface, & Wardle, 2009). Indirect effects on health occurred through behavioral changes such as new eating behaviors (Austin et al., 2009; Chen et al., 2007; Jenkins, Rew, & Sternglantz, 2005; Levine et al., 1994; Martyn-Nemeth et al., 2009; Nguyen-Rodriguez et al., 2008; O’Connor et al., 2008). Hence, coping with stress by using ineffective eating styles will result in being overweight or obese (Adam & Epel, 2007; Austin et al., 2009; Block et al., 2009; Braet & Van Strien, 1997; Chen & Kennedy, 2005; Chen et al., 2007; Jenkins et al., 2005; Martyn-Nemeth et al., 2009; Nguyen-Rodriguez et al., 2008; O’Connor et al., 2008). For example, Block and associates (2009) analyzed the association between psychosocial stress and weight gain by conducting a nationally representative longitudinal cohort study of men and women in the U.S. They found that weight gain in men and women was associated with increasing levels of psychosocial stress. Likewise, a longitudinal analysis on the associations between perceived stress and change in BMI in adolescents found that persistent stress correlated with a higher BMI,
although perceived persistent stress was not related prospectively to an increased BMI (Van Jaarsveld et al., 2009). In relation to childhood overweight and obesity, research indicated that the percentage of childhood overweight and obesity also increased with the number of psychological stressors experienced (Koch, Sepa, & Ludvigsson, 2008).

**Academic Stress in Children**

Most children experience normative stress. Examples include taking a test or starting a new school (Levine & Munsch, 2011). Failing in school has a tremendous impact on a child’s and his/her family’s path in life; in addition, school-related difficulties, which are usually detectable, can interfere with children’s development in many areas such as cognition, motivation, and social functioning (Skinner & Wellborn, 1997). Students’ own reports validate the notion that schools can be stressful places, with academic stress the most mentioned stressor (Chang et al., 1993; Donaldson et al., 2000; Hasan & Power, 2004; Lau, 2002; Liou, 2003; Tsai, 2004; Tseng, 2002; M. Wu, 2006; Yu & Chen, 2001; Yusoff et al., 2011).

Academic stress is defined as “a disturbance induced by a student’s appraisal of academic stressors” (Leung et al., 2010, p. 90) and may arise from bad grades on tests and homework, excessive school-work, pressure to study more and caregiver and/or teacher expectation. Asian students usually have a high academic burden (Huan, See, Ang, & Har, 2008; Lee & Larson, 2000), low satisfaction and high expectations regarding their school performance (Crystal et al., 1994; M. Wu, 2006). They may suffer more academic stress than their counterparts in English-speaking countries (Ang, Huan, & Braman, 2007; Xing, Huang, Huang, Sanchez, & Ye, 2005). For instance, M. Wu (2006) revealed that academic stress was the most mentioned stressor among fourth to
sixth graders; in addition, male students had higher perceived stress and poorer academic performance than female students. However, Tsai (2004) reported that female sixth graders reported a higher level of academic stress than their male counterparts. In addition, Tseng (2002) reported that no gender differences were found in the level of perceived academic stress.

When compared with American students, a study reported that Chinese students felt more anxious when they failed to meet parental expectations regarding their academic performance (Xing et al., 2005). Common in Chinese culture, academic success is seen as a representation of family pride, social capital, and future financial security (Li, 2004). Most Chinese and Asian parents are controlling and place high expectation on their children’s cognitive development and academic achievement (Chang et al., 1993; Leung et al., 2010; Levine & Munsch, 2011; Tsai, 2004; M. Wu, 2006; Yang, 2007). In addition, most families have only one or two children, supporting the low birth rate in Taiwan. Children perceive more pressure from parents because they have no siblings or perhaps only one (Liou, 2003). Consequently, parents are more willing to invest in their children’s education, and this cultural view on the importance of academic success has resulted in high demands and additional pressures placed on children (Hung & Huang, 2006; Tsai, 2004; Wang, 2002; M. Wu, 2006; Yang & Yeh, 2006; Yu & Chen, 2001).

Family context is related to children’s perceived academic stress as well. For instance, Tseng (2002) indicated that children in single-parent families were more likely to report a higher perceived academic stress. Moreover, Tsai (2004) revealed that restricted parenting was related to children’s perceived academic stress. Liou (2003)
reported that parents with an authority-orientated parenting style had children with higher academic stress.

Evidence shows that academic stress is a contributor to variety of physical, mental, and behavioral disorders such as stomach ulcers, high blood pressure, asthma, depression, and suicide (Aheneku, Nwosu, & Ahaneku, 2000; Ang & Huan, 2006; Bossy, 2000; Hystad, Eid, Laberg, & Johnsen, 2009; Lee & Larson, 2000). For example, relationships among academic stress, depression, and suicidal thoughts were examined in adolescents in Singapore. The study found that academic stress and suicidal thoughts correlated significantly (Ang & Huan, 2006).

In conclusion, since academic stress may affect children’s health, it is important for children to have adequate coping resources to over these difficulties while contextual factors, such as one’s culture and parenting style, are not likely to change.

**Coping with Stress in Children**

Coping is a process and coping effectively with stress can develop competence. The concept of coping suggests that children are capable of positive responses even in negative environmental situations or life events (Kirschman, Johnson, Bender, & Roberts, 2009). Siegel (1992) pointed out that children responded differently to stressors and those individual-differences influenced both the child’s response to stress and his or her application of coping strategies.

Most stressful situations elicit both types of coping (Carver et al., 1989) with most people mixing together problem-focused and emotion-focused strategies (Folkman & Lazarus, 1980). A child’s developmental level is critical since it affects the type of coping he or she will use and how effective the strategy might be (Eisenberg et al., 1997). Age-
related changes in motor skills, cognitive processing, language, and mental maturation have relevance for children’s abilities to select and perform various coping strategies (Eisenberg et al., 1997). Young children are more likely to rely upon problem-focused approaches and less likely to rely upon emotion-focused approaches because they do not have the cognitive ability to fully understand the sources of stress (Eisenberg et al., 1997). Emotion-focused coping develops more rapidly in later childhood and early adolescence (Compas, Banez, Malcarne, & Worsham, 1991; Hampel & Petermann, 2005; Levine & Munsch, 2011). In addition, some types of problem-focused coping decrease with age even though problem-focused strategies are more fully developed in older children (Levine & Munsch 2011). For example, younger children may use physical or material interaction strategies to make themselves feel better when they feel sad, whereas older children tend to use more mindful strategies (Masters, 1991). Eschenbeck and colleagues (2007) also found that third and fourth graders scored lower than fifth and sixth graders in problem-solving; seventh and eighth graders scored higher than third to sixth graders in emotion regulation. As for help-seeking, Hampel and Petermann (2005) revealed that no simple age differences were found in their study on coping of children aged 8-13 years.

Types of coping strategies children use may differ based on gender (Compas et al., 2001; Sharrer & Ryan-Wenger, 1995; Spirito, Stark, Gil, & Tyc, 1995). Sharrer and Ryan-Wenger (1995) reported that boys 8 to 13 years old coped by watching television, yelling, or screaming, whereas girls were likely to cry and cuddle pets. Spirito and associates (1995) reported that girls were likely to use emotional regulation and social support and boys were likely to use cognitive restructuring and self-blame. However, other studies found that coping strategies had no gender-related differences (Chen et al.,
2007; Landolt, Vollrath, & Ribi, 2002). Some research on adolescents showed that adolescent girls used more help-seeking and problem-solving, whereas adolescent boys tended to use more avoidant coping (Eschenbeck, Kohlmann, & Lohaus, 2007).

Caregivers and/or professionals play an important role in helping children build effective coping strategies (Power, 2004). Studies examining children’s responses to stress have revealed a number of parenting variables that predicted positive adjustment in aversive situations: parental warmth, responsiveness, and positive parenting styles (Bornstein, 2002; Valiente et al., 2004; Valiente, Lemery-Chalfant, & Swanson, 2009). Parents increasingly influence their children’s appraisals and coping through modeling and coaching as their children grow (Power, 2004). For example, in the academic context, Chinese students with poor academic performance usually felt anxious because they thought they would fail to fulfill parents’ expectations (Xing et al., 2005); however, the level of stress because of poor academic performance may differ depending on these parental expectations.

**Summary**

Life is stressful. Although research on stress in children is limited, it is important to recognize children’s stress and coping, the impacts of unmanaged stress, and related influencing factors in order to help children cope with stress more effectively. In summary, caregivers or professionals can help children think about problem-solving strategies or help them reappraise stressful situations. Even young children can learn to stop and take deep breaths when they are feeling stressed, or think for a minute about pleasant things instead of the negative (Levine & Munsch 2011).
Self-Control Behaviors and Resourcefulness

While most research paradigms focus on examining pathology and deficits (Seligman & Csikszentmihalyi, 2000), researchers are increasingly recognizing the need to study positive enabling attributes. According to Rosenbaum (1990), resourcefulness emphasizes the importance of obtaining a broad collection of self-control skills that enables the individual to be in charge of his or her behaviors independently. In other words, resourceful individuals view themselves as active agents practicing control over their problems (Rosenbaum, 1990). Research has found that resourcefulness has positive impact on mental and physical health, and behavioral outcomes (Rosenbaum, 1990).

Rosenbaum’s Theory of Learned Resourcefulness

Rosenbaum’s (1990) conceptualization of learned resourcefulness was based on understandings of self-regulation rooted in the works of Meichenbaum (1977), Kanfer (1977), and Bandura (1977). According to Rosenbaum (1990), individuals will not be able to engage in health-related behaviors if they are unable to self-regulate and self-manage their behaviors. Hence, resourcefulness is a learned characteristic that consists of beliefs as well as self-regulatory skills and behaviors. Resourcefulness also helps individuals cope with stress and everyday life challenges more effectively (Rosenbaum, 1990). There are four basic assumptions of Rosenbaum’s theory of learned resourcefulness: a) human behavior is goal directed; b) self-control behaviors occur when individuals encounter obstacles in the execution of goal directed behavior; c) self-control behaviors are related to process regulating cognitions (PRC); and d) factors that influence the PRC and the self-control behaviors are multiple and interactive (Rosenbaum, 1990). Based on Rosenbaum’s theory (1990), the individual first undergoes specific PRC when
encountering stressful circumstances, in which he or she assesses the situation and how to cope with it. After a successful application of self-control skills, an individual will be more likely to believe in his or her self-efficacy when facing a similar situation again (Rosenbaum & Ben-Ari Smira, 1986). Thus, the collection of skills and behaviors necessary to execute self-control successfully includes the following areas: a) the use of cognitions and self-instructions to cope with emotional, behavioral, and physiological responses; b) the application of problem-solving skills; c) the ability to delay immediate gratification; and d) a general belief in one’s ability to self-regulate internal events (Rosenbaum, 1990).

**Zauszniewski’s Middle-Range Theory of Resourcefulness and Quality of Life (QOL)**

According to Zauszniewski’s (2006) middle-range theory of resourcefulness and quality of life (QOL), personal and social resourcefulness are two forms of resourcefulness equally important in achieving, maintaining, or regaining health. Both forms are learned through life, either formally or informally (Rosenbaum, 1990; Zauszniewski, 2006). In addition, since resourcefulness can be learned through life (Rosenbaum, 1990), resourcefulness skills can be taught (Zauszniewski, 2006). Studies in multiple disciplines have documented that teaching resourcefulness skills is beneficial in promoting individuals’ QOL.

**Major Components of Resourcefulness**

The theoretical framework for this present study was derived from Rosenbaum’s (1990) theory of learned resourcefulness and Zauszniewski’s (2006) middle-range theory of resourcefulness and QOL. According to this theoretical framework, children are capable of applying self-control behaviors (resourcefulness skills) to lessen the
undesirable effects of contextual factors (individual characteristics and a caregiver’s resourcefulness) on target behaviors (a child’s eating styles) through various process regulators (academic stress and dispositional optimism/pessimism) (Zauszniewski, 2006; Zauszniewski et al., 2008). The major components of resourcefulness, such as contextual factors, process regulators (PRs), and self-control behaviors, are described below. The target behavior (health outcome) of this present study was a child’s eating styles.

**Contextual factors.** Contextual factors are determinants of process regulators, and they can also affect personal and social resources; in addition, the impact on process regulators and resourcefulness can be either direct or indirect (Zauszniewski, 2006). Likewise, Gailliot and colleagues (2008) proposed that contextual factors may mask an individual’s underlying disposition if his or her self-regulatory abilities are poor. Contextual factors can be classified as intrinsic and extrinsic; intrinsic factors are the factors within an individual, whereas extrinsic factors are the factors that exist in an individual’s environment (Zauszniewski, 2006).

**Intrinsic factors.** The development of children’s control is affected by both maturation and experience (Bronson, 2000). According to Rosenbaum (1990) and Zauszniewski (2006), an individual’s resourcefulness starts developing in early childhood. Individual’s resourcefulness is also learned through interactions with the environment; therefore, resourcefulness is individualized and factors such as demographic characteristics (e.g. race, age, and gender), chronic conditions, and daily hassles (Aikens et al., 1992; Edwards & Riordan, 1994; Zauszniewski et al., 2001; Zauszniewski et al., 2005; Zauszniewski et al., 2008) were categorized into intrinsic factors in previous empirical studies with adult populations.
As proposed by Kendall and Braswell (1985) and Ronen (1992), children’s self-control increases as they age. Studies also found differences in resourcefulness based on age. Age was positively related to resourcefulness in a study of Thai adolescents with asthma (Preechawong et al., 2007), Taiwanese adolescents with depressive symptoms (Huang & Guo, 2009), Israeli school-aged children with aggressive behaviors (Ronen et al., 2007), and women caregivers of adults with mental illness (Zauszniewski et al., 2008). On the contrary, age and resourcefulness showed no relationship in studies of preadolescent girls (Cawley, 2001) and Thai adolescents (Panitrat, 2001). The empirical relationships between resourcefulness and gender showed mixed results as well. Women were more resourceful than men in some studies focusing on gender differences of resourcefulness (Brewin et al., 1996; Goff, 2011; Zauszniewski et al., 2001). However, some studies showed no relationship between gender and self-reported resourcefulness in studies of children and adolescents (Ronen et al., 2007; Preechawong et al., 2007; Zauszniewski, Chung et al., 2002).

**Extrinsic factors.** Empirical studies have documented that maternal resourcefulness, relocation, social networks, and social support (Bekhet et al., 2008; Dirksen, 2000; Zauszniewski, Chung et al., 2002; Zauszniewski et al., 2005) are included in extrinsic factors.

Extrinsic factors exist within the individual’s environment (Rosenbaum, 1990; Zauszniewski, 2006), which includes the family. Family is the first socialized group that children experience; therefore, the family context has a profound influence on children’s growth and development (Darling & Steinberg, 1993). Parenting styles influence children particularly with regard to self-efficacy, self-control skills, self-discipline, self-regulatory
ability, and effective coping (Brewin et al., 1996; Duckworth, 2011; Finkenauer et al., 2005; Gottfredson & Hirschi, 1990; Knoche et al., 2007; Power, 2004; Ronen, Wozner, & Rahav, 1992; Swanson et al., 2010; Turkel & Tezer, 2008). Hence, caregivers are particularly important in establishing early patterns of control, which can affect future development of resourcefulness.

Performing parenting is not an easy job, especially positive parenting. The demands of positive parenting increase with children’s growth and need for complete parental involvement with cognitive and behavioral skills in problem-solving (Sanders, 1999). Kennett et al. (2012) have documented that parenting resourcefulness measured by the Parent Resourcefulness Scale (includes factors such as positive self-statements, problem-solving strategies, and delay of immediate gratification) (Walker, 1990) was highly correlated with general resourcefulness measured by Rosenbaum’s (1980) Self-Control Schedule. Studies have proposed that children’s resourcefulness is developed within their family context (Preechawong et al., 2007; Rosenbaum, 1980; Turkel & Tezer, 2008; Zauszniewski, Chung et al., 2002); the caregivers’ levels of resourcefulness were hypothesized to be associated with their children’s in this present study. To date, only one published study examined the relationship of resourcefulness within the parent-child dyad and suggested a more highly resourceful child was more likely to have a highly resourceful mother (Zauszniewski, Chung et al., 2002). Hence, resourcefulness in the parent-child dyad warrants further examination.

**Process regulators (PRs).** PRs are intervening factors that may be influenced by contextual factors and have direct effects on resourcefulness (Zauszniewski et al., 2008). PRs are involved in the process of cognitive regulatory mechanisms, which people use to
evaluate particular situations that are under their voluntary control (Rosenbaum, 1990). In addition, PRs also include affective regulators like depressive cognition, emotions, and motivational regulators (Zauszniewski, 2006). Rong (2000) reported that the level of perceived stress was negatively correlated with resourcefulness among older adults in Taiwan. Positive cognition was also found to have a direct positive effect on resourcefulness in a group of elders who were relocated to retirement communities (Bekhet et al., 2008). In summary, there are cognitive, affective, and motivation processes that influence an individual’s ability to use resourcefulness skills. Three PRs, namely academic stress, dispositional optimism, and dispositional pessimism, were examined in the present study.

**Self-control behaviors.** In Rosenbaum’s theory of learned resourcefulness, self-control behaviors are affected by cognitive processes and refer to the ability and belief of coping independently with aversive situations in life by employing a collection of cognitive-behavioral strategies (Rosenbaum, 1990). Further, self-control is a process rather than an outcome, in where the individual evaluates his or her behaviors in order to control cognitions, emotions, and behaviors effectively (Rosenbaum, 1990).

Self-control behaviors can be redressive, reformatory, and experiential. These self-control functions, which can be complementary, are required for people to respond to unfamiliar or stressful situations (Rosenbaum, 1990; Zauszniewski, 2006). The redressive self-control occurs when “the person’s efforts are directed at resuming normal functioning that was disrupted” (Rosenbaum, 1990, p. 12), which means an individual may use positive self-instructions to self-regulate their internal responses (i.e. thoughts, cognitions, and emotions) that interfere with normal functioning (Rosenbaum, 1990).
Redressive self-control is important when coping with stress (Rosenbaum, 1993). With reformatory self-control, “the person’s efforts are directed at disrupting his or her customary way of functioning and adopting a new behavior” (Rosenbaum, 1990, p.12), which includes a collection of strategies such as problem-solving skills, strategies for postponing the need of gratification, and resistance of temptations such as dieting and quitting smoking (Rosenbaum, 1993). Experiential self-control is related to emotions and the opening up of oneself to new experiences; it is an individual’s ability to be sensitive and aware of feelings and of specific environmental stimuli when cognitive control processes are temporarily down in order to facilitate the generation of new behaviors, to reduce interference in current emotional experiences (Rosenbaum, 1993). People apply experiential self-control when engrossed in listening to music and relaxing (Rosenbaum, 1993). For example, parents can teach experiential self-control by presenting the child with music and dance and informing them of their benefits; the child can then learn to enjoy and relax from music and dance (Ronen, 1995). In addition to these three types of self-control, perceived self-efficacy (the belief in coping effectively) (Bandura, 1982) is also involved in self-control (Rosenbaum, 1990; Zauszniewski, Lai et al., 2006).

In summary, the purpose of self-control behaviors is to overcome self-generated negative feelings and thoughts, to delay gratification, and to cope with stress that all associated with desirable goals (Kanfer & Gaelick-Buys, 1991; Rosenbaum, 1990, 1993). Hence, highly resourceful people are able to use positive self-instructions, apply problem-solving strategies, and delay gratification when encountering stress. They can change by opening themselves to new experiences (Rosenbaum, 1993).
**Self-control in children.** The development of children’s self-control is closely related to social and cognitive development (Bronson, 2000). Children are born without self-control but acquire it gradually as they grow up; for instance, infants try to exercise self-control even though they have little or no self-control at all. Kochanska and associates (2000) noted that children can follow instructions to delay, alter, or slow down an action by age two. By age three, children can even use formal principles to control their behaviors in frustrating circumstances (Schulman, 2005). It is important for parents to provide sensitive care in an environment with predictable routines, which will help children develop self-control and regulate their emotions and behaviors (Levine & Munsch, 2011). To create an environment that supports children’s self-control and problem-focused coping is important to children’s growth and development.

As children grow, they show an increasing awareness of the strategies that facilitate various types of self-control (Kendall & Braswell, 1985; Ronen, 1992), such as calming themselves down, learning how to regulate and control behaviors and emotions (Levine & Munsch, 2011), and becoming better at delayed gratification (Kopp, 1982; McCabe & Brooks-Gunn, 2007). Self-control at a young age has been associated with a number of positive outcomes such as better regulation of emotions and behaviors as well as being more socially and academically competent (McCabe & Brooks-Gunn, 2007). Zauszniewski and colleagues (2002) reported that developing appropriate self-control skills helped children maintain mental health and to prevent depression. Mischel and colleagues (1988) revealed that adolescents’ cognitive and social competence was predicted by the amount of time they were able to wait for a reward during their early childhood. Moffitt and associates (2011) reported that childhood self-control predicted a
wide range of consequences later in life, including less negative behavior and better physical and mental health.

When performing goal-directed behaviors, children need self-control, especially if facing obstacles (Ronen & Rosenbaum, 2001). As children mature, their goals become increasingly distant (such as getting into a desirable college). Goals require breaking down plans into sub-plans and engaging in “thought experiments” in which courses of action are envisioned and evaluated mentally before actually being embarked upon (Schulman, 2005, p. 322). In other words, once children develop or learn self-control, they will start to overcome difficulties more, delay immediate gratification, control their behaviors, and gain a sense of self-efficacy (Kendall & Braswell, 1985; Hamama et al., 2000). Rosenbaum (1989) noted that children develop self-control behaviors and the ability to delay gratification simultaneously and reciprocally in the process of learning how to delay gratification. It is important for children to develop self-control skills. The acquisition of self-control skills enables children to identify their automatic, habitual way of thinking and change it into a mediated and planned way of thinking; in addition, it facilitates children’s recognition of the role of thought in emotional arousal, which allows the child to overcome disturbing emotions, learn the cause for their behaviors, and acquire effective techniques and skills for behavioral change (Ronen et al., 1995).

The ability to self-control continues to develop throughout childhood and into adolescence; thus, there are opportunities for interventions that can change the course of a child’s development before difficulties in having or maintaining self-control become persistent (Zhou et al., 2007). Such intervention may include helping children develop self-control and coping skills (Ronen, 2005; Ronen & Rosenbaum, 2001, 2010). It may
also include helping caregivers learn behavioral skills that support their children’s coping skills (Levine & Munsch, 2011).

*Children’s Resourcefulness Scale (CRS).* The self-control skills constituting resourcefulness are thought to be learned throughout life (Rosenbaum, 1990; Zauszniewski, 2006). Children’s resourcefulness was assessed by the Children’s Resourcefulness Scale (CRS) (Zauszniewski, Bekhet, & Bonham, 2010) in this present study. The 10-item CRS is refined from the 32-item Children’s Self-Control Scale (C-SCS) (Rimon, 1980; Rosenbaum & Ronen, 1991) and is a reliable and valid measure with acceptable internal consistency (Zauszniewski et al., 2010). Exploratory factor analysis (EFA) was done to identify a two-factor solution, problem-solving and delay of gratification, which were significantly correlated ($r = .44, p < .001$). This is consistent with Rosenbaum’s theory of resourcefulness (Zauszniewski et al., 2010). These two factors reflect two of the three factors identified in the literature of resourcefulness and in the adult measure of resourcefulness (Self-Control Schedule, SCS, Rosenbaum, 1980) (Rosenbaum, 1990, 1993). Delay of gratification can be reframed within the self-regulatory process (Bronson, 2000; Metcalfe & Mischel, 1999; Zauszniewski et al., 2010); hence, items reflecting delay of gratification can be treated as redressive self-control, and items reflecting problem-solving as reformative self-control. However, a factor reflecting self-efficacy did not emerge (Zauszniewski et al., 2010). This finding was not surprising since none of the C-SCS items, from which the CRS was developed, measured self-efficacy. In conclusion, the 10-item CRS was determined to be valid and reliable, and it should be helpful in assessing children’s self-control skills. In this present study, the 10-item CRS was translated into Mandarin Chinese and tested in fifth and sixth graders in Taiwan.
Resourcefulness. Resourcefulness is the keystone for the execution of self-control behaviors (Rosenbaum, 1990). Zauszniewski (2006) proposed that resourcefulness includes two forms: personal (self-help) and social (help-seeking) resourcefulness. Personal resourcefulness, also referred to as “learned” resourcefulness in Rosenbaum’s (1990) theory of resourcefulness, involves the cognitive-behavioral skills that individuals use to facilitate the performance of daily activities in order to maintain independence when facing aversive situations, and it consists of redressive self-control, reformative self-control, and perceived self-efficacy. Social resourcefulness involves help-seeking from other sources such as family, friends, or professionals when individuals have difficulty functioning independently (Nadler, 1990). Both forms of resourcefulness skills are equally important when maintaining and promoting health (Zauszniewski, 2006).

Resourcefulness scale (RS). The Self-Control Schedule (SCS) developed by Rosenbaum (1980) is a satisfactory measure used for assessing adults’ personal (self-help, learned) resourcefulness – a general repertoire of resourcefulness. The Resourcefulness Scale (RS) (Zauszniewski, Lai et al., 2006) measures both personal and social resourcefulness; this measure was used to examine caregivers’ resourcefulness in relation to the child variables in the proposed study. The RS is a reliable and valid measure containing 16 items reflecting personal resourcefulness (derived from Rosenbaum’s (1980) measure of learned resourcefulness, the Self-Control Schedule), and 12 parallel items reflecting social resourcefulness. A Chinese version of RS is available and shows a satisfied reliability (Au, 2009).

Resourcefulness skills. Multifaceted resourcefulness skills are required for behavioral change and goal attainment. According to Rosenbaum (1990) and
Zauszniewski (2006), resourcefulness, learned through life and beginning in early childhood, is a set of cognitive-behavioral skills that an individual can use to regulate stressful experiences with the goal of achieving, maintain, or regaining health; therefore, the collection of cognitive-behavioral skills may include positive self-instructions for managing emotional and physiological reactions, problem-solving strategies, abilities for delaying immediate gratification of needs, and beliefs in one’s ability to attain, maintain, or regain health (Rosenbaum, 1990; Zauszniewski, 2006).

*Skills of positive self-instructions and delay of gratification.* Both positive self-instructions and delay of gratification fall under the umbrella concept of self-regulation (Bronson, 2000; Mischel, Shoda, Rodriguez, 1989; Rosenbaum, 1993). Language has an important role for developing children’s self-control skills (Ronen, 1995). Vygotsky (1987) pointed out that language is the most important tool for self-regulation because self-regulation increases when verbalization becomes more internalized and directs toward the self. Belonging to the scope of problem-focused coping (Hampel & Petermann, 2006; Lazarus & Folkman, 1984), skills of positive self-instruction (e.g., I say to myself: ‘I can make it’) will need appropriate language development in order to work more efficiently. Preschool children gradually have had the ability to move their self-control from external into internal, and be able to use language to help to understand emotions and to internalize strategies to guide behaviors (Bronson, 2000). According to Rosenbaum (1990, 1993), a resourceful individual will use skills of positive self-instruction to self-regulate one’s own internal responses such as personal feelings and thoughts. This is a part of one’s redressive self-control skills.
Delay of gratification (e.g., dieting) is the capacity to postpone rewards that are immediately available to attain subsequent but more valued outcomes (Mischel et al., 1989). Delay of gratification has the nature of future-oriented self-control, and it develops over time and coexists with more impulsive behaviors (Hampel & Petermann, 2006). In order to self-regulate, individuals need to use skills of delaying instant gratification in order to overcome bad feelings, impulses, and barriers (Metcalfè & Mischel, 1999). Hence, individuals must voluntarily postpone instant gratification and persist in goal-directed behavior for a better outcome (Mischel et al., 1989).

The ability to delay gratification is associated with parenting style (Mauro & Harris, 2000); moreover, children learn self-regulation through delayed gratification and effective self-instructions to guide behaviors (Bronson, 2000). Consequently, children are more likely to exhibit effective delay gratification as they grow (Mischel & Mischel, 1983). Goal-directed, self-imposed delay of gratification is linked to a lower risk of overweight in children (Seeyave et al., 2009); it is also linked to better academic and social outcomes in adolescence (Eigsti et al., 2006), and it believed to be important in the prevention of developmental and mental health problems (Mischel et al. 1989).

**Problem-solving.** The conceptualization of problem-solving has its roots in Piaget’s notion of individuals’ adaptation to their environment (Piaget, 1952 as cited in Berg & Strough, 2011); hence, cognitive maturity is one of the key factors that influence the performance of problem-solving, and problem-solving has the characteristic of individual variability (Berg & Strough, 2011; Siegler, 2006). Successful problem-solving involves individuals achieving a better fit between themselves and the demands in the environment, and it usually involves the following processes: interpreting and defining
the problem or preventing the problem, setting goals in the problem-solving situation, generating and exploring strategies for solving the problem, and implementing strategies and evaluating their effectiveness (Berg & Strough, 2011). Although individuals at all ages are capable of adjusting their strategies in response to goals in the processes of problem-solving, it was found that older individuals were less adaptive or less flexible in finding strategies (Lemaire & Lecacheur, 2004). However, the lack of flexibility and adaptation may be due to the older individuals’ perceived efficacy to solve problems (Artistico, Cervone, & Pezzuti, 2003). Furthermore, Blanchard-Fields (2007) noted that emotional and behavioral self-regulations also play an important role in these problem-solving processes. Therefore, it is crucial to guide individuals at a young age regarding the flexibility and the variability of problem-solving strategies.

Children must learn to regulate their cognitive functioning, which is known as cognitive self-regulation, in order to develop rules and strategies for thinking and being capable of independent decision making and problem-solving (Bronson, 2000; Leventhal, Brissette, & Leventhal, 2003). Although research suggests that children spontaneously develop these capacities, the environment also plays an important role (Bronson, 2000). Thus, age- and experience-related changes influence children’s abilities to control attention and engage in self-directed thinking and problem-solving (Berg & Strough, 2011; Bronson, 2000; Siegler, 2006). In other words, both the maturation of the physical system and socioemotional experiences in the environment are important in the development of cognitive control (Bronson, 2000).

As children’s physical development reaches an increased range of abilities, they are able to gather information from the environment and cognitively cope with it
As children begin to understand their own cognitive skills, they can control them more; additionally, they can manage complex bodies of information and engage in complex thinking and problem-solving when their cognitive skills increase (Bronson, 2000). At age 6 or 7, they are able to direct and monitor their learning, thinking, and problem-solving activities reliably and independently (Bronson, 2000).

**Help-seeking.** Help-seeking is a problem-solving skill (Nelson-LeGall, Gumerman, & Scott-Jones, 1983) and a coping resource (Nadler, 1990). Seeking help may increase the probability that a particular problem will be solved (DePaulo, 1983). Nadler (1990) stated that help-seeking happens when an individual copes with difficulties by actively requesting assistance from others. According to Ames (1983), help-seeking is defined as “an achievement behavior involving the search for and employment of a strategy to obtain success” (p. 165); therefore, help-seeking is regarded as a proactive problem-solving strategy used by people who want to achieve desired goal. Help-seeking differs depending on age, gender, achievement level, and motivational level (Paris & Newman, 1990). For instance, as children grow, they seek help from parents, classmates, and teachers more (Paris & Newman, 1990), females seek and use help more often than males (McMullen & Gross, 1983; Nadler, 1983), and high achievers are more likely than low achievers to rely on others when they need assistance (Zimmerman & Pons, 1988). Students who seek help from classmates and teachers have learned the important social strategy of self-regulation (Ames, 1983). Newman (1994) documented that poorly regulated children are usually reluctant to ask for help.

**Self-Efficacy.** In Rosenbaum’s theory of resourcefulness (1990), self-efficacy is one of important components in self-control and refers to a general belief in one’s ability
to self-regulate internal events. Rosenbaum and Ben-Ari Smira (1986) stated that individuals will believe in self-efficacy after a successful execution of self-control skills.

Self-efficacy refers the judging of one’s capabilities to organize and execute courses of action to attain designated goals (Bandura, 1977), and is a key personal resource in self-development, successful adaptation, outcome expectations, and behavioral change (Bandura, 2006). More importantly, self-efficacy affects emotional self-regulation and one’s vulnerability to stress and depression (Bandura, 2006); in other words, the skills of self-efficacy facilitate an individual’s attempts to overcome stress and disturbing behavior and also to postpone gratification (Ronen et al., 1995).

Research noted that once children develop or learn self-control, they will start overcoming difficulties more and gain a sense of self-efficacy (Kendall & Braswell, 1985; Hamama et al., 2000). In other words, children’s self-efficacy changes substantially as they grow and move into a larger community, for example, with their peers (Bandura, 1994). As children become adolescents and shift from childhood dependency to adulthood independency and self-sufficiency (Smith, Cowie, & Blades, 1998), they are personally and independently expected to manage these diverse demands from the interactions with their environment; thus, it often leads to a loss of self-efficacy if children fail to regulate these demands effectively. Because the level of self-efficacy refers to its dependence on the difficulty level of a task, it is suggested that self-efficacy develops toward maturity up to the adolescent period (Zimmerman & Cleary, 2006).

**Empirical Evidences of Resourcefulness**

In various adult populations, a number of studies have concluded that greater resourcefulness was related to lower perceived stress (Au, 2010; Rong, 2000), minimized
depressive symptoms (Huang et al., 2010; Zauszniewski & Chung, 2001), fewer adverse effects from stressful life events (Wang, Rong, Chen, Wei, & Lin, 2007), lower sodium intake among hypertensive participants (Whelan, 2000), enhanced self-care (Kreulen & Braden, 2004), better coping with pain (Kennett, O’Hagan, & Cezer, 2008), a positive change in exercised behavior (Lévesque et al., 2003), a higher maternal role competence and satisfaction (Ngai & Chan, 2011), and a better quality of life (Huang et al., 2008; Zauszniewski et al., 2008). For example, Ngai and Chan (2011) examined the relationships among personal resourcefulness, social support, perceived stress, maternal role competence and satisfaction, and depressive symptoms in a group of Chinese primiparas. Their finding indicated that personal resourcefulness, also referred to as learned resourcefulness, was associated with a lower level of perceived stress, fewer depressive symptoms, and a higher level of social support and maternal role competence and satisfaction.

In adolescent and undergraduate students, a number of studies on resourcefulness documented that higher levels of resourcefulness were associated with fewer depressive symptoms (Huang & Guo, 2009; Liu et al., 2009; Moon et al., 2009), less amphetamine use (Panitrat, 2001), healthier behaviors (Birkimer et al., 1993), a higher self-esteem (McWhirter, 1997; Preechawong et al., 2007), more success in quitting smoking (Kennett, Morris, & Bangs, 2006), more positive body image (Kennett & Nisbet, 1998), more success staying in weight loss programs and exercise programs (Kennett & Ackerman, 1995; Kennett, Worth et al., 2009), better subjective well-being under threat of war (Ronen & Seeman, 2007), greater engagement in academic self-control behaviors (Kennett & Keefer, 2006; Kennett, Young et al., 2009), better ability to cope with
academic stress (Akgun, 2004; Akgun & Ciarrochi, 2003; Huang & Guo, 2009), and better academic achievement (Kennett & Keefer, 2006; Kennett, Young et al., 2009). For instance, Akgun and Ciarrochi (2003) examined the relationship between academic stress, performance, and learned resourcefulness; the results showed that learned resourcefulness moderated the negative association between academic stress and academic performance. Another study assessed the associations among adolescents’ resourcefulness, stressors, and depressive symptoms in Taiwan. This study revealed that resourcefulness was critical in decreasing depressive symptoms and suggested that there was a need for implementing effective cognitive-behavioral intervention programs to lessen the depressive symptoms and their negative consequences (Huang & Guo, 2009).

Literature on children’s resourcefulness is limited, and no studies of resourcefulness were found with children in Taiwan. Some studies found that highly resourceful children were less likely to experience stress, anxiety, and depressive symptoms (Chang et al., 2007; Hamama et al., 2000; Hamama et al., 2008) and to have lower rates of aggressive behavior (Ronen et al., 2007). In addition, they were more likely to have positive thoughts (Zauszniewski, Chung et al., 2002) and exhibit a better adaptive functioning (Chang et al., 2007). Furthermore, among girls aged 9-12, those who are highly resourceful were less likely to have unhealthy dietary behaviors (Cawley, 2001). Zauszniewski and colleagues (2002) found that school-aged children (aged 10-12) who had more negative thinking patterns were less likely to be resourceful than their counterparts. However, Guloglu (2006) found no difference in level of resourcefulness between negative and positive thinking patterns in fifth-grade students. Since resourcefulness is believed to start developing in early childhood with further learning
throughout life (Rosenbaum, 1990), research conducted in school-aged children needs more comprehensive investigation.

**Intervention Studies of Resourcefulness**

Intervention/educational programs on teaching resourcefulness skills/self-control skills to various populations have been proven beneficial for decreasing behavioral problems and promoting behavioral, physical, psychological, and socioemotional functioning (Ronen, 2005; Ronen & Rosenbaum, 2001, 2010; Zauszniewski, Bekhet, Lai, McDonald, & Musil, 2007; Zauszniewski, Eggenschwiler, Preechawong, Roberts, & Morris, 2006). According to Zauszniewski and Bekhet (2011), resourcefulness training consists of teaching personal (self-help) and social (help-seeking) resourcefulness skills; these skills need to be continuously practiced and reinforced. This training program includes positive self-talk, cognitive restructuring, positive behavior change, problem-solving, organization, reliance on family and friends, interpersonal exchange, and the seeking of professional help or expert advice. Zauszniewski and colleagues (2007) examined changes in affect, behavior, and cognition in chronically ill elders who were randomly assigned to Resourcefulness Training (RT) versus two other interventions. The findings revealed that the RT group displayed improved affect, cognition, and functional behavior; the results lasted for 12 weeks; hence, it was suggested that teaching resourcefulness skills to elders with chronic conditions may increase their adaptive functioning, thereby enhancing their quality of life.

Ngai, Chan, and Ip (2009) investigated the impact of a childbirth psycho-education program based on the concept of learned resourcefulness, which focused on cognitive restructuring, problem-solving, and efficacy enhancement on maternal role
competence and depressive symptoms in Chinese childbearing women. The findings showed that women receiving the psycho-education program had significant improvement in learned resourcefulness at 6 weeks postpartum (p = .004) compared with those who only received routine childbirth education (Ngai et al., 2009).

Another example of a clinical intervention study, conducted in Israel, aimed to develop self-control skills among children with oppositional defiant disorder (Ronen, 2005). This intervention program, based on the Self-Control Intervention Model (SCIM) (Ronen, 1994; Ronen & Rosenbaum, 2001) and derived from the perspective of cognitive-behavior theory, intended to teach children self-control skills for behavioral change. The self-control skills are based on the assumptions that human behavior is goal-directed, undergoes a process of change and development, and is associated with interactive factors that influence the process of self-regulating behaviors (Rosenbaum, 1990, 2000). The self-control training aimed to guide children through problem-solving and self-change skills that included cognitive restructuring and redefinition, rational analysis, and instruction in cause-effect links, intentional focus to increase awareness of internal stimuli related to anger and loss of control, and self-control exercise focusing on self-take, self-evaluation, and self-reinforcement (Ronen & Rosenbaum, 2001). The results revealed that children with oppositional defiant disorder benefitted from the program by developing self-control skills to effectively reduce their disruptive behaviors.

In summary, as Ronen (1995) suggested, self-control training is a promising and effective technique that can be used to solve children’s problems. Children can benefit from self-control training particularly to understand how to regulate internal events and to have behavioral changes when the deliberation of children’s developmental stage,
socioeconomic background, and the nature of problems is achieved while implementing the training program.

**Summary**

Since empirical and theoretical evidence shows that resourcefulness leads to positive health outcomes and a better QOL, understanding children’s resourcefulness is critical; childhood is the best time to establish healthy thoughts and habits and prevent difficulties in various aspects of development and enhance their adjustment.

“Helping children to help themselves” (Ronen & Rosenbaum, 2001, p. 338) is the foundation for pursuing a comprehensive understanding of children’s resourcefulness. This will help health professionals design effective and holistic intervention programs for children and their families. Subsequently, these populations will experience increased resourcefulness skills toward preventing difficulties, facing life challenges, and most importantly achieving a better quality of life.

**Dispositional Optimism/Pessimism**

**Optimism**

Individuals who possess optimism see their surroundings, lives, and futures positively (Scheier & Carver, 1985). Optimism represents certain cognitive aspects of an individual (Ben-Zur, 2003); in addition, optimistic individuals expect good things in life and perceive movement toward desirable goals as probable (Scheier & Carver, 1992; Snyder & Lopez, 2007). According to Seligman (1991), optimism is not when people change depressive thoughts so that they can feel warm for a moment; instead, it is a powerful tool to help individuals know themselves better, look deeper at the world, face challenges, solve problems, and achieve goals. Studies indicated that optimists have
better psychological and physical adjustment to difficulties than their pessimistic counterparts; likewise, optimistic people appear to accept uncontrollable situations more readily (Carver & Scheier, 1998; Scheier et al., 2001). In other words, optimistic people are capable to face and solve problems, and also know when to keep working at them and when to give up.

Optimism has been identified as both an explanatory style (optimistic explanatory style) (Seligman et al., 1996) and a thinking pattern of positive expectations for the future (dispositional optimism) (Carver & Scheier, 2003; Scheier & Carver, 1985). When defining optimism as an explanatory style, it refers to how an individual thinks about the causality of an event (Seligman et al., 1996) and how their expectations for the future stem from the experiences (Peterson & Seligman, 1984). Thus, an optimist will view there are other possible causes for an event based on his or her past experiences. Although both explanatory styles and dispositional optimism share the theme that expectations for the future affect people’s actions and experiences, not like the explanatory style, dispositional optimism focuses whether individuals think their outcomes will be good or not. To put it differently, dispositional optimism is individuals’ cognitive appraisals regarding their expectancies of reaching desired goals that is based on successfully handling previous challenges (Burant, 2006; Carver & Scheier, 2005). Empirical studies reported that the correlation between optimistic explanatory style and dispositional optimism was low; thus, they were considered as two different concepts (Chang, D’Zurilla, & Maydeu-Olivares, 1994; Hjelle, Belongia, & Nesser, 1996). This present study focused on dispositional optimism.
**Dispositional optimism.** Dispositional optimism is defined as the degree to which an individual expects to experience positive outcomes in life (Scheier & Carver, 1985). More specifically, dispositional optimism, one dimension of positive cognition (Brewin et al., 1996; Scheier et al., 2001), focuses on the expectations of future outcomes that is based on successfully handling previous challenges and is referred to an individual who has a general predisposition to appraise cognitively his or her daily stresses or difficulties in terms of potential growth and of a positive outlook on life (Burant, 2006; Carver & Scheier, 2005; Costello et al., 2002), the choice of coping strategies (Carver et al., 1989; Schou, Ekeberg, & Ruland, 2005), the initiation of preventive behaviors (Schwarzer, 1994), and perceiving the probability of moving toward desirable goals (Snyder & Lopez, 2007). In short, a dispositional optimist tends to accept the reality of the stress in uncontrollable situations, find the best in worst conditions, and be confident and persistent when facing challenges or coping with stress by using problem-focused coping and positive reframing (Carver & Scheier, 2005).

A number of studies have indicated that dispositional optimism was helpful in framing the positive side of beliefs, thinking, and behaviors and is associated with improved coping and psychological adjustment (Chong et al., 2006; Schwarzer, 1994). Furthermore, dispositional optimism has been positively associated with approach coping strategies aiming to manage stress; dispositional optimism has also been negatively associated with avoidance coping strategies aiming to avoid stress (Aspinwall & Taylor, 1992; Ben-Zur et al., 2000; Carver et al., 1993; Schwarzer, 1994; Solberg Nes & Segerstrom, 2006). Dispositional optimists tend to see positive outcomes as attainable and engage in proactive efforts; therefore, they are more likely to invest time into
achieving their goals (Carver, Scheier, Miller, & Fulford, 2009; Solberg Nes, Segerstrom, & Sephton, 2005). In addition, research has repeatedly shown the significant relationship between optimism and health habits as well as quality of life such as physical/psychological well-being (Carver et al., 1989; Scheier & Carver, 1992; Chang et al., 1994; Kostka & Jachimowicz, 2010; Friedman et al., 1995; Scheier et al., 1986; Schou et al., 2005). Furthermore, research has indicated that dispositional optimism was related to behavioral change (Schwarzer, 1994). Therefore, optimism may contribute to individuals’ well-being by buffering or mediating the effects of stress as well as promoting active coping and engaging in healthy behaviors.

**Dispositional optimism and dispositional pessimism.** Although studies have examined optimism and pessimism as a single bipolar dimension, indicating that greater optimism represents little pessimism (e.g. Cannella, 2006; Harper et al., 2007; Lancastle & Boivin, 2005), there are differences in how optimists and pessimists cope with adversity (Carver et al., 2009; Dember, Martin, Hummer, Howe, & Melton, 1989; Scheier et al., 2001). Hence, certain scholars have proposed that optimism and pessimism represent two correlated but independent characteristics (Chang & McBride-Chang, 1996; Lai, 1994; Milam, Richardson, Marks, Kemper, & McCutchan, 2004; Plomin et al., 1992); as a consequence, optimism and pessimism should be measured separately (Dember et al., 1989; Myers & Steed, 1999; Williams, Davis, Hancock, & Phipps, 2010). In general, optimists tend to expect good things to occur in life; in contrast, pessimists respond to adversity with more intense negative feelings. If someone is not optimistic, it does not mean he or she is pessimistic. In a study of children with cancer and healthy children, Williams and colleagues (2010) found that higher optimism was associated with
lower self-reports of pain and better emotional/behavioral functioning, whereas pessimism was related to poorer mental health and general behavior functioning.

Likewise, in a study with different ethnic groups of healthy adolescents, it was found that optimism was related to protective cardiometabolic biomarker profiles in non-Hispanic black adolescents; however, pessimism was inversely related to glucose only in non-Hispanic whites (Oreskovic & Goodman, 2012). Empirical findings have also shown that optimists were better adjusted to life difficulties than pessimists (Scheier et al., 2001).

**Dispositional optimism and behavioral self-regulation.** The construct of dispositional optimism arose from a behavioral self-regulatory framework in which positive expectancies lead to increased effort to attain desired goals (Solberg Nes & Segerstrom, 2006). Because dispositional optimism is a generalized form of positive expectancies, it is expected to predict engagement and effort across multiple contexts, including stressful circumstances (Carver & Scheier, 1998).

Carver and Scheier (2003) suggested that behavior is goal-directed and feedback-controlled. They applied expectancy-value theories of motivation and behavioral self-regulation to describe the dynamics that underlie optimism and how it influences human experiences and behaviors (Carver & Scheier, 2005). Based on this perspective, dispositional optimism explains how variations in expectations influence adjustment when people confront threats, including the following points: 1) confronting adversity can create eagerness to overcome difficulties; 2) whether a person is optimistic or pessimistic affects which emotions follow; and 3) people who are optimistic should have a set of relatively positive feelings even when facing difficulties (Rasmussen, Wrosch,
Scheier, & Carver, 2006). Hence, people with high optimism tend generally to expect positive outcomes across various life domains (Rasmussen et al., 2006).

Expectancy-value theories begin with the assumption that behavior is organized around the pursuit of goals, and goals are states or actions that people view as either desirable (goal) or undesirable (anti-goal, also called threat) (Carver & Scheier, 2005). In addition, the goal’s value is considered individualized and one’s motivation increases with the goal’s value; hence, people have no reason to act without having a goal that matters (Carver & Scheier, 2005). Expectancy, the mental simulation, is a sense of confidence or doubt about the attainability of goal (Carver & Scheier, 2001, 2005). Based on past experiences, the confidence loop yields a more optimistic outcome assessment than is being derived from current action (Burant, 2006; Carver, 2010; Scheier & Carver, 2003). Hence, only if people have enough confidence will they move into action and continue their efforts even in the face of great adversity (Carver & Scheier, 2001).

Behavioral self-regulation refers to individualized feedback control processes and involves efforts to control internal or external, mental or physical, activities (Carver & Scheier, 2003). This behavioral self-regulation includes elements such as an input function, a reference value, a comparator, and an output function (Carver, 2010; Carver & Scheier, 2003). An input function is the perception that brings information in. The reference value is a goal that represents a second source of information. The comparator, a device, is used to compare input and reference value. An output function refers to behaviors (Carver, 2010; Carver & Scheier, 2003). The reference values are the essential elements of problem-solving (Leventhal et al., 2003).
Two kinds of self-regulatory structures, discrepancy-reducing and discrepancy-enlarging, are used to describe the regulation of present states in relation to goal-approaching and threat-avoiding (Carver & Scheier, 2001). The former one aims at diminishing the differences between input and reference value in order to approach a valued goal, and the latter one aims at expanding differences in order to avoid a threat (Carver, 2010; Scheier & Carver, 2003). Both kinds of self-regulatory structures are essential to the system’s functioning; additionally, comparisons and evaluation of the effects of one’s self-regulatory actions would not be possible without it (Scheier & Carver, 2003). Regarding stress and coping, optimists take a goal-engaged approach to coping, whereas pessimists cope through disengagement (Carver et al., 2008). Consequently, a generalized optimistic orientation to life helps promote better adaptation to stress and enhances physical well-being (Scheier & Carver, 2003).

**Optimism/Pessimism in Children**

Individuals have visions of the future. As for children, the need to grow up with confidence, seize the opportunities society has to offer, learn flexibility, and be willing to confront challenges are all imperative for their physical and psychological well-being. Optimism would immunize children against depression and stress (Seligman et al., 1996).

Although optimism and pessimism are hypothesized to develop early in life, little is known about how and when these expectations emerge in children (Kliwer & Lewis, 1995). Basically, research suggests that children’s optimism/pessimism are established from early childhood experiences (Ben-Zur, 2003; Carver & Scheier, 1999). Four sources for the origins of optimism/pessimism have been proposed. The first source is genetics (Gillham & Reivich 2004; Plomin et al., 1992; Seligman et al., 1996). Twin studies
suggest that dispositional optimism/pessimism has a heritable component (Gillham & Reivich, 2004). The second one is the child’s environment his or her parents will have established; this includes parenting and attachment to parent figures (Ben-Zur, 2003; Carver & Scheier, 1999; Snyder, 2000). The third source is the child’s environment that relates to interactions with peers and other adults (Gillham & Reivich 2004; Roberts et al., 2005). A fourth way in which optimism/pessimism develops is through life experiences such as negative events (Gillham & Reivich 2004; Korkeila et al., 2004; Roberts et al., 2005; Scheier & Carver, 1993). As proposed by Snyder (2000), life without difficulty is unlikely to promote optimism because children need to face challenges to build skills and to develop the belief that they can conquer the challenges that will confront them in the future. In principle, younger children tend to see themselves and others in a more positive and optimistic way than those who older; younger children also may become more realistic and practical about positivity as they age (Schuster et al., 1998).

As children’s thinking moves from Piaget’s (1897-1980) preoperational to the concrete operational, and finally, to the formal operational stage, their thinking becomes increasingly governed by abstract schemas or rules; in addition, older children are capable of making causal attributions and think about the future more so than younger children (Gillham, Reivich, & Shatte, 2001). Thus, children’s interpretations of events are increasingly driven by cognitive styles such as dispositional optimism/pessimism as they approach adolescence (Gillham et al., 2001).

Even though there are benefits of being optimistic, optimism has its limitations (Seligman et al., 1996). It is suggested that children need to see things from realistic and practical perspectives so they can maintain automatic positive thoughts successfully.
(Kirschman et al., 2009). Schuster and colleagues (1998) stated that children become more realistic and practical about positivity when are older although younger children tend to be more positive than older children.

Despite the limited number of studies of optimism/pessimism in children, it is believed that being optimistic rather than being pessimistic is helpful in preventing some of the physical or psychological problems of childhood (Kirschman et al., 2009). Hence, optimism should be a valuable tool for children to use to face the challenges in daily life. Optimistic children tended to do better in school and had a better physical and mental health than their pessimistic counterparts (Seligman et al., 1996). Wyman and colleagues (1993) found that children who were optimistic would adjust better socio-emotionally at school and would have a more internal locus of control than whose who were pessimistic. In addition, the optimistic children were more likely to cope effectively in adverse situations when compared with their pessimistic counterparts (Scheier & Carver, 2003).

**Influencing Factors of Dispositional Optimism/Pessimism**

As described above, it is believed that there are sources for the origins of optimism/pessimism that can be grouped as individual characteristics (e.g. genetics and gender differences) and environmental factor (e.g. family context).

**Individual characteristics.** Studies have been suggesting that optimism/pessimism has a heritable factor (Gillham & Reivich 2004; Plomin et al., 1992; Scheier & Carver, 1993; Schulman, Keith, & Seligman, 1993); therefore, a significant correlation between parents’ and children’s scores on measure of optimism/pessimism is expected. Plomin and colleagues (1992) reported that about 23% of the variability in optimism and 27% of the variability in pessimism are due to heritability. Schulman and
colleagues (1993) also documented that explanatory style (optimism and pessimism) was significantly correlated in monozygotic twins but not in dizygotic twins. However, Seligman and colleagues (1984) found significant relationships only between maternal and child’s optimism. Studies found no relationship of dispositional optimism between parents’ and college students’ (Brewin et al., 1996) and between parents’ and children’s (Hasan & Power, 2002). Likewise, Ben-Zur (2003) found that adolescents’ and parents’ optimism had no significant associations although adolescents’ optimism was related to a positive relationship with parents.

Studies of gender differences and optimism/pessimism have shown mixed results. Studies of school-aged children found that girls reported higher levels of optimism than boys (Ey et al., 2005; Stipek, Lamb, & Zigler, 1981). However, Puskar and associates (2010) investigated the gender-related differences in optimism levels of rural adolescents and found that females scored lower than males in optimism ($p < .0001$). One study of undergraduates in Taiwan found that boys reported higher optimism than girls (Lee, 2004). Likewise, Huang and colleagues (2003) found that males had a higher level of optimism in children (aged 10-17). Conversely, no gender differences were found in samples of American and Jordanian college students (Khallad, 2010). Likewise, no gender differences were found between optimism/pessimism and school-life adjustment in junior high school students in Taiwan (Ting, 2002), the intention of preventive behavior in Chinese adolescents and adults (Lai & Cheng, 2004), and health in college students in the U.S. and China (Song, 2003).

As proposed by Schuster and colleagues (1998), younger children were more likely to be optimistic. Likewise, Giltay and associates (2007) reported that a higher level
of dispositional optimism was seen in younger male adults. Huang and colleagues (2003) revealed that age and the level of optimism were negatively correlated. Furthermore, Ting (2002) reported that older junior high school students were more pessimistic than younger ones. However, Ey and colleagues (2005) reported no significant differences in the levels of optimism between 3rd/4th and 5th/6th graders. Likewise, two studies in Chinese population found a comparable level of dispositional optimism among high-school students, undergraduates, and middle-aged adults (30–45 years); within all these groups, age was unrelated to dispositional optimism (Lai & Cheng, 2004; Lai & Yue, 2000). Interestingly, a cross-sectional study investigating age differences among American and Chinese adults found that older Americans displayed a higher level of dispositional optimism than younger Americans, whereas older Chinese showed a lower level of dispositional optimism than did younger counterparts (You, Fung, & Isaacowitz, 2009). Similarly, Ey and colleagues (2005) reported that African-American children endorsed higher levels of optimism than their Caucasian peers. And, Ghanaian women sampled had the highest scores among U.S. and Chinese women (Moyer et al., 2009). In addition, Barakat and Linney (1995) assessed optimism and coping in the adjustment of mothers and their children with spina bifida. They found that these mothers were less optimistic than those mothers whose children did not have spina bifida. Likewise, another study of optimism revealed that SES was not related to levels of optimism (Hirsch, Britton, & Conner, 2010; Stipek et al., 1981). In summary, although factors influencing optimism showed mixed results, it suggests that the relationship between underlying factors and dispositional optimism/pessimism may be shaped by various individual characteristics.
Environmental factor - family context. It is believed that optimism/pessimism is individualized and it develops through early childhood experiences within the family context (Ben-Zur, 2003; Carver & Scheier, 1999; Scheier & Carver, 1993). Better family functioning has been associated with higher levels of optimism. In addition, children of families with higher SES were reported to have a higher level of optimism than families with lower SES (Heinonen et al., 2006; Yen, 2007). Furthermore, parents have a strong influence on how children develop cognitively (John, Robins, & Pervin, 2008). Korkeila et al (2004) found that good parent-child relationships were associated with children’s dispositional optimism. In addition, parents with a higher level of SES and better family functioning would teach their children to think positively and be a problem-solver (Sahin, Nalbone, Wetchler, & Bercik, 2010; M. Wu, 2006). Consequently, children may develop the same positive thinking seen in their parents or through parents’ behaviors (Brewin et al., 1996). For example, Scheier and Carver (1993) indicated that parental instruction in problem-solving also influences the development of optimism/pessimism in children. Skills learned from parents – achieving success through effective coping and problem-solving may lead to positive expectations for future success (Scheier & Carver, 1993). Theoretically, if parents have a higher degree of optimism/pessimism, their children will as well. Therefore, it is important for parents to change their way of thinking if they are not optimists because children learn often from parents (Seligman et al., 1996).

Scholars have proposed that parenting is the most influential factor on an individual’s optimism/pessimism (Scheier & Carver, 1993; Snyder, 2000). Empirical evidence revealed that parenting was associated with children’s optimism/pessimism (Hasan & Power, 2002; Hjelle, Busch et al., 1996) although mixed results were found
(Brewin et al., 1996). For example, in a study of 81 mothers and their 8 to 12-year-old children, the findings showed that mothers’ pessimism, depressive symptoms, and parenting styles were significantly related to the level of optimism reported by their children (Hasan & Power, 2002). It was suggested that maternal modeling plays an important role on children's development of optimism and pessimism (Hasan & Power, 2002). Another study of undergraduates found that their optimism and perceived parenting was not correlated with each other (Brewin et al., 1996).

**Empirical Evidences of Dispositional Optimism/Pessimism in Adults and Adolescents**

A number of studies on dispositional optimism/pessimism in adults and adolescents have shown that optimists were more likely to have better physical and mental health, better health-promoting behaviors, successful behavioral change, and life adjustment than pessimists (Cassidy, 2000; Chemers, Hu, & Garcia, 2001; Giltay, Zitman, & Kromhout, 2006; Friedman et al., 1995; Gill & Loh, 2010; Kelloniemi, Ek, & Laitinen, 2005; Puskar et al., 1999; Schwarzer, 1994). Furthermore, optimism was associated with higher immune functioning (Segerstrom, Tayor, Kemeny, & Fahey, 1998) and lower mortality rates (Kubzansky, Sparrow, Vokonas, & Kawchi, 2001).

Research on optimism/pessimism among various populations has yielded interesting findings. Lobel and associates (2000) found that women who were the least optimistic had babies of the lowest birth weight, even when controlling for gestational age. A study of women with breast cancer found that being optimistic predicted a better quality of life at the 1-year follow-up than the pessimistic counterparts (Schou et al., 2005). Moreover, Tusaie and Patterson (2006) proposed that optimism is the most
influential cognitive factor in moderating life stressors in adolescents. Studies on Asian adolescents’ academic stress and psychological adjustment found that dispositional optimism had a significant negative relationship with academic stress and emotional distress, and it functioned as a mediator positive support from parents and peers and psychological adjustment (Chong et al., 2006; Huan et al., 2006). Likewise, Lai and Wan (1996) reported that optimistic undergraduate students were found to use more adaptive strategies than their less optimistic peers to cope with academic examinations. In another study conducted by Chemers and colleagues (2001) found that dispositional optimism directly and indirectly influenced life adjustment in a group of college freshmen.

**Empirical Evidences of Dispositional Optimism/Pessimism in Children**

There is ample research demonstrating the various benefits associated with optimism in adults and adolescents; however, research about the relationship of optimism and health in children is limited. Snyder and colleagues (1999) proposed that children who were hopeful about their ability to overcome challenges reported higher competence and lower depressive symptoms. Studies investigating dispositional optimism in children supported that those children who reported higher levels of optimism tended to have fewer symptoms of depression (Ey et al., 2005; Fischer & Leitenberg, 1986). Likewise, children who were optimistic about peer relationships were more likely to be viewed positively by their peers and less likely to be rejected (Deptula, Cohen, Phillipsen, & Ey, 2006). Interestingly, in relation to diet intake related variables, Taylor et al. (2004) reported that the higher optimism scored by girls aged 8-10 years was positively related to sweetened beverage preference and percent of calories from fat. However, no significant associations have been observed between pessimism and dietary-related
variables. Additionally, higher pessimism in girls aged 8-10 years was related to increased sedentary behaviors. Hence, children’s dispositional optimism/pessimism may influence the effectiveness of dietary behavior (dietary intake) change strategies and interventions.

To sum up, this is an important area for research because similar effects may be found in children. The current study planned to look at the relationship between children's physical symptoms and their optimism/pessimism.

**Intervention Studies of Optimism/Pessimism**

Although research has proposed that optimism/pessimism is a relatively stable due to its trait-like nature (Carver & Scheier, 2005), evidence support that optimistic orientation can be enhanced, trained, or manipulated with appropriate intervention such as cognitive behavioral therapy (Carver et al., 2010; Fosnaugh, Geers, & Wellman, 2009; Heigel, Stuewig, & Tangney, 2010; Meevissen, Peters, & Alberts, 2011; Peters, Flink, Boersma, & Linton, 2010; H.-Y. Wu, 2006; Wu, Chen, Chiu, Hsu, & Hsu, 2008).

Earlier, interventions have been developed aimed at targeting optimism defined as an explanatory style, in which interventions focused on changing explanatory style of past events and not directly on changing future expectancies. One longitudinal intervention study (Penn Optimism Program, POP) has been effective in reducing depressive symptoms for up to two years after the pessimism-decreasing intervention took place when run in small groups in schools with preadolescents targeted because of increased risk factors of depression (Gillham et al., 1995; Jaycox, Reivich, Gillham, & Seligman, 1994). Because decreasing pessimism does not guarantee optimism will be increase, Riskind and associates (1996) reported the implementation of an optimism
training program with undergraduates to increase positive cognitions and self-statements in order to foster optimism and motivate adaptive behaviors. They found that the students who received this training had significant improvements to optimistic interpretation, positive cognition, and problem-solving self-efficacy.

Recently, researchers have begun to search for intervention methods that directly target optimism-related cognitions (Fosnaugh et al., 2009; Heigel et al., 2010; Meevissen et al., 2011; Peters et al., 2010; Wu, Chen et al., 2008). For example, Fosnaugh and colleagues (2009) examined two different optimism manipulations, encouraging participants to generate thoughts about positive future and exposing participants to an optimism-priming task. They found that both optimism manipulations increased participants’ level of dispositional optimism. Peters and colleagues (2010) examined the effectiveness of method – the best possible self (BPS) (King, 2001), a positive future thinking technique – to induce dispositional optimism. It was found that BPS was able to increase individuals’ positive future expectancies. Furthermore, Meevissen et al. (2011) investigated the effects of BPS imagery intervention and found that BPS imagery enhanced levels of optimism after one session and over a two week period.

An optimism training program was designed for fifth-grade students in Taiwan to investigate the program’s immediate and long-term effects on children’s optimistic and pessimistic thinking (H.-Y. Wu, 2006; Wu, Chen et al., 2008). The finding indicated that this 6-week optimism-increasing training program immediately and continuously elevated students’ level of optimism (Wu, Chen et al., 2008); however, it did not improve their coping strategies (H.-Y. Wu, 2006). In addition, this optimism-increasing training program did not have any effect on decreasing children’s pessimism (Wu, Chen et al.,
In situations where optimism and pessimism were viewed as two different but correlated concepts (Carver et al., 2009; Chang & McBride-Chang, 1996; Chang et al., 1994; Dember et al., 1989; Scheier & Carver, 1992; Wu, Chen et al., 2008; Wu, Lin, Chen, Chiu, & Hsu, 2008).

In summary, although more studies are needed to examine the fidelity of optimism training programs, children should benefit from this kind of intervention program so they can increase their positive cognition and problem-solving self-efficacy.

**Measurement**

As research has suggested, optimism and pessimism should be assessed independently (Dember et al., 1989; Myers & Steed, 1999; Williams et al., 2010) since they are different but correlated concepts (Chang & McBride-Chang, 1996; Chang et al., 1994; Carver et al., 2009; Dember et al., 1989; Scheier & Carver, 1992; Wu, Lin et al., 2008). The most often applied measure of dispositional optimism is the revised Life Orientation Test (LOT-R) (Scheier, Carver, & Bridges, 1994). The unidimensional LOT-R has been shown to be a psychometrically sound measure and more reliable than the original version of Life Orientation Test (LOT) (Scheier et al., 1994). The variability of the LOT-R varies in different populations. For example, the correlation between the two factors (optimism and pessimism) of the LOT has been higher in American samples than in a Chinese sample (Lai, 1994); likewise, Americans showed greater optimism than Jordanians in a cross-cultural study (Khallad, 2010). Furthermore, Lai and Yue (2000) examined the effectiveness of a Chinese version of the LOT-R (CLOT-R) among Hong Kong and Mainland Chinese college students. They revealed different results from their confirmatory factor analyses. These findings suggested the issues of dimensions and
generalization of the LOT-R across cultures will need to be considered because similar effects when applying the LOT-R across cultures (Lai & Yue, 2000).

The 16-item Youth Life Orientation Test (YLOT) (Ey et al., 2005) was developed for children aged 9-12 years and is more advanced than the widely used LOT-R (Scheier et al., 1994). YLOT contains items for both optimism and pessimism, and it has acceptable reliability (Ey et al., 2005; Taylor et al., 2004).

The newly developed Optimism-Pessimism Scale (OPS) (Wu, Lin et al., 2008) was applied in this study. Based on the works of Carver and Scheier (1998, 2001, 2003), expectancy-value theories of motivation and behavioral self-regulation, the OPS was developed for assessing optimism and pessimism in Taiwanese fifth and sixth graders (Wu, Lin et al., 2008). Concurrent validity was demonstrated that the OPS and Chinese version of LOT (Wu, 1991) have a significant positive correlation (Wu, Lin et al., 2008). OS has been used in fifth and sixth graders in Taiwan and is psychometrical sound (Wu, Lin et al., 2008).

**Summary**

Several studies suggest that optimism/pessimism is an important factor to see how children deal with challenges. Few studies were found examining whether optimism/pessimism in children influenced healthy behaviors, as in the studies among adults. Furthermore, the impact and development of optimism/pessimism has not been fully investigated among children. Hence, the findings of this present study were expected to lay a foundation for further intervention and evaluation of programs to promote optimism and to enhance positive frameworks for children and for those with stress or special needs such as overweight and/or other chronic conditions.
Theoretical and Empirical Linkages

Academic Stress and Eating Styles

Although empirical studies analyzing associations among food intake, weight, and stress may have not reached entirely consist results (Braet et al., 2008; Caccialanza et al., 2004; Snoek, Van Strien et al., 2007; Torres & Nowson, 2007; Wardle et al., 1992), it is believed that individuals may vary in the extent to which they experience overeating responses to stress and/or distress, of which causes some individuals to change their eating behaviors and to consume food in excess of requirements and then this may culminate in weight gain and obesity (Chen et al., 2007; Levine et al., 1994; Martyn-Nemeth et al., 2009; Nguyen-Rodriguez et al., 2008; Serlachius et al., 2007; Talen & Mann, 2009).

Academic performance is a known stressor among children (Bossy, 2000; Leung et al., 2010). Researchers have suggested that, along with perceived stress, individuals use maladaptive coping strategies to deal with stress that contributes to the progression of unhealthy eating (Macht, Haupt, & Ellgring, 2005; Troop, Holbrey, Trowler, & Treasure, 1994). Either increasing or decreasing eating has been found useful as a coping strategy in response to stressful situations (Greeno & Wing, 1994; Lee, 2007; Oliver & Wardle, 1999). Some individuals may eat less when they feel stressed or depressed (Zesiewicz, 1992), whereas some may overeat because they need to feel a sense of gratification that overeating provides (Lee, 2007).

Macht and colleagues (2005) conducted a field study and found that students (aged 20-33 years) awaiting an exam reported higher emotional stress and an increased tendency to eat in order to distract from stress. Studies investigating the relationship
between perceived stress and eating behaviors in children and adolescents reported that the amount and quality of an individual’s diet and eating styles were likely to be deleterious with an increasing level of stress. Austin and associates (2009) revealed that adolescent girls aged 11-18 were more likely to have unhealthy dietary choices when under stress. Likewise, studies found that greater stress was related to a higher prevalence of disturbed eating behaviors in children (Cartwright et al., 2003; Jenkins et al., 2005). Studies found that increased stress was related to a higher prevalence of restrained and emotional eating in children and adolescents (Carper et al., 2000; Huang, 2008). In addition, restrained eaters aged 8-11, responded more to stress through eating (Roemmich, Wright, & Epstein, 2002).

Research has showed that the relationship between children’s academic performance and weight status was negatively correlated (Mo-Suwan et al., 1999; Tershakovec et al., 1994). In addition, better academic performance was more likely to be associated with healthier eating styles (Arnold & Doctoroff, 2003; Bradley & Corwyn, 2002; Fu et al., 2007; Kim et al., 2003). Academic stress influenced an individual’s health through changing health behaviors, such as eating behaviors (Austin et al., 2009; Chen et al., 2007; Levine et al., 1994; Martyn-Nemeth et al., 2009; Nguyen-Rodriguez et al., 2008; O’Connor et al., 2008). For instance, a study that investigated the association between academic stress and junior high school students in Taiwan revealed that academic stress was positively related with emotional eating (Huang, 2008).

Eating styles and overweight are correlated (Kleiser et al., 2009; Van Strien & Oosterveld, 2008; Ventura & Birch, 2008). Since eating has been found to be a coping strategy in response to stressful situations, school-age children who experience high
levels of academic stress may be at risk for developing unhealthy eating. Continued examination of these relationships is important to determine the role of stress on children’s eating styles.

**Academic Stress and Resourcefulness**

Research has documented the effect of resourcefulness on health-related behaviors. Within the academic and educational contexts, evidence showed that higher resourcefulness was related to better school performance in undergraduate students (Akgun & Ciarrochi, 2003; Kennett & Keefer, 2006; Kennett, Young et al., 2009) and school-aged children (Leung & He, 2010), and a lower level of anxiety in university students (Kennett, Young et al., 2009). For example, Kennett and associates (2009) examined the role of learned resourcefulness and anxiety in undergraduate students. They found that students who possessed a larger repertoire of resourcefulness skills and a higher self-efficacy were more likely to have self-control strategies and lower levels of anxiety from poor academic performance. Bandura and colleagues (1996) emphasized that children with a strong sense of self-efficacy were able to resist adverse academic stress. In one of the few studies that examined the relationship between academic stress and resourcefulness of school-aged children in China, results showed academic stress scores were negatively related to their resourcefulness scores (Leung & He, 2010).

**Dispositional Optimism/Pessimism and Eating Styles**

Dispositional optimism/pessimism has been studied with regard to health-related habits and/or behaviors. Research found that optimists reported more health-promoting behaviors than pessimists (Robbins, Spence, & Clark, 1991; Steptoe et al., 1994). Shepperd et al. (1996) reported that optimists were more likely to have lowered levels of
saturated fat and body fat than pessimists. Another study of coronary artery bypass patients five years after surgery found that more optimists took vitamins, ate low-fat foods, and enrolled in a cardiac rehabilitation program than pessimists (Scheier & Carver, 1992). Taken together, these studies suggest that optimism is related to healthier eating aimed at promoting health and reducing health risk.

**Dispositional Optimism/Pessimism and Resourcefulness**

Orr and Westman (1990) stated that both resourcefulness and optimism were rooted within the social learning approach. This approach should be able to help an individual stay healthy under stress. People who are positive tend to deal with obstacles or information in a creative and holistic way. Optimistic appraisal is the key for people to have the intention to gain personal resources so they can achieve their goals (Boekaerts, 1993). The relationship between dispositional optimism and resourcefulness, described by Rosenbaum (1990), claimed that optimistic individuals were more likely to appraise stressful disruptions as a way to promote self-control behaviors. Thus, resourcefulness and optimism were positively correlated (Brewin et al., 1996).

Few studies have directly investigated the relationship between resourcefulness and dispositional optimism/pessimism. In one cross-sectional study of undergraduates, dispositional optimism has been shown to correlate with resourcefulness (Brewin et al., 1996). In relation to coping, health, and quality life, a qualitative study examined symptomatic concerns of women with ovarian cancer. The study summarized that individuals who had the characteristics of resourcefulness and optimism were more able to share their creative coping strategies with varied sympoms (Ferrell, Smith, Cullinane, & Melancon, 2003). Other research has shown that optimistic people tended to take a
problem-solving approach persistently in controllable situations and reframed the situation in positive ways while coping with stressors when compared with the pessimistic counterparts (Carver & Scheier, 2005; Scheier et al., 2001; Scheier et al., 1986). In the workplace, optimists used more problem-focused coping (e.g. self-control and directed problem solving) than did pessimists (Strutton & Lumpkin, 1992). One study conducted with first- and second-graders showed that optimism was positively related to their locus of control, delay of gratification, attitude toward school, and self-concept (Stipek et al., 1981).

Brewin and colleagues (1996) stated that dispositional optimism is one type of positive cognition. In relation to positive cognition and resourcefulness, a study investigated the relationships among positive cognitions, depressive symptoms, and resourcefulness in women with diabetes, and found that positive cognitions were related to resourcefulness and positive cognitions mediated the effects of depressive symptoms on resourcefulness (Zauszniewski, McDonald, Krafcik, & Chung, 2002). Another cross-sectional study conducted in Egypt examined the effects of positive cognitions on the relationship between alienation and resourcefulness in students aged 17-20; the findings showed that positive cognitions had a moderating and a partial mediating effect on the relationship between alienation and resourcefulness (Bekhet, Elguenidi, & Zauszniewski, 2011). It is concluded that increasing positive cognitions is needed to better promote resourcefulness and enhance one’s health.

**Resourcefulness and Eating Styles**

Research found that, with repeated and successful attempts at self-control in a given domain, an individual might facilitate associative links between a specific
temptation and the overriding goal with which it interferes; therefore, restrained eaters may be successful in controlling their eating style and have lower BMI (Fishbach, Friedman, & Kruglanski, 2003; Papies, Stroebe, & Aarts, 2008). In a sample of children aged 9-12, Braet and Van Strien (1997) found that external eating had a significant negative relationship with an individual’s internal locus of control. Furthermore, a longitudinal prospective study also found that more self-controlled children were less likely to become overweight as they enter adolescence because the ability to control impulses and delay gratification enables them to maintain a healthy weight even in an obesogenic environment (Tsukayama, Toomey, Faith, & Duckworth, 2010). Another study with clinically obese adults found that poor self-control had the biggest influence on eating due to negative emotions as well as in response to external food stimuli, whereas attempted to control food intake and body weight seen in restrained eating were associated with more personal strengths (Elfhag & Morey, 2008).

A cross-sectional study examining children’s resourcefulness and eating behaviors in female children aged 9-12 found that greater resourcefulness skills were related with fewer dysfunctional eating attitudes and behaviors (Cawley, 2001). In adult populations, Kennett and Nisbet (1998) studied the influence of learned resourcefulness on body image perception in undergraduate women with normal weight. They concluded that highly resourceful individuals were less likely to have eating disturbances. Likewise, Leon and Rosenthal (1984) examined prognostic indicators of weight reduction and found lower resourcefulness would intensify emotional and external eating styles.

Lowe (1993) reviewed the effects of dieting on eating behaviors and suggested that highly resourceful restrained eaters would cope better with the cognitive disruption
caused by the preload of food, resulting in less preload-induced eating. However, Kirschenbaum and Dykman (1991) found that the level of resourcefulness did not influence restrained eaters in their experiment investigating whether resourceful restrained eaters avoided disinhibited eating.

It has been suggested that coping may serve as a mediator between stress and health outcomes such as eating behaviors (Austin et al., 2009; Braet & Van Strien, 1997; Chen et al., 2007; Martyn-Nemeth et al., 2009; Nguyen-Rodriguez et al., 2008; O’Connor et al., 2008). Studies of school-age children found that perceived stress was correlated with unhealthy eating because eating was a coping mechanism when dealing with stressful events (Chen et al., 2007; Jenkins et al., 2005). Likewise, a study of women with dysfunctional eating found that they were more likely to use emotion-focused coping and would not be willing to discuss problems with others (Troop et al., 1994).

In summary, having resourcefulness skills should be essential to defend against pressures as well as to maintain healthy dietary behaviors.

**Academic Stress, Stress, and Dispositional Optimism/Pessimism**

Stressful or depressive feelings influence an individual’s optimistic appraisal differently (Seligman et al., 1996). Optimists appraise daily stresses in terms of potential growth and tension reduction more than their pessimistic counterparts do; hence, optimists tend to accept their difficulties when faced with truly uncontrollable circumstances (Carver et al., 2008; Lai, 2009; Scheier & Carver, 2001; Scheier et al., 1986). Furthermore, optimism was found to contribute to immunological resilience during times of stress (Cohen et al., 1999). Optimism was also associated with higher
lymphocyte subset numbers and function, and it marginally predicted higher cytotoxic T cell numbers (Segerstrom et al., 1998).

Dispositional optimists tended to show less mood disturbance in response to a variety of stressors such as academic stress (Aspinwall & Taylor, 1992; Chong et al., 2006; Huan et al., 2006). Likewise, research reported that optimism was significantly and inversely related to the accumulated stress and depressive symptoms in their study samples of college students (Brissette, Scheier, & Carver, 2002; Chang & Sanna, 2003; Schulz, Vogele, & Meyer, 2009). In a sample of patients with ovarian cancer undergoing chemotherapy, dispositional optimism was inversely associated with perceived stress, anxiety, and depression (de Moor et al., 2006). Likewise, dispositional optimism was found to be negatively related to perceived stress in samples of adolescents in Spain (Extremera, Duran, & Rey, 2007) and African-American college students (Baldwin, Chambliss, & Towler, 2003). Furthermore, in a sample of Chinese adolescents, Lai (2009) found that optimism had a significant stress-buffering effect on mental health.

Taken together, these studies suggest that optimistic outcome expectancies might moderate the relationship between stress and psychological (Chang, 2002) and physiological outcomes (Lai, 1995). Hence, optimism might reduce a person’s susceptibility to subsequent illnesses, especially during times of stress.

Summary of Conceptual Linkages

In conclusion, the present study variables were linked according to reviewed theoretical and empirical literature. The purpose of this study was to explore the interrelationships among resourcefulness, academic stress, dispositional optimism/pessimism, and eating styles of fifth and sixth graders in Taiwan. Small
changes in a child's eating style can make a big difference. This review highlights the need to impart children with resourcefulness so they can increase their self-control skills, improve their coping with and adjustment to stressful situations, and promote their health outcomes and quality of life. No quantitative studies have been done to examine research variables simultaneously; thus, the study results were able to have contribution to the development of new knowledge regarding the interrelationships among study variables. In addition, findings of the current study further helped to expand the discussion of resourcefulness in pediatric populations. An empirical understanding of these phenomena will lay a foundation for designing individualized interventions that will benefit children and their families.
CHAPTER 3: METHOD

Introduction

This chapter presents a discussion of the study’s methodological issues. First, a description of the research design is included. Following is the discussion of sampling issues, including sample specification, recruitment method, sampling method, inclusion and exclusion criteria, and sample size determination, which is based on the power analysis. This chapter also discusses issues related to data collection procedures, the protection of human rights, and measures and measurements. Lastly, a discussion of the methods of data management and statistical analysis are described.

Design

A cross-sectional, descriptive and predictive correlational approach was used to answer the research questions. In general, cross-sectional designs can be used to describe associations among variables rooted in a theoretical model at a single point in time with no further follow-up (Hulley, Cummings, Browner, Grady, Newman, 2007). Likewise, such design provides rich information about naturally occurring phenomena that could not be seen in an experimental design (Burns & Grove, 2009). Thus, a cross-sectional design was appropriate to achieve the goals of the study.

A descriptive correlational design describes and explains the interrelationships that exist among study variables; it can also be used to examine variables within a theoretical framework (Hulley et al., 2007; Polit & Beck, 2012). Based on Burns and Grove’s (2009) work, a descriptive correlational design facilitates the description and identification of relationships among variables in a given situation without manipulating or controlling the situation. In addition to the descriptive correlational design, this study
was also predictive in that its aim was to explore the factors that predict or have an influence on another variable (Burns & Grove, 2009). However, since there was no manipulation or treatment involved in this study and the study’s focus was not on understanding causal relationships, a cross-sectional, descriptive and predictive correlational design was able to achieve the objectives of the study, which were to examine, explore, and predict the relationships among resourcefulness, academic stress, dispositional optimism/pessimism, and eating behaviors of fifth and sixth graders in Taiwan.

The purpose of the present study was to initiate the assessment of children’s resourcefulness and to clarify, examine, explore, and predict the interrelationships among selected variables. Expected findings can help health professionals to understand the phenomena and then be able to build a foundation for future tailoring of interventional-approach designs. A research model of this study is presented in Figure 1.2. Figure of 1.3 shows the proposed mediation study model.

**Sampling**

**Sample Specification and Recruitment**

In order to accomplish the purpose of the study and take children’s cognitive developmental stages and concentration levels into consideration (Borgers et al., 2000; Borgers & Hox, 2001), the target population consisted of children in grades five and six and their caregivers (e.g. parents or grandparents). The study considered the importance of the phenomena among fifth- and sixth-graders in Taiwan and the accessibility of the target population; hence, a community-based sample was recruited primarily from public elementary (primary) schools and their neighborhoods in two metropolitan areas in
Taiwan. Two metropolitan areas were selected in order to increase the diversity of potential participants, a method which made the population more heterogeneous, so the ability to generalize the findings to a larger target population would be enhanced (Burns & Grove, 2009). According to the Department of Statistics, Ministry of Education, Republic of China (Taiwan) (2011), there were approximately 25-29 students in each class in elementary schools in the 2009 school year, and each grade had 5-10 classes in these two metropolitan areas. Hence, the likelihood of recruiting enough participants from this source was inferred. However, in order to recruit enough eligible participants, the investigator also posted advertisements and disseminated flyers in these public elementary schools’ neighborhoods after getting permission from appropriate venues, such as in after-school activity centers and community centers. Participants were accepted from referrals by other participants, as well. Non-probability sampling was used to obtain a convenience sample in this study.

A convenience and non-probability sampling method was applied because of the accessibility and availability of the target population. Unlike probability sampling, convenience sampling may be likely to result in a non-representative referent group of the population (Waltz, Strickland, & Lenz, 2010). Nevertheless, a convenience sampling method is still practical and has its merits in exploring and understanding the phenomena being investigated (Burns & Grove, 2009). From a practical perspective, convenience sampling is expected to require less time and effort and cost less money (Burns & Grove, 2009). Additionally, this sampling method has been used in previous studies that examined relationships between resourcefulness and other variables among school-aged
children and adolescents (Preechawong et al., 2007; Zauszniewski, Chung et al., 2002). This sampling approach was able to meet the goal of the study.

**Inclusion and Exclusion Criteria**

Once the population of interest had been identified, specific inclusion and exclusion criteria were developed in order to provide guidelines for recruiting potential participants (Burns & Grove, 2009). Inclusion criteria describe the necessary characteristics for participants, and exclusion criteria eliminate the possible characteristics that might interfere with the findings of study (Burns & Grove, 2009).

School-aged children in fifth- or sixth-grade were recruited regardless of the variety of demographic characteristics. The study included those children who 1) had parents or grandparents as their primary caregivers, 2) had primary caregivers who signed the consent forms to participate in the study, and 3) were able to communicate in Chinese. School-aged children’s caregivers were recruited regardless of their demographic characteristics as well. The study included the caregivers who 1) were the children’s primary caregivers (i.e. parents or grandparents), 2) took care of the children most of the time, 3) were responsible for the children’s meals, 4) had children in fifth or sixth grades, and 5) were able to communicate in Chinese. Only the primary or responsible caregiver who was a parent or grandparent was included.

**Sample Size Determination**

Statistical power analysis is the best way to decide an appropriate sample size (Cohen, 1988, 1992). Power is “the probability that a statistical test will detect a significant difference that exists” (Burns & Grove, 2009, p. 460). Hence, the sample size needs to meet a satisfied number in order to achieve the minimum acceptable level of
power (Polit & Beck, 2012). Four essential components in a power analysis include power \((1 − β)\), significance level \((α\ level)\), effect size, and sample size (Cohen, 1988, 1992). Set three of the four components (power, significance level, and effect size) and then the fourth (sample size) can be calculated by power analysis formulas.

The power of a statistical test is the probability to reject the null hypothesis correctly and is defined as \(1 − β\), in which \(β\) is the probability of a Type II error (Corty, 2007). According to Polit and Beck (2012), the power of a statistical test is the “probability of detecting a true relationship or group difference” (p. 422). Hence, acceptable power is able to avoid the risk of making a Type II error (Polit & Beck, 2012). To put it simply, the risk of committing a Type II error is higher when a lower power is used in a study. However, a larger power would result in a demand for a sample size that is likely to exceed the resources of the research (Cohen, 1992). Cohen (1992) suggested setting the power at .80 \((β = .20)\), which is also a convention proposed for general use or in behavioral science research. A power level set at .80 will leave a 20% chance of making a Type II error, and a power level set at .90 will leave a 10% chance of making a Type II error. In this study, power was set at .80 as suggested by Cohen (1992).

The level of significance, referred to as \(α\), means the probability of wrongly rejecting the null hypothesis thereby bringing about a Type I error. It is easier to reject the null when \(α\) is larger (Corty, 2007); in other words, the risk of committing a Type I error is greater at the same time (Burns & Grove, 2009). The risk of making a Type I error will decrease if the level of significance \((α)\) is reduced (Burns & Grove, 2009). In other words, the risk of making a Type I error is smaller with a .01 level of significance than with a .05 level. The level of significance is usually set at .05 in most nursing studies.
and in behavioral science research (Burns & Grove, 2009; Cohen, 1988). Although the current study is a new area of research, and studies related to academic stress, dispositional optimism/pessimism, resourcefulness, and eating styles in children are limited, the level of significance could be set at a less rigorous level such as .10. However, considering previous study findings related to resourcefulness and the exploratory nature of the present study, the level of significance (α) was set at .05. Thus, there was a 5% risk of making a Type I error, and that should be acceptable in the present study.

Following the description above, the last component to get a sample size in power analysis formulas is effect size. The effect size is the strength of the correlation between the research variables (Burns & Grove, 2009; Polit & Beck, 2012). When effect size is large, it is easier to detect a relationship or the difference at a significant level in a small sample (Burns & Grove, 2009). Cohen (1992) has standardized effect sizes into small, medium, and large values depending on the type of statistical analyses employed. The effect sizes to test the significance of product-moment correlation coefficient (r) are .10, .30, and .50 for small, medium, and large, respectively; for t-test, the effect size (d) for small, medium, and large effect sizes are .20, .50, and .80, respectively; and for regression analysis, the effect size index (f²) are .02, .15, and .35 for small, medium, and large effect, respectively (Cohen, 1992, Table 1, p. 157). Cohen (1992) proposed that a medium effect size would represent an observable effect in behavioral science research.

The number of variables, types of research questions, and statistical methods need to be considered in order to determine an adequate sample size as well (Cohen, 1988). The appropriate statistical test to answer relationship-related research questions and the
scale of measurement of variables is ordinal/interval (e.g. RQ #4 interrelationships among major study variables) and was the Pearson product-moment correlation coefficient (Corty, 2007). While Cohen (1992) suggested that a medium effect size ($r = .30$) will be appropriate in order to answer relationship-related questions in behavioral science research, in reviewing the studies related to resourcefulness, most of the studies regarding resourcefulness and health-related behaviors indicated that resourcefulness has direct positive effects on health-related behaviors. Resourcefulness has been correlated with adaptive functioning in children ($r = .46, p < .001$) (Chang et al., 2007), fewer depressive symptoms in female adolescents ($r = -.37, p < .001$) (Huang et al., 2005), and mental health in female family members of mentally ill adults ($r = .53, p < .001$) (Zauszniewski et al., 2009b). Although no study has investigated the relationships among resourcefulness, academic stress, dispositional optimism/pessimism, and eating styles simultaneously in fifth and sixth graders in Taiwan, the investigator anticipated that the relationships would be at least as well correlated, but the directions of the relationships remained unknown. Therefore, to be more conservative, the $\alpha$ (two-sided) was set at .05, with power at .80, and effect size ($r$) of .30 for the present study. A sample size of 82 was needed as calculated by G*Power 3.1 (Faul, Erdfelder, Buchner, & Lang, 2009); this sample size allowed for the determination of statistically significant results using correlation coefficients.

The independent-samples t tests were used to assess the differences between dichotomous variable and ordinal/interval variable such as children’s gender (dichotomous variable) and eating styles (RQ #3) (Cohen, 1992; Corty, 2007). The power, $\alpha$ level, and effect size will be considered in determining the sample size for t-test
Setting a power level of .80, a medium effect size (d = .50), and α (two-sided) of .05, a total sample size of 128 was calculated by G*Power 3.1 (Faul et al., 2009).

Multiple regression was applied to assess the influence or effect of independent variables on a dependent variable (Burns & Grove, 2009; Hair, Black, Babin, & Anderson, 2009; Polit & Beck, 2012; Tabachnick & Fidell, 2012). More specifically, hierarchical multiple regression was used to evaluate the relationship between a set of independent variables and the dependent variable, controlling for or taking into account the impact of a different set of independent variables on the dependent variable (Hair et al., 2009; Tabachnick & Fidell, 2012). For example, the mediating effect of self-control behavior (children’s resourcefulness skills) on the relationship between process regulators (academic stress and dispositional optimism/pessimism) and target behavior (children’s eating styles – emotional, external, and restrained) was examined (RQ #8).

The power, α level, number of independent variables (predictors), and effect size will contribute to determining the sample size for regression analysis (Cohen, 1992; Cohen & Cohen, 1983; Tabachnick & Fidell, 2012). According to the proposed mediation study model (Figure 1.3), there were 12 predictors. Setting a power level of .80, a medium effect size ($f^2 = .15$), α (two-sided) of .05, and number of total predictors at 12, a sample size of 127 was calculated by G*Power 3.1 (Faul et al., 2009).

Studies with similar data collection procedures (children/adolescents complete questionnaires in class; caregivers complete questionnaires at home and return to homeroom teachers who then return the questionnaires to the investigator) had 80-94% response rates (Fu, Li, Yeh, Wang, & Lin, 2008; Liao, 2010; Wu, Yu, Wei, & Yin, 2003).
Taking different research questions, different statistical tests, different sample-size calculations, and attrition (20% non-response rate) (Fu et al., 2008; Hulley et al, 2007; Liao, 2010; Wu et al., 2003) into consideration, a conservative sample size would be 160 caregiver-child dyads with at least 128 cases for analysis. An additional ten fifth and sixth graders were asked to test the four new translated Chinese versions of measures (five each) to assess the measures’ appropriateness. Hence, a total of 180 children were recruited.

**Measurement**

Measurement is used to decrease subjectivity and has a specified set of rules (Polit & Beck, 2012). The quality of measurement depends on its psychometric properties, which include reliability and validity (Polit & Beck, 2012). The participants of this study involved children who were in fifth and sixth grades and their caregivers (e.g. parents or grandparents). Hence, the construction of questions, length of the questionnaires, and the ambiguity of items will need to be taken into consideration because of children’s cognitive ability, length of attention span, and burden while completing the questionnaire (Borgers & Hox, 2001; Borgers et al., 2000). Table 3.1 shows the psychometric properties of each measure and its level of measurement applied in this study.

Table 3.1.

<table>
<thead>
<tr>
<th>Variables/Concepts</th>
<th>Empirical Indicators</th>
<th>Psychometric Properties</th>
<th>Items</th>
<th>Level of Measurement</th>
</tr>
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<tr>
<td>Academic stress / Stress</td>
<td>Academic Stress Scale (ASS) (Leung, Yeung, &amp; Wong, 2010)</td>
<td>Alpha: .84 Face validity Criterion-related validity</td>
<td>8</td>
<td>Ordinal/Interval</td>
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Table 3.1.

Summary of Measurements (cont’d)

<table>
<thead>
<tr>
<th>Variables/Concepts</th>
<th>Empirical Indicators</th>
<th>Psychometric Properties</th>
<th>Items</th>
<th>Level of Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dispositional optimism/pessimism / Cognitive appraisal</td>
<td>Optimism Scale (OS) (Wu, Lin, Chen, Chiu, &amp; Hsu, 2008)</td>
<td>Alpha: .87 Test-retest: .81 Construct validity</td>
<td>12</td>
<td>Ordinal/Interval</td>
</tr>
<tr>
<td></td>
<td>Life Orientation Test-Revised (Chinese version) (CLOT-R) (Lai, 2003)</td>
<td>Alpha: .73 Convergent validity Discriminant validity</td>
<td>6</td>
<td>Ordinal/Interval</td>
</tr>
<tr>
<td>Resourcefulness skills / Resourcefulness (child)</td>
<td>Children’s Resourcefulness Scale (CRS) (Zauszniewski, Bekhet, &amp; Bonham, 2010)</td>
<td>Alpha: .72 Construct validity</td>
<td>10</td>
<td>Ordinal/Interval</td>
</tr>
<tr>
<td>Demographic variable / Individual (Intrinsic) Factors</td>
<td>Age</td>
<td>Self-report</td>
<td>1</td>
<td>Ratio</td>
</tr>
<tr>
<td></td>
<td>Gender</td>
<td>Self-report</td>
<td>1</td>
<td>Dichotomous</td>
</tr>
<tr>
<td></td>
<td>Weight</td>
<td>Self-report</td>
<td>1</td>
<td>Ratio</td>
</tr>
<tr>
<td></td>
<td>Height</td>
<td>Self-report</td>
<td>1</td>
<td>Ratio</td>
</tr>
<tr>
<td></td>
<td>Satiety Responsiveness (SR) (Wardle, Guthrie, Sanderson, &amp; Rapoport, 2001)</td>
<td>Alpha: .74-.83 Test-retest: .85 Factorial validity</td>
<td>5</td>
<td>Ordinal/Interval</td>
</tr>
<tr>
<td></td>
<td>Hunger/Satiety Cues (HSC) (Tylka, 2006)</td>
<td>Alpha: .72-.78 Test-retest: .74 Construct validity</td>
<td>6</td>
<td>Ordinal/Interval</td>
</tr>
<tr>
<td></td>
<td>School Performance</td>
<td>Self-report</td>
<td>1</td>
<td>Categorical</td>
</tr>
<tr>
<td></td>
<td>Children’s chronic condition(s)</td>
<td>Self-report</td>
<td>1</td>
<td>Dichotomous</td>
</tr>
<tr>
<td></td>
<td>Children’s medication(s)</td>
<td>Self-report</td>
<td>1</td>
<td>Dichotomous</td>
</tr>
<tr>
<td>Dispositional Optimism/pessimism (caregiver) / Environmental (Extrinsic) Factors</td>
<td>Life Orientation Test-Revised (Chinese version) (CLOT-R) (Lai, 2003)</td>
<td>Alpha: .73 Convergent validity Discriminant validity</td>
<td>6</td>
<td>Ordinal/Interval</td>
</tr>
</tbody>
</table>

150
Table 3.1.

**Summary of Measurements (cont’d)**

<table>
<thead>
<tr>
<th>Variables/Concepts</th>
<th>Empirical Indicators</th>
<th>Psychometric Properties</th>
<th>Items</th>
<th>Level of Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographics (caregiver)</td>
<td>Informant</td>
<td>Self-report</td>
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<td>Categorical</td>
</tr>
<tr>
<td>Gender</td>
<td>Self-report</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>Self-report</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>Self-report</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>Self-report</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height</td>
<td>Self-report</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SES</td>
<td>Self-report</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satiety Responsiveness (SR) (Wardle, Guthrie, Sanderson, &amp; Rapoport, 2001)</td>
<td>Alpha: .74-.83</td>
<td>5</td>
<td>Ordinal/Interval</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Test-retest: .85</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Factorial validity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total items (child)</td>
<td></td>
<td></td>
<td>72</td>
<td></td>
</tr>
<tr>
<td>Total items (caregiver)</td>
<td></td>
<td></td>
<td>81</td>
<td></td>
</tr>
</tbody>
</table>

**Dependent Variable**

**Eating styles.** Overweight and obesity are often due to poor eating behaviors in children and have drawn a lot of attention in society worldwide. Three styles of eating behaviors that are related to overweight and obesity have been identified: emotional eating style (eating in response to stress or negative emotions), external eating style (eating in response to external stimuli), and restraint eating style (eating less than desired in order to maintain or lose weight) (Van Strien et al., 1986). These three eating styles were assessed and screened by using the Dutch Eating Behavior Questionnaire for children (DEBQ-C) (Table 3.2) (Van Strien & Oosterveld, 2008). DEBQ-C is an age-adapted version of the DEBQ, which is intended for adults and adolescents and has shown good reliability and validity (Van Strien et al., 1986).

The DEBQ-C is a self-report questionnaire for assessing the eating styles of children aged 7-12 years old. There are three subscales and a total of 20 items included in the DEBQ-C (Table 3.2). A higher sum score indicates a higher degree of the specific
eating behavior, and each subscale has a 1-3 range of scores (1:no, 2: sometimes, and 3: yes). The emotional subscale of the DEBQ-C contains seven items, for example, “Does worrying make you feel like eating?” The external subscale consists of six items, for example, “Do you feel like eating whenever you see or smell good food?” There are seven items in the restrained subscale, such as “Do you intentionally eat less to avoid gaining weight?” The internal consistencies (Cronbach’s alpha) for the emotional, external, and restrained eating subscales were .80, .74, and .81 among children ages ranging from 7 years to 12 years, respectively. In addition, these subscales have satisfactory correlations (p < .01) with other measures such as perceived parental pressure and parental feeding styles (Van Strien & Oosterveld, 2008).

Table 3.2.

**The DEBQ-C and Three Subscale Scales**

<table>
<thead>
<tr>
<th>Subscales</th>
<th>Brief Definition</th>
<th>Number of Items</th>
<th>Cronbach’s Alpha</th>
<th>Example Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional eating</td>
<td>Eating in response to stress or negative emotions</td>
<td>7</td>
<td>.80</td>
<td>Does worrying make you feel like eating?</td>
</tr>
<tr>
<td>External eating</td>
<td>Eating in response to external stimuli</td>
<td>6</td>
<td>.74</td>
<td>Do you feel like eating whenever you see or smell good food?</td>
</tr>
<tr>
<td>Restrained eating</td>
<td>Eating less than desired in order to maintain or lose weight</td>
<td>7</td>
<td>.81</td>
<td>Do you intentionally eat less to avoid gaining weight?</td>
</tr>
<tr>
<td>Total items</td>
<td></td>
<td>20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Factorial validity or structural validity, one domain of construct validity (Motl, Dishman, Dowda, & Pate, 2004), refers to “the degree to which the measure of a construct conforms to the theoretical definition of the construct” (Hoyle & Smith, 1994, p. 432) and is considered an important component of establishing evidence for the
validity of inferences from test scores (Messick, 1995). DEBQ-C has shown a satisfied factorial that the fit measures for the three-factor model not only in the total sample but also in the multi-group models. Loadings of all the items were reported to exceed the .40 level, and the factor correlations are not significant with each other (Van Strien & Oosterveld, 2008).

Independent Variables

**Academic stress.** Academic stress is defined as “a disturbance induced by a student’s appraisal of academic stressors” (Leung et al., 2010, p. 90). Academic stress is common in Chinese society (Chang et al., 1993; M. Wu, 2006), and part of the reason is that parents place high expectations on their children’s academic performance (Bossy, 2000; Yang, 2007). Academic stress of children was assessed by the Academic Stress Scale (ASS), which is written in Traditional Chinese characters and was developed by Leung and associates (2010) in Hong Kong. Both Hong Kong and Taiwan have the same Chinese root and use Traditional Chinese characters in writing. The ASS is composed of eight items on a 4-point scale (1-4), with higher summed scores indicating a higher level of academic stress experienced by fifth and sixth graders. An item on the ASS reads, for example, “My parents consider that I have not tried my best in studying.” The Cronbach’s alpha was found to be .84 among 1171 fifth and sixth graders in Hong Kong (Leung et al., 2010).

According to Leung and colleagues (2010), face validity of the ASS was established by seeking comments from four professionals who have rich experience in working with preadolescent children. Further validity was verified by 30 fifth and sixth graders in a pilot test. Criterion-related validity was established by testing the correlation
with the Revised Children Manifest Anxiety Scale (RCMAS; Reynolds and Richmond, 1978). As a result, ASS was positively correlated with the RCMAS ($r = .54, p < .01$) (Leung et al., 2010).

**Dispositional optimism/pessimism.** Dispositional optimism and pessimism are often defined as the dispositional tendency to have either positive or negative expectations for the future (Carver & Scheier, 2005; Carver et al., 2010). There is a lack of consensus in the literature regarding whether optimism and pessimism are best construed as two separate constructs or as opposite ends of a single continuum.

Based on the definition of optimism/pessimism described by Carver and Scheier (2003), the Optimism-Pessimism Scale (OPS; Wu, Lin et al., 2008) (written in Traditional Chinese characters) was designed and developed for assessing optimism and pessimism of senior students (grades 5-6) in elementary school in Taiwan. The Optimism Scale (OS) is a subscale of the OPS, and there are also two subscales of the OS. The OS consists of twelve items (e.g., “I expect good things will happen to me”) on a 6-point scale (0-5), with higher summed scores indicating a higher level of dispositional optimism. Using a coefficient alpha, internal consistency of the OS was found to be .87 among fifth and sixth graders, and test-retest reliability (over two weeks) was .81 (Wu, Lin et al., 2008).

Construct validity of the OS was determined by confirmatory factor analysis that showed a good overall model fit with a two-factor model (Wu, Lin et al., 2008). Concurrent validity was established by the correlations with the Chinese version of LOT (Wu, 1991) and showed that there was a significant positive correlation between the two subscales of the OPS and the Chinese version of LOT ($r = .35 - .64, p < .01$) (Wu, Lin et
The Chinese version of the Life Orientation Test-Revised (CLOT-R) (Lai, 2003) was also used to assess children’s dispositional optimism/pessimism along with the OS. The CLOT-R contains six items and has been used in populations of Chinese adolescents and undergraduates (Lai, 2009; Lai & Cheng, 2004; Wu, Tsai, & Chen, 2009). Items in CLOT-R are back translations of corresponding items of the LOT-R (Scheier et al., 1994). LOT-R has been used in a group of children at 11 years of age to compare their social, emotional, and behavioral functioning between children of relatively short (height of < 10th percentile) and non-short (height of ≥ 10th percentile) groups (Lee et al., 2009). Details of the psychometric properties of CLOT-R will be described in a later section.

**Resourcefulness skills.** Resourcefulness skills, learned through life and beginning in early childhood, designate a set of self-control skills directed at regulating stressful experiences in order to achieve, maintain, or regain health (Rosenbaum, 1990; Zauszniewski, 2006). Refined from the Children’s Self-Control Scale (C-SCS) (Rimon, 1980; Rosenbaum & Ronen, 1991), the Children’s Resourcefulness Scale (CRS) (Zauszniewski et al., 2010) was used to assess children’s use of resourcefulness skills in daily life. The CRS is composed of 10 items on a 6-point scale (0 not at all like you to 5 very much like you), for example, “I make mistakes because I work too fast.” Ratings are summed to obtain an overall score (between 0 and 50) with a higher summed score indicating a greater degree of resourcefulness. The internal consistency (coefficient alpha) of the Children’s Resourcefulness Scale (CRS) was found to be .72 among 122 fifth and sixth graders (Zauszniewski et al., 2010). Construct validity was supported by using factor analysis examining the correlations between the 10-item CRS and measures of 32-
item C-SCS (Rosenbaum & Ronen, 1991) \( (r = .86, p < .001) \), positive automatic thoughts \( (r = .38, p < .001) \), and depressive symptoms \( (r = -.32, p < .001) \) (Zauszniewski et al., 2010).

**Intrinsic contextual factors (individual child’s characteristics).** Children’s individual characteristics, including their age (in years), gender (male/female, dichotomous), BMI (weight and height), hunger/satiety, chronic condition(s), chronic medication(s), and school performance, were collected by self-report. School performance referred to the child’s average grade in class from the previous semester. Caregivers’ reports regarding children’s chronic conditions and medications were collected for descriptive purposes but were not included in the analysis of the children’s characteristics (intrinsic factors).

Hunger/satiety refers to one of the appetitive traits and indicates the ability of a child to regulate food and energy intake (Wardle et al., 2001). Satiety responsiveness (SR), a subscale of the Children’s Eating Behaviour Questionnaire (CEBQ) (Wardle et al., 2001), was used to assess a child’s hunger/satiety based on a parent’s perception. Satiety responsiveness is a parent-rated measure and contains 5 items on a 5-point scale (1 = never and 5 = always), for example, “My child has a big appetite.” With appropriate reverse coding, higher values indicate stronger satiety responsiveness from the parent’s perception. Internal consistency (coefficient alpha) of the SR ranged .74-.83 in two samples, and test-retest reliability (over two weeks) was .85 (Wardle et al., 2001).

Child’s perception of satiety was assessed with the modified SR. The CEBQ measures different dimensions of a child’s eating behaviors based on parent’s perception. Hence, the modified SR was adapted from the SR of CEBQ (Wardle et al., 2001) to
measure child’s perception of satiety. Items of the modified SR were read, for example, “I have a big appetite.” The scoring method remained the same as the parent-rated SR, and a higher summed score indicates a higher level of satiety responsiveness.

In order to have a full understanding of children’s internal cues of hunger and satiety, the Hunger/Satiety Cues (HSC) (Tylka, 2006) was used as a second measure to assess children’s hunger/satiety. There are three subscales of the Intuitive Eating Scale (IES), which was developed to measure adaptive eating behavior on disordered eating in the adult population (Tylka, 2006). The HSC, a subscale of the IES, indicates awareness and use of hunger and/or satiety cues to determine when and how much to eat. No study was found in which the HSC was used among pediatric populations; hence, items of the HSC were modified in order to be age appropriate for children. The HSC consists of six items on a 5-point scale (1 strongly disagree to 5 strongly agree), for example, “I can tell when I’m slightly full.” Higher scores indicate more positive eating behaviors. The HSC has acceptable test-retest reliability (3-week period, $r = .74, p < .001$), construct validity, and internal consistency values ranging from alpha = .72 to .78 among varied adult samples (Tylka, 2006).

**Extrinsic factor – caregivers’ resourcefulness skills.** According to Zauszniewski (2006), personal and social are two forms of resourcefulness that are equally important in achieving, maintaining, or regaining health. Developed by Zauszniewski and associates (2006), the Resourcefulness Scale (RS) consists of items that reflect personal resourcefulness and social resourcefulness and was used to examine a caregiver’s degree of resourcefulness skills. The personal resourcefulness subscale contains 16 items; an example item reads, “When I am faced with a number of things to
do, I usually plan my work.” The social resourcefulness subscale contains 12 items; an example item reads, “When it is hard to me to make a decision, I ask someone to help me think things through.” All items are phrased positively; hence, scores are summed directly to obtain an overall score, ranging from 0 to 140, with a higher score indicating greater resourcefulness (Zauszniewski, Lai et al., 2006). The internal consistencies (Cronbach’s alpha) have been found to be satisfactory on the total scale and the personal and social resourcefulness subscales were .85, .83, and .79 among older adults, respectively (Zauszniewski, Lai et al., 2006). Construct validity was examined by confirmatory factor analysis and showed a two-factor loading and reflected a good representation of the theory of resourcefulness. Further construct validity was determined by the correlations within the two subscales and showed a significant positive correlation ($r = .41, p < .001$) (Zauszniewski, Lai et al., 2006). A Chinese version of RS is available that was translated by Au (2009). The Cronbach’s alpha has been found to be satisfied on the total scale and was .88 among 120 adult Taiwanese participants (Au, 2009).

**Extrinsic factor – caregivers’ dispositional optimism/pessimism.** A significant relationship between caregivers’ and children’s dispositional optimism/pessimism was assumed because it is believed that genetic factors may influence the development of optimism/pessimism (Gillham & Reivich 2004; Plomin et al., 1992; Scheier & Carver, 1993). In the current study, caregivers’ dispositional optimism/pessimism was measured using the Chinese version of the Life Orientation Test-Revised (CLOT-R) (Lai, 2003). The CLOT-R is a self-report measure that consists of six items. Items in the CLOT-R are back translations of corresponding items of the LOT-R (Scheier et al., 1994) except the second item, which was modified by Lai (2003) to reflect more precisely a non-
expectancy of positive outcomes. The original item “If something can go wrong for me, it will” was replaced by the new item “Looking into the future, I do not see any positive scenarios.” The CLOT-R uses a 5-point scale (0-4), ranging from “strongly disagree” (0) to “strongly agree” (4). After reversing the negative items, a higher summed score indicates a higher level of dispositional optimism, and a lower summed score indicates a higher level of pessimism because the CLOT-R treats dispositional optimism/pessimism as a single continuum (Lai, 2003). The internal consistency (coefficient alpha) of the CLOT-R was found to be .73 in a sample of 67 Chinese adults with coronary heart disease (Chan, Lai, & Wong, 2006).

Convergent and discriminant validity was determined by the correlations with the Chinese version of the original LOT (CLOT) and the Chinese Hopeless Scale (C-HOPE) (Lai & Yue, 2000). The correlation coefficient of the CLOT-R and CLOT was \( r = .93 \) \( (p < .01) \), whereas the correlation coefficient of the CLOT-R and C-HOPE was \( r = -.47 \) \( (p < .01) \) (Lai & Yue, 2000).

**Extrinsic factor – caregivers’ eating styles.** As described above, overeating styles (emotional, external, and restrained) might be related to overweight and obesity (Van Strien et al., 1986). Studies have suggested that genetics may play an important role in influencing individuals’ overeating behaviors (Davison & Birch, 2001; de Castro, 2006; Faith, Keller et al., 2004; Fisher et al., 2007; Tholin et al., 2005). Caregivers’ overeating styles were assessed by the DEBQ (See Table 3.3) (Van Strien et al., 1986).

The DEBQ is a valid self-report measure for assessing emotional, external, and restrained eating styles (Van Strien et al., 1986) among adolescents (Braet et al., 2008; Van Strien et al., 2010) as well as obese and non-obese adults (Van Strien, Herman, &
Verheijden, 2009). There are 33 items in the DEBQ (See Table 3.3), 13 on emotional eating (e.g., “Do you have a desire to eat when you are irritated?”), 10 on external eating (e.g., “If you see or smell something delicious, do you have a desire to eat it?”), and 10 on restrained eating (e.g., “Do you deliberately eat less in order not to become heavier?”). Each subscale uses a 5-point scale with response categories that range from 1 ‘never’ to 5 ‘very often.’ A higher sum score indicates a greater tendency toward a specific eating style.

Table 3.3.

The DEBQ and Three Subscale Scales

<table>
<thead>
<tr>
<th>Subscales</th>
<th>Brief Definition</th>
<th>Number of Items</th>
<th>Cronbach’s Alpha</th>
<th>Example Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional eating</td>
<td>Eating in response to emotional arousal such as stress, anxiety, or negative emotions</td>
<td>13</td>
<td>.96</td>
<td>Do you have a desire to eat when you are irritated?</td>
</tr>
<tr>
<td>External eating</td>
<td>Eating in response to external food stimuli</td>
<td>10</td>
<td>.85</td>
<td>If you see or smell something delicious, do you have a desire to eat it?</td>
</tr>
<tr>
<td>Restrained eating</td>
<td>Eating less than desired in order to maintain or lose weight</td>
<td>10</td>
<td>.92</td>
<td>Do you deliberately eat less in order not to become heavier?</td>
</tr>
<tr>
<td>Total items</td>
<td></td>
<td>33</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The internal consistencies (Cronbach’s alpha) for the emotional, external, and restrained eating subscales were .96, .85, and .92 in a sample of 1342 general adult population, respectively (Van Strien et al., 2009). The DEBQ has also shown good factorial validity (Van Strien et al., 1986; Van Strien, Herman, Engels, Larsen, & Van Leeuwe, 2007; Van Strien, Engels, Van Staveren, & Herman, 2006). In addition, these subscales have satisfactory correlations (p < .01) with other measures such as the
perceived parental pressure and parental feeding styles (Van Strien & Oosterveld, 2008). The scale of restrained eating has also shown good predictive validity for restriction of food intake (Van Strien et al., 2006; Van Strien et al., 1986). The DEBQ has been used in a sample of nurses in Hong Kong to examine the association between shift duty and eating behaviors and has shown acceptable psychometric properties (Wong, Wong, Wong, & Lee, 2010). The Traditional Chinese version of the DEBQ is available from Dr. Van Strien (2005), published by the Boom test uitgevers, Amsterdam, The Netherlands. One of the subscales, the emotional eating (Chinese version), has been used in a group of Taiwanese junior high school students and showed a satisfactory Cronbach’s alpha (alpha = .95) (Huang, 2008).

**Caregiver’s demographic questionnaire.** The Caregiver’s Demographic Questionnaire was developed by the investigator to include caregiver’s demographic characteristics as well as children’s chronic condition(s) and medication(s). The Caregiver’s Demographic Questionnaire included the primary caregiver’s relationship with the child (mother, father, or other that needs to be identified), age (in years), gender (male/female, dichotomous), the highest level of education (completed elementary school, junior high school, high school, college, master’s, or doctorate; categorical), occupation (self-reported), family income (average monthly household income, New Taiwan dollars), body weight (kilogram), height (centimeter), and the child’s chronic health condition(s), and medication(s). To assess the child’s chronic health condition(s) and medication(s), primary caregivers were asked whether their child had certain condition(s) (yes/no). The primary caregivers were asked to list the condition(s) and/or medication(s) the child had such as cardiovascular diseases, asthma, diabetes, or others. After data collection was
completed, the caregiver’s education level was assessed as completed education in years, for instance, completed elementary school is 6 years of education.

**Measurement Translation**

Nine measurements (SR, HSC, ASS, OS, CRS, DEBQ-C, RS, CLOT-R, and DEBQ) were used in this study. Mandarin Chinese is the national language, and Traditional Chinese characters are used in Taiwan. ASS and OS were designed for the Chinese population and written in Traditional Chinese characters. The CLOT-R is a Chinese version of the LOT-R (Lai, 2003). The RS has been translated into Traditional Chinese and has been used in the Taiwanese population (Au, 2009). The DEBQ has a Traditional Chinese version and is available from Dr. Van Strien (2005), published by the Boom test uitgevers, Amsterdam, The Netherlands. Only four measurements, SR, HSC, DEBQ-C, and CRS, needed to be translated into Chinese by using the well-established translation and back-translation process (Brislin, 1970). The goal of measurement translation is to assure the equivalence in varied aspects between source and target versions (Behling & Law, 2000; Brislin, 1970); further, the translated version needs to fit in the linguistic and cultural environment (Brislin, 1986). Hence, the procedures involved the following steps (Behling & Law, 2000; Brislin, 1970; Sperber, 2004). First, two bilingual nursing professionals with doctoral or master’s degrees who are familiar with the study populations (school-aged children) and the content of the instruments were invited to translate these two measures from English (source version) into Chinese (target version). These two translators worked separately to produce target versions. Second, the panel of translators and another bilingual nursing professional with a doctoral degree were all invited to review the translated materials and identify discrepancies in order to
determine the best translation for each item. After the translated Chinese version was
determined, it was reviewed by a monolingual person who is an elementary school
teacher and is not aware of the content of the source version in order to make the target
version meet fifth and sixth graders’ cognitive development and to avoid
incomprehensible wordings. Third, this reviewed Chinese version was then back-
translated into an English version by other bilingual nursing experts who are not familiar
with the content of the measure and were blinded to the original English version. Lastly,
a panel of experts who are experienced in pediatric nursing was asked to compare and
examine discrepancies between these two versions (original English and back-translated
English versions) for culturally valid and linguistic congruence. As requested by the
developer of the DEBQ-C, the back-translated English version was then sent back to the
developer (Dr. Van Strien) for further validating. The process was repeated until the
translated (target) version was satisfactory. In addition, each of these four final Chinese-
version measures was tested in a group of five fifth and sixth graders to assess
appropriateness. The results of the pre-test were used to revise the Chinese version of
measures if needed.

Data Collection Procedures

Both children and their caregivers were invited to participate in the study. The
investigator first contacted principals or the personnel who are responsible for student
affairs in public elementary (primary) schools in Taiwan to explain the purpose of the
research and the data collection procedures. Next, the investigator obtained approval
from Case Western Reserve University’s Institutional Review Board (IRB), and then the
investigator began data collection procedures.
After obtaining approval from school authorities and Case Western Reserve University’s IRB, the investigator contacted fifth and sixth graders’ homeroom teachers to ask for their assistance with accessing potential student participants. At the time of these meetings with homeroom teachers, the investigator introduced the study and explained the data collection procedures to them; in addition, an introduction letter was provided for their reference. After obtaining the homeroom teachers’ agreement to help in the recruitment process, an introduction letter was sent by the homeroom teachers to the parents of children in their class. The introduction letter included a brief description of the study’s purpose and procedures, and the investigator’s contact information. In addition, the introduction letter told the parents/caregivers of the children that their children would hear about this study within the next few days and would be asked to take home a packet containing more detailed information to their parents within their “agenda book” (daily homework and school schedules). Hence, before having any contact with the children, their caregivers (i.e. parents) would have received the introduction letter from their children’s agenda book, have had information about the study, have had time to think about participation in the study, and would have had the opportunity to contact the investigator if they had questions or concerns.

Each class had two to four sessions (40 minutes each) a week that homeroom teachers were able to use freely for alternative activities. Thus, the data collection with the children was coordinated with their homeroom teachers and took place during these sessions. In the setting of these fifth and sixth graders’ classes, the homeroom teacher introduced the investigator to the class. The investigator explained the following things to the children in the class before collecting the children’s and their caregivers’ contact
information: the study’s purpose, procedures, risks and benefits, and that their responses would be kept confidential. Time was provided for the children if they had questions or concerns. In addition, the children were assured that their participation was voluntary, and that refusal to participate would not affect their grades or relationships with peers and teachers, and that they had the right to withdraw from the study at any time. After introducing and explaining the study to the children, they were asked to take home the sealed package with their agenda books. The sealed package contained the invitation letter, consent forms, child assent, both caregiver’s and child’s questionnaires.

The agenda book is a notebook that the child has to carry everyday. The agenda book functions not only as a communication channel between teachers and caregivers but also lists what the assignments are for the day and what the children need to bring to school the next day. In addition, caregivers are required to check the agenda books and then sign them every day. The homeroom teachers will also need to check the agenda books every day. Asking children to take the sealed package home with the agenda book was able to increase the possibility that caregivers did see or receive the package because otherwise, the children may have forgotten to tell their parents/caregivers about this package.

Depending on their willingness to participate, the caregivers or children either left the forms blank if they did not want to participate, or, if they did wish to participate, the caregivers would give approval for their children’s participation, both caregivers and children would sign the consent forms, and the caregivers would then complete their questionnaires at home, leaving children’s questionnaire blank, and returning these five documents in the sealed envelope via the children back to their homeroom teachers.
within one week. Then, the homeroom teachers notified the investigator to collect these returned packages. Reminder letters were sent within the children’s agenda books if packages were not received by the investigator. If needed, children were asked again to take home another sealed package within their agenda book in order to further encourage the caregivers to participate in this study. Hence, a master identification list was created to link code numbers of questionnaires and student IDs. It was necessary to create the master identification list in order to identify who would need to take home the package again. Once collecting all of the returned packages, the investigator knew how many children and their caregivers were willing to participate in the study in this class.

In keeping with the regulations of the IRB at Case Western Reserve University, the child was not recruited if the caregiver did not grant permission to his/her child’s participation. A waiver for obtaining consent from both parents (that is, only one caregiver consent was required) was requested as granting permission for their child’s participation. In addition, the child was not recruited if s/he did not consent (i.e. assent) to take part in this study. Therefore, after getting the written consent form one caregiver (e.g. father, mother, or grandparents) granting permission to have their children participate in the study, the investigator then discussed scheduling an appropriate time for collecting the children’s data with the homeroom teachers. Those children whose caregivers refused to grant permission did not participate in the study; instead, they spent time in the recreation classroom where they participated in alternative activities as provided by their homeroom teacher.

The children completed all their questionnaires during class time. Only children whose caregivers have granted their permission to participate in the study stayed in the
classroom to complete the data collection. Although children were expected to sign the assent at home after receiving their caregivers’ permission, the investigator verified their assent before the data collection began. Hence, the investigator read the assent form to the children again to explain the study’s purpose and procedures, the confidentiality of their responses, and the voluntary nature of the study in order to respect their willingness to participate in the study. Time was provided for review and questions. Additionally, the children were assured that they had the choice to participate or not and had the right to withdraw any time. Furthermore, they were told that their participation or non-participation would not affect their relationships with their homeroom teachers, peers, grades, or student status in their school. Finally, after all the explanations and descriptions were completed, the data collection began. Children who did not want to participate in the study at that time were asked to go to the recreation room (as described above). Time was provided for clarification if the children had any questions about the questionnaires. Children were told that they did not need to complete any questions if they still found it difficult to answer after clarification was provided. The questionnaires did not contain the children’s names or student IDs; instead, code numbers were assigned. Studies among children and adolescents with similar data collection procedures in Taiwan had 80-94% response rates (Fu et al., 2008; Liao, 2010; Wu et al., 2003). Considering the attrition rate, feasibility, and accessibility of the study, other data collection methods such as telephone interviews would not apply.

Interested participants from sources other than public elementary schools would contact the investigator and then were screened by the investigator to determine their eligibility. The interviews were set up in mutually agreed places.
Protection of Human Subjects

The participants of this present study were fifth- and sixth-grade children and their primary caregivers, such as parents or grandparents. Since the main participants, the fifth and sixth graders, can read and write, a written assent form for the children was needed along with their parents’ consent forms. Hence, three forms were needed in the study: one written consent for the caregiver to take part in the study, one for the caregiver to grant permission to his/her child to participate, and the third was the written assent form for the child to consent to participate in the study. A request was sent to the IRB for a waiver of a signed consent from more than one caregiver to grant permission for their child’s participation. The investigator’s contact information was listed on the invitation letter, and discussion was welcomed if questions or issues of concern were raised in the data collection process and questionnaire.

With the homeroom teachers’ assistance, and without obtaining the children’s and caregivers’ contact information, the sealed package that included the invitation letter, consent forms, questionnaires for caregivers to complete, and children’s questionnaires was sent home within the students’ agenda books. However, each child and caregiver was assured their participation was voluntary while explaining and describing the purpose and procedures of the study. Refusal to participate would not affect the child’s rights, academic grades, or relationships with their school, homeroom teachers or classmates. In addition, the issue of confidentiality was addressed in that only the investigator had access to their completed questionnaires. During the process of data collection, time was provided for clarification if they had questions about the questionnaires. In addition,
children were told that they did not need to complete any questions if they find it confusing or difficult to answer.

Signatures and personal contact information, such as student ID, address, phone number, email address, and the research’s code numbers were placed only on the consent forms but not on the questionnaires. Only the code numbers were placed on the questionnaires. The caregiver-child dyad shared the same code number. Hence, a master identification list was created to link code numbers of questionnaires and student IDs after obtaining the caregivers’ completed and returned packages, which included the caregivers’ permission and the completed caregivers’ questionnaires. This master identification file will be kept locked in the investigator’s office for three years, and only the investigator has access. In addition, the investigator will give information about the general results of the study to the participants and homeroom teachers after the data analysis was completed.

This was a cross-sectional, descriptive and predictive correlational study; participants were asked to fill out the questionnaires only, and no invasive procedures were involved. Hence, participating in the study involved no physical risks. A similar data collection method has been used within the same population and was reported not that have caused psychological distress. However, the caregiver and homeroom teachers would be informed if it was found that the child was under a lot of academic stress and had extreme eating styles.

A 72-item questionnaire for the children took about 30 minutes of their time. As for each child’s caregiver, an 81-item questionnaire would take about 30 minutes of his or her time. Children who completed the questionnaires in class got a gift as
compensation for their time. Each class from which children participated got a book gift card. Their homeroom teachers would assist the class to purchase the books they liked with this gift card. Moreover, each caregiver who completed the questionnaire and returned it to the investigator got a gift card as compensation as well. Homeroom teachers also got a gift in appreciation for their assistance. Additionally, participants in the study got some potential benefits. The participants got an opportunity to reflect on their personal situations through answering the questionnaires, and they may have learned how to deal with things in alternative ways.

Data Management and Data Analysis

Data entry and analysis used SPSS statistical package program. A codebook and logs were developed before the initiation of data entry in order to guide the data coding and entry into the computer and to record the decisions regarding the flow of data management. The codebook contained the definitions and identifications of each variable in the study and included an abbreviated variable name, a descriptive label, and the range of numerical values of every variable entered into a computer file (Burns & Grove, 2009). The main purposes of developing a codebook and keeping the logs were to ensure the accuracy of the data entry and trace the data flow (Bowman, Wyman, & Peters, 2002).

Each questionnaire was assigned an identification/code number to ensure that the investigator could attribute data to the correct participant. Since the data collection was conducted by the investigator, completeness and clarity of each questionnaire was expected. While entering the data, strategies such as avoiding distractions and developing a rhythm were used to minimize errors (Burns & Grove, 2009). Double data entry was
used for cleaning data (Bourque & Clark, 1992). All the data were entered accurately by running frequencies for all variables to confirm the accuracy and the cleanness. Data were stored on the hard drive, a jump drive, and a CD-ROM, all with password protection to avoid the possibility of crashes in each storage method. After transferring and entering the data from the original instruments to a computer file, the entire computer file and original questionnaires were kept separately in two locked file boxes and were stored in the investigator’s office for 3 years. Only the investigator had access to open the files.

Data examination and preliminary analysis were used to describe the sample data before conducting further analyses that included identification of outliers, evaluation of missing data, and testing the assumptions (Hair et al., 2009). Checking statistics generated from SPSS Frequencies for all variables was one of the ways to identify unusual scores such as extreme outliers (influential cases) and missing values. Using regression also enabled the investigator to identify the presence of influential cases (primary assumption) if there were extreme values on Cook’s D (≥ 1.0). If outliers were detected, the analysis used two functions (with and without the outliers) and reported in those ways (Corty, 2007). Decisions regarding missing data were made such as using listwise and pairwise deletion methods (Allison, 2000; Bourque & Clark, 1992). In listwise deletion, cases with missing data were discarded, and only cases with complete data were included in analysis. In pairwise deletion, cases were discarded if one or both values were unavailable for correlational analysis.

Testing the assumptions was the final step in examining the data before conducting further analysis. According to Darlington (1990), there are primary and secondary assumptions for the statistical test of bivariate (and multiple) regression.
Primary assumptions (most important) are the assumptions that mostly affect descriptive statistics and include (1) variance (variables are varied), (2) no influential cases, and (3) linearity (Darlington, 1990). Secondary assumptions (least important) are the assumptions that affect mostly inferential statistics and include (1) equal variance of residuals and (2) normality (Darlington, 1990).

Several methods were used to examine the primary and secondary assumptions such as statistics generated from SPSS Frequencies, Regression, Graphs, and Explore. For example, using SPSS Frequencies and Explore the investigator was able to ensure that all variables did vary, one of the primary assumptions. Lack of variance decreases correlations with other variables, and so the researcher made sure the values of a single variable did not fall predominantly at one or two consecutive scores. For categorical data, the cases were separated reasonably well across the various unordered categories. For a dichotomous variable, deleting the variables where the split was 90/10 or less (cases in the smaller group, 10% or less) would reduce a disproportionate effect on the size of the correlation with other variables (Tabachnick & Fidell, 2012). Statistics generated from SPSS Frequencies also provided information on the normality of the distribution of variables such as skewness and kurtosis. Therefore, the assumption of normality would be met if there was no skewness (< 3) or kurtosis (< 8-20) (Corty, 2007). In general, variables have variance if they meet normality. Regression was used to detect the presence of influential cases (primary assumption) as previously described. A scatterplot was used to test assumptions of linearity (Hair et al., 2009). If violation of linearity was detected, transformation of variables was considered. However, transformation might change the interpretation of variables (Hair et al., 2009) so the analysis used two
approaches (with and without transformation of variables) and reported both sets of findings.

Using Frequencies, as previously described, the assumption of normality was met if there was no skewness or kurtosis of variables (Corty, 2007). According to the Central Limit Theorem, larger samples reduce the importance of secondary assumptions (equal variance of residuals and normality) if the sample sizes reach 30 to 40 or above (Allison, 1998). Therefore, the secondary assumptions were met because there were at least 128 cases for analysis.

Table 3.4.

Research Questions and Statistical Methods

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Statistical Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Are intrinsic (children’s age, gender, BMI, satiety responsiveness, and hunger/satiety cues) and extrinsic (caregivers’ resourcefulness, dispositional optimism/pessimism, and eating styles – emotional, external, and restrained) contextual factors associated with process regulators (academic stress and dispositional optimism/pessimism)?</td>
<td>independent-samples t tests Pearson product-moment correlation coefficient</td>
</tr>
<tr>
<td>2 Are intrinsic (children’s age, gender, BMI, satiety responsiveness, and hunger/satiety cues) and extrinsic (caregivers’ resourcefulness, dispositional optimism/pessimism, and eating styles – emotional, external, and restrained) contextual factors associated with self-control behavior (children’s resourcefulness skills)?</td>
<td>independent-samples t tests Pearson product-moment correlation coefficient</td>
</tr>
<tr>
<td>3 Are intrinsic (children’s age, gender, BMI, satiety responsiveness, and hunger/satiety cues) and extrinsic (caregivers’ resourcefulness, dispositional optimism/pessimism, and eating styles – emotional, external, and restrained) contextual factors associated with target behavior (children’s eating styles – emotional, external, and restrained)?</td>
<td>independent-samples t tests Pearson product-moment correlation coefficient</td>
</tr>
<tr>
<td>4 What are the strengths and directions of the relationships between process regulators (academic stress and dispositional optimism/pessimism) and the self-control behavior (children’s resourcefulness skills)?</td>
<td>Pearson product-moment correlation coefficient</td>
</tr>
</tbody>
</table>
Table 3.4.

*Research Questions and Statistical Methods (cont’d)*

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Statistical Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. What are the strengths and directions of the relationships between process regulators (academic stress and dispositional optimism/pessimism) and the target behavior (children’s eating styles – emotional, external, and restrained)?</td>
<td>Pearson product-moment correlation coefficient</td>
</tr>
<tr>
<td>6. What is the strength and direction of the relationship between self-control behavior (children’s resourcefulness skills) and the target behavior (children’s eating styles – emotional, external, and restrained Eating)?</td>
<td>Pearson product-moment correlation coefficient</td>
</tr>
<tr>
<td>7. While controlling for covariates, how do process regulators (academic stress and dispositional optimism/pessimism) mediate intrinsic (children’s age, gender, BMI, satiety responsiveness, and hunger/satiety cues) and extrinsic (caregivers’ resourcefulness, dispositional optimism/pessimism, and eating styles – emotional, external, and restrained) contextual factors on self-control behavior (children’s resourcefulness skills)?</td>
<td>Multiple regression (hierarchical multiple regression)</td>
</tr>
<tr>
<td>8. How does self-control behavior (children’s resourcefulness skills) mediate process regulators (academic stress and dispositional optimism/pessimism) on target behavior (children’s eating styles – emotional, external, and restrained)?</td>
<td>Multiple regression (hierarchical multiple regression)</td>
</tr>
<tr>
<td>9. While controlling for covariates, how do process regulators (academic stress and dispositional optimism/pessimism) and self-control behavior (children’s resourcefulness skills) mediate intrinsic (children’s age, gender, BMI, satiety responsiveness, and hunger/satiety cues) and extrinsic (caregivers’ resourcefulness, dispositional optimism/pessimism, and eating styles – emotional, external, and restrained) contextual factors on target behavior (children’s eating styles – emotional, external, and restrained)?</td>
<td>Multiple regression (hierarchical multiple regression)</td>
</tr>
</tbody>
</table>

Each research question and statistical method used is listed in the Table 3.4. The independent-samples t tests were used to assess the differences between dichotomous variables (independent variables) and ordinal/interval variables (dependent variables).
such as the differences to be examined in RQ #1 through RQ #3 (Figure 1.2). For example, the independent-sample t tests were performed to examine differences by children’s gender (dichotomous variable) (independent variable) on academic stress or dispositional optimism/pessimism (dependent variables) (RQ #1). The Pearson product-moment correlation coefficient was used to detect the interrelationships among the major study variables such as those to be examined in RQ #1 through RQ #6 (Figure 1.2). For instance, Pearson product-moment correlation coefficients were applied to detect relationships between the process regulators (academic stress and dispositional optimism/pessimism) and self-control behaviors (children’s resourcefulness skills).

![Figure 3.1. The mediation diagram.](image)

Hierarchical multiple regression is appropriate for assessing the possible mediating effects of a set of variables on the relationship between another set of independent variables (IVs) and the dependent variable (DV) (Hair et al., 2009; Tabachnick & Fidell, 2012). Mediating variables (MVs) improve the understanding of a relationship between IVs and DV because they are part of the causal sequence of IVs to DV through MVs. Furthermore, mediators provide an explanation of how or why such effects occur; in other words, mediators will be able to transmit the effects of an independent variable on a dependent as well as clarify how an independent variable indirectly affects the dependent variable (Baron & Kenny, 1986; MacKinnon, Fairchild, & Fritz, 2007). As presented in Figure 1.3, a series of hierarchical multiple regressions
was used to answer RQ #7 through RQ #9. For example, in hierarchical multiple regression, the possible mediating effect of the self-control behavior (children’s resourcefulness skills) on the relationship between the process regulators (academic stress and dispositional optimism/pessimism) and target behavior (children’s eating styles – emotional, external, and restrained) was examined (RQ #8).

As suggested by scholars (Baron & Kenny, 1986; Judd & Kenny, 1981), the basic interrelationship involved in mediation is presented in Figure 3.1. First, there should be a significant relationship between the initial independent variable (IV) and the mediator (Regression Equation 1) (Figure 3.1, path a). Second, there must be a significant relationship between the initial IV and the dependent variable (DV) (Regression Equation 2) (Figure 3.1, path c). Third, the mediator must have a significant relationship with the DV (Regression Equation 3) (Figure 3.1, path b). Last, when both IV and the mediator are controlled (Regression Equation 4), a previously significant relationship between the IV and DV (path c’) is reduced or no longer exists. That is, if the mediating effect exists, the standardized coefficients (Beta) relating the IVs to the DV (path c) must be larger (in absolute value) than the standardized coefficients (Beta) relating the IVs to the DV in the regression model with both the IVs and the mediator predicting the DV (path c’). Hence, it can be determined by comparing these standardized coefficients of Equation 2 and Equation 4 that the mediator has a partially or completely mediating effect on the relationship between the independent and dependent variables. Based on Baron and Kenny’s (1986) mediation analysis, the relationships between IVs and DV (Regression Equation 2; Figure 3.1, path c) must be significant in order to have effects be mediated; however, scholars have pointed out that there is no need to have a significant effect of
IVs on DV first (Kenny, 2012; MacKinnon & Fairchild, 2009; MacKinnon et al., 2007; Zhao, Lynch, & Chen, 2010), which states that mediation can exist even in the absence of a significant relation between IVs and DV.

In hierarchical multiple regression, the independent/predictor variables were entered into the analysis in a sequence of blocks or groups that may contain one or more variables in hierarchical regression. For example, the following steps were used in hierarchical multiple regression to examine the possible mediating effect of the self-control behavior (children’s resourcefulness skills) on the relationship between the process regulators (academic stress and dispositional optimism/pessimism) and the target behavior (children’s eating styles – emotional, external, and restrained) in response to RQ #8. First, the process regulators (academic stress and dispositional optimism/pessimism) were added into the first block. Second, the self-control behavior (children’s resourcefulness skills) was entered in the second block.

An understanding of the relationships among resourcefulness, academic stress, dispositional optimism/pessimism, and eating styles among fifth and sixth graders was needed, and this understanding is essential in laying the foundations for future interventional approaches in order to maximize health outcomes for children and their families, to decrease the burden on society and the health-delivery system, and to contribute to the development of resourcefulness knowledge in children among nursing professionals.
CHAPTER 4: RESULTS

Introduction

The purpose of this study was to explore the interrelationships among resourcefulness, academic stress, dispositional optimism, eating styles, and contextual factors of fifth and sixth graders in Taiwan. In addition, the mediating effects of process regulators on the relationships between contextual factors and self-control behavior, of self-control behavior on the relationships between process regulators and target behavior, and of process regulators and self-control behavior on the relationships between contextual factors and target behavior were investigated. This chapter summarizes the results of the study.

Response Rate

A community-based convenience sample was recruited from two public primary schools and community centers in Taiwan. Of the 505 invitations for participation in the study, 368 (72.87%) caregiver-child dyads returned completed consent forms and questionnaires. Of the 368 caregiver-child dyads, 74 dyads were recruited from the community centers and 294 dyads were recruited from the two schools. Response rates differed between schools with 44.30% in the more socioeconomically deprived school and 81.49% in the other school. Table 4.1 displays the description of the response rate.

Table 4.1.

<table>
<thead>
<tr>
<th></th>
<th>School (n=294)</th>
<th>Community (n=74)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A (n=228)</td>
<td>B (n=66)</td>
</tr>
<tr>
<td>Response rate</td>
<td>81.49%</td>
<td>44.30%</td>
</tr>
<tr>
<td>Education(^a)  [M(SD)]</td>
<td>13.16 (3.01)</td>
<td>11.85 (2.75)</td>
</tr>
<tr>
<td>Family income (monthly, NTD)(^b)(Mean)</td>
<td>59,873.76</td>
<td>51,201.64</td>
</tr>
</tbody>
</table>

Note. \(a\)=Year completed (caregiver). \(b\)=Currency rate: 30 NTD = 1 USD (March 2012).
Preliminary Data Analysis

Preliminary data analyses were conducted in multiple steps in order to check for errors, miscoding problems, and missing data, to identify outliers, and to ensure that all the assumptions underlying the statistical analyses were met. First, frequencies and descriptive statistics -- generated from SPSS for all variables -- were examined to check for errors, miscoding problems, and missing data. Second, regression analyses were used to detect influential cases. Lastly, the assumptions for Pearson’s product-moment correlation coefficient and multiple regression were tested.

Data Screening

According to the frequencies and descriptive analyses, the variables had adequate variance and no variables had a single response greater than 90% after errors and miscodes were corrected. In addition, no extreme outliers were found. Missing data were found in less than 10% of cases on all variables. Tabachnick and Fidell (2012) stated that up to 10% of missing data on a specific variable are acceptable. Therefore, decisions regarding missing data in the present study were made by using listwise or pairwise deletion: discarding cases with missing data and only cases with complete data were included in analysis by using listwise deletion, and discarding cases if one or both values were unavailable for correlational analysis by using pairwise deletion. In this present study, the pairwise deletion was used in correlational analyses, and the listwise deletion was applied in other statistical analyses, particularly regression analyses.

Description of Participants

Child participants. Child participants’ ages ranged from 10 to 13 years, with an average age of 11.61 years (SD = .56). Of the 368 child participants, 186 (50.54%) were
fifth graders and 182 (49.46%) were sixth graders; in addition, 168 (45.65%) were boys and 200 (54.35%) were girls. The children’s school performance was evaluated by their last semester’s academic grades. The range was 0.0 to 4.0 and it was calculated by the average of all courses completed. The average school performance for this group of child participants was 3.46 (SD = .69). Thirty-three (8.97%) reported having chronic conditions such as asthma (39.39%) and allergic rhinitis (27.27%); nevertheless, only 17 (4.62%) reported using medication regularly. The demographic characteristics of the child participants are presented in Table 4.2.

Table 4.2.

Demographic Characteristics of the Child Participants (N = 368)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>n (%)</th>
<th>M (SD)</th>
<th>Range</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (year)</td>
<td></td>
<td>11.61 (.56)</td>
<td>10.58-13.06</td>
<td>-.06</td>
<td>-.90</td>
</tr>
<tr>
<td>Grade</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fifth</td>
<td>186 (50.54)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sixth</td>
<td>182 (49.46)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>168 (45.65)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Girls</td>
<td>200 (54.35)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School performance</td>
<td></td>
<td>3.46 (.69)</td>
<td>0-4</td>
<td>-1.78</td>
<td>3.78</td>
</tr>
<tr>
<td>Chronic condition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No (0)</td>
<td>335 (91.03)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes (1)</td>
<td>33 (8.97)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asthma</td>
<td>13 (39.39)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allergic rhinitis</td>
<td>9 (27.27)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>11 (33.33)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No (0)</td>
<td>351 (95.38)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes (1)</td>
<td>17 (4.62)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height (cm)</td>
<td></td>
<td>148.03 (.08)</td>
<td>130-172</td>
<td>.23</td>
<td>-.01</td>
</tr>
<tr>
<td>Boys</td>
<td>148.49 (.08)</td>
<td></td>
<td>130-172</td>
<td>.58</td>
<td>.17</td>
</tr>
<tr>
<td>Girls</td>
<td>147.65 (.07)</td>
<td></td>
<td>130-167</td>
<td>-.19</td>
<td>-.47</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td></td>
<td>42.34 (10.69)</td>
<td>24.0-91.5</td>
<td>.98</td>
<td>1.33</td>
</tr>
<tr>
<td>Boys</td>
<td>44.28 (11.94)</td>
<td></td>
<td>24.0-91.5</td>
<td>.96</td>
<td>1.00</td>
</tr>
<tr>
<td>Girls</td>
<td>40.71 (9.23)</td>
<td></td>
<td>25.0-68.7</td>
<td>.73</td>
<td>.59</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td></td>
<td>19.13 (3.76)</td>
<td>10.04-34.23</td>
<td>.98</td>
<td>.95</td>
</tr>
<tr>
<td>Boys</td>
<td>19.84 (4.04)</td>
<td></td>
<td>12.76-34.23</td>
<td>.89</td>
<td>.54</td>
</tr>
<tr>
<td>Girls</td>
<td>18.55 (3.43)</td>
<td></td>
<td>10.04-30.22</td>
<td>1.00</td>
<td>1.23</td>
</tr>
<tr>
<td>BMIz²</td>
<td></td>
<td>.37 (1.35)</td>
<td>-5.37-3.88</td>
<td>-.19</td>
<td>.21</td>
</tr>
<tr>
<td>Boys</td>
<td>.08 (1.30)</td>
<td></td>
<td>-6.73-2.91</td>
<td>-.41</td>
<td>1.33</td>
</tr>
</tbody>
</table>

Note. a = BMI z-score converted based upon the WHO reference 2007 (de Onis et al., 2007). b = BMI z-score converted based upon the 1997 Taiwanese reference (Huang, 2002).
Table 4.3.

Weight Status of Child Participants (N = 368)

<table>
<thead>
<tr>
<th></th>
<th>All (n=362)</th>
<th>Boys (n=168)</th>
<th>Girls (n=200)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td><strong>Underweight</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(percentile &lt; 5&lt;sup&gt;th&lt;/sup&gt;)</td>
<td>64 (17.68)</td>
<td>26 (40.63)</td>
<td>38 (59.38)</td>
</tr>
<tr>
<td><strong>Normal Weight</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(5&lt;sup&gt;th&lt;/sup&gt; ≤ percentile &lt; 85&lt;sup&gt;th&lt;/sup&gt;)</td>
<td>203 (56.08)</td>
<td>80 (39.41)</td>
<td>123 (60.59)</td>
</tr>
<tr>
<td><strong>Overweight</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(85&lt;sup&gt;th&lt;/sup&gt; ≤ percentile &lt; 95&lt;sup&gt;th&lt;/sup&gt;)</td>
<td>45 (12.43)</td>
<td>30 (66.67)</td>
<td>15 (33.33)</td>
</tr>
<tr>
<td><strong>Obese</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(percentile ≥ 95&lt;sup&gt;th&lt;/sup&gt;)</td>
<td>50 (13.81)</td>
<td>27 (54.00)</td>
<td>23 (46.00)</td>
</tr>
<tr>
<td><strong>Overweight or Obese</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(percentile ≥ 85&lt;sup&gt;th&lt;/sup&gt;)</td>
<td>95 (26.24)</td>
<td>57 (60.00)</td>
<td>38 (40.00)</td>
</tr>
</tbody>
</table>

Note. a = BMI-for-age percentile (Food and Drug Administration, Department of Health, Executive Yuan, Republic of China [Taiwan], 2010).
As displayed in Table 4.2, the average heights for the child participants were 148.03 (SD = .08) centimeters (cm) (about 58.28 inches), and the mean weights were 42.34 (SD = 10.69) kilograms (kg) (about 93.26 lb). Of this group of fifth and sixth graders, on average boys were taller and weighed more than girls. Additionally, the children’s mean BMIs were 19.13 (SD = 3.76) and boys had higher BMIs than girls. BMI was converted to BMI z-scores based upon the WHO reference (de Onis et al., 2007) and 1997 Taiwanese reference (Huang, 2002). A z-score of 0 is equivalent to the median or 50 percentile values, a z-score of -1.64 is equivalent to the 5th percentile, and a z-score of +1.04 is equivalent to the 85th percentile (Huang, 2002). As seen in Table 4.2, the average BMI z-score was .37 (SD = 1.35, range = -5.37 to 3.88).

Children’s weight status is depicted in Table 4.3. On the basis of the childhood overweight criteria by BMI levels (CDC, 2011; Chen et al., 2003; Food and Drug Administration, Department of Health, Executive Yuan, Republic of China [Taiwan], 2010), 26.24% of children (n=95) were overweight or obese (BMI at or above the 85th BMI-for-age percentile), of which 45 were overweight (66.67% of boys, 33.33% of girls) (BMI at or above the 85th BMI-for-age percentile and lower than the 95th percentile) and 50 were obese (54.00% of boys, 46.00% of girls) (BMI at or above the 95th percentile). The highest prevalence of childhood overweight or obesity was found at age 11 for both boys (n=33) and girls (n=18). In general, boys have a higher prevalence of being overweight or obese than girls (boys: 60.00%; girls: 40.00%). Girls have a higher prevalence of being underweight than boys (boys: 40.63%; girls: 59.38%).

Children’s eating styles were measured by Children’s Dutch Eating Behavior Questionnaire (DEBQ-C) (Van Strien & Oosterveld, 2008). According to the creator of
the DEBQ (Van Strien, 2005), each eating style has seven categories based on the scoring system. As shown in Table 4.4, a very limited percentage of children had a high to very high tendency of the emotional, external, or restrained eating styles. Most of them had a low to average tendency toward these eating styles. About 80% of children in the study had a very low to low tendency toward emotional eating, whereas only less than one percent had a high to very high tendency. Over 80% of children had a fairly average (below to above average ratings) tendency toward external eating, whereas about 6% of them had a high to very high tendency toward external eating. Less than 5% of children had a high to very high tendency toward restrained eating, most of them were in the very low to above average categories.

Table 4.4.

Classification of Eating Styles (Child) (N = 368)

<table>
<thead>
<tr>
<th>Classification</th>
<th>Emotional</th>
<th>External</th>
<th>Restrained</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>Very Low</td>
<td>197 (54.7)</td>
<td>11 (3.0)</td>
<td>77 (21.3)</td>
</tr>
<tr>
<td>Low</td>
<td>94 (26.1)</td>
<td>36 (9.9)</td>
<td>100 (27.7)</td>
</tr>
<tr>
<td>Below Average</td>
<td>36 (9.9)</td>
<td>86 (23.6)</td>
<td>55 (15.2)</td>
</tr>
<tr>
<td>Average</td>
<td>42 (6.3)</td>
<td>152 (41.9)</td>
<td>92 (25.4)</td>
</tr>
<tr>
<td>Above Average</td>
<td>8 (2.2)</td>
<td>57 (15.7)</td>
<td>21 (5.8)</td>
</tr>
<tr>
<td>High</td>
<td>1 (.3)</td>
<td>16 (4.5)</td>
<td>14 (3.9)</td>
</tr>
<tr>
<td>Very High</td>
<td>1 (.3)</td>
<td>5 (1.4)</td>
<td>3 (.8)</td>
</tr>
</tbody>
</table>

Caregiver participants. Caregivers’ descriptive characteristics are showed in Table 4.5. The age range of caregivers was 20 to 76 years with an average of 40.87 (SD = 5.42) years. Of the 368 caregivers, 290 (78.80%) were mothers, 71 (19.29%) were fathers, and only 3 (.81%) caregivers were the grandparents. The average years of completed education of caregivers were 13.44 (SD = 3.22) years; this means beyond having completed high school (12 years). Thirty-eight percent of the sample completed high
school, and 21% completed a four-year undergraduate program. Two caregivers (.54%) reported that they did not have the opportunity to complete elementary school. Mean monthly family income was 67,022.29 (SD = 42,668.96) New Taiwan dollars (NTD), which is approximately 2,234.08 (SD = 1,422.30) US dollars (USD) per month as of March 2012 (1 USD = 30 NTD). The sample’s average monthly income per household (NTD 67,022.29) was lower than the national average monthly income per household in 2010, which was NTD 93,646.75 (Directorate-General of Budget, Accounting and Statistics, Executive Yuan, Republic of China [Taiwan], 2011).

Table 4.5.

Descriptive Characteristics of the Caregiver Participants

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>n (%)</th>
<th>M (SD)</th>
<th>Range</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (year)</td>
<td>40.87 (5.42)</td>
<td>20-76</td>
<td>.91</td>
<td>6.52</td>
<td></td>
</tr>
<tr>
<td>Relationship to the child</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mother</td>
<td>290 (78.80)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Father</td>
<td>71 (19.29)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grandmother</td>
<td>2 (.54)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grandfather</td>
<td>1 (.27)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>4 (1.09)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>296 (80.43)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>72 (19.57)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height (cm)</td>
<td>161.08 (.07)</td>
<td>140-187</td>
<td>.52</td>
<td>.43</td>
<td></td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>59.25 (10.35)</td>
<td>42-97</td>
<td>.83</td>
<td>.58</td>
<td></td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>22.74 (3.17)</td>
<td>17.16-36.51</td>
<td>.80</td>
<td>.94</td>
<td></td>
</tr>
<tr>
<td>Weight status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Underweight (BMI&lt;18.5)</td>
<td>26 (7.07)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal weight (18.5≤BMI≤23.9)</td>
<td>230 (62.50)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overweight (24.0≤BMI≤26.9)</td>
<td>67 (18.21)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obese (BMI≥27.0)</td>
<td>42 (11.41)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missing data</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education (completed years)</td>
<td>13.44 (3.22)</td>
<td>0-23</td>
<td>-.10</td>
<td>.93</td>
<td></td>
</tr>
<tr>
<td>Family income</td>
<td>67,022.29 (42,668.96)</td>
<td>0-300000</td>
<td>2.07</td>
<td>7.65</td>
<td></td>
</tr>
</tbody>
</table>

Note. a=Currency exchange rate, 30 NTD = 1 USD (March 2012).

As displayed in Table 4.5, the caregivers’ average BMI score was 22.74 (SD = 3.17). According to the adulthood overweight criteria (Food and Drug Administration,
Department of Health, Executive Yuan, Republic of China [Taiwan], 2010), of the 368 caregiver participants, 18.21% were overweight and 11.41% were obese.

Caregivers’ eating styles were evaluated by the DEBQ (Van Strien et al., 1986). Following the classification system inherent in the DEBQ (Van Strien, 2005), the majority of caregivers had an average tendency toward the three eating styles (emotional, external, and restrained) (See Table 4.6). The percentages of a high tendency toward emotional, external, and restrained eating styles were 0.6, 2.2, and 4.7, respectively. A very low percentage (0.3) of caregivers had a very high tendency toward external eating. None of caregivers had a very high tendency toward emotional or restrained eating styles.

Table 4.6.

Classification of Eating Styles (Caregiver) (N = 368)

<table>
<thead>
<tr>
<th>Classification</th>
<th>Emotional</th>
<th>External</th>
<th>Restrained</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>Very Low</td>
<td>37 (10.5)</td>
<td>6 (1.6)</td>
<td>11 (3.1)</td>
</tr>
<tr>
<td>Low</td>
<td>85 (23.9)</td>
<td>13 (3.6)</td>
<td>37 (10.3)</td>
</tr>
<tr>
<td>Below Average</td>
<td>154 (43.3)</td>
<td>94 (25.6)</td>
<td>100 (27.9)</td>
</tr>
<tr>
<td>Average</td>
<td>70 (19.7)</td>
<td>176 (48.2)</td>
<td>136 (37.9)</td>
</tr>
<tr>
<td>Above Average</td>
<td>8 (2.4)</td>
<td>68 (18.6)</td>
<td>58 (16.2)</td>
</tr>
<tr>
<td>High</td>
<td>2 (.6)</td>
<td>8 (2.2)</td>
<td>17 (4.7)</td>
</tr>
<tr>
<td>Very High</td>
<td>0 (0)</td>
<td>1 (.3)</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>
Table 4.7.

*Description of the Empirical Indicators and Reliability Coefficients (Cronbach’s Alphas) (N = 368)*

<table>
<thead>
<tr>
<th>Scale</th>
<th>Range</th>
<th>M (SD)</th>
<th>Skewness</th>
<th>Kurtosis</th>
<th>No. of Items</th>
<th>Alpha</th>
<th>No. of Items</th>
<th>Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>DV: DEBQ-C (Total)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotional Eating</td>
<td>360</td>
<td>7-21</td>
<td>7-21</td>
<td>8.48 (2.46)</td>
<td>2.18</td>
<td>4.75</td>
<td>7</td>
<td>.86</td>
</tr>
<tr>
<td>External Eating</td>
<td>363</td>
<td>6-18</td>
<td>6-18</td>
<td>11.37 (2.60)</td>
<td>.18</td>
<td>-.23</td>
<td>6</td>
<td>.73</td>
</tr>
<tr>
<td>Restrained Eating</td>
<td>362</td>
<td>6-18</td>
<td>6-18</td>
<td>9.41 (3.06)</td>
<td>.71</td>
<td>-.37</td>
<td>6</td>
<td>.80</td>
</tr>
<tr>
<td>IV - Child</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satiety Responsiveness</td>
<td>364</td>
<td>5-25</td>
<td>5-25</td>
<td>11.65 (3.55)</td>
<td>.65</td>
<td>.72</td>
<td>5</td>
<td>.73</td>
</tr>
<tr>
<td>Satiety Responsiveness by Caregiver</td>
<td>362</td>
<td>5-25</td>
<td>5-25</td>
<td>12.47 (3.48)</td>
<td>.49</td>
<td>.60</td>
<td>5</td>
<td>.78</td>
</tr>
<tr>
<td>Hunger/Satiety Cues</td>
<td>356</td>
<td>6-30</td>
<td>6-30</td>
<td>22.71 (4.44)</td>
<td>-.72</td>
<td>1.20</td>
<td>6</td>
<td>.78</td>
</tr>
<tr>
<td>Academic Stress Scale</td>
<td>360</td>
<td>8-32</td>
<td>8-32</td>
<td>16.61 (5.50)</td>
<td>.48</td>
<td>-.52</td>
<td>8</td>
<td>.83</td>
</tr>
<tr>
<td>Optimism Scale</td>
<td>353</td>
<td>2-60</td>
<td>0-60</td>
<td>36.42 (12.72)</td>
<td>.01</td>
<td>-.59</td>
<td>12</td>
<td>.92</td>
</tr>
<tr>
<td>Pessimism</td>
<td>364</td>
<td>0-8</td>
<td>0-8</td>
<td>3.78 (2.10)</td>
<td>.07</td>
<td>-.54</td>
<td>2</td>
<td>.72</td>
</tr>
<tr>
<td>Children’s Resourcefulness Scale</td>
<td>351</td>
<td>0-45</td>
<td>0-45</td>
<td>23.63 (7.39)</td>
<td>.14</td>
<td>.04</td>
<td>9</td>
<td>.65</td>
</tr>
<tr>
<td>IV - Caregiver</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resourcefulness Scale</td>
<td>346</td>
<td>6-131</td>
<td>0-140</td>
<td>86.18 (16.38)</td>
<td>-62</td>
<td>3.12</td>
<td>28</td>
<td>.91</td>
</tr>
<tr>
<td>Pessimism</td>
<td>362</td>
<td>0-8</td>
<td>0-8</td>
<td>3.97 (1.80)</td>
<td>-.05</td>
<td>-.39</td>
<td>2</td>
<td>.76</td>
</tr>
<tr>
<td>DEBQ: Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotional Eating</td>
<td>356</td>
<td>13-61</td>
<td>13-65</td>
<td>27.30 (8.69)</td>
<td>.49</td>
<td>.41</td>
<td>13</td>
<td>.94</td>
</tr>
<tr>
<td>External Eating</td>
<td>366</td>
<td>7-34</td>
<td>7-35</td>
<td>20.27 (4.46)</td>
<td>-.06</td>
<td>.66</td>
<td>7</td>
<td>.85</td>
</tr>
<tr>
<td>Restrained Eating</td>
<td>359</td>
<td>9-43</td>
<td>9-45</td>
<td>24.79 (7.15)</td>
<td>-.06</td>
<td>-.27</td>
<td>9</td>
<td>.90</td>
</tr>
</tbody>
</table>

Note. DV = dependent variable; IV = independent variable.
Table 4.8.

Factor Loadings of the CLOT-R

<table>
<thead>
<tr>
<th>Items</th>
<th>Child (n=364)</th>
<th>Caregiver (n=361)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>Factor Loadings</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Eigenvalues</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Variance)</td>
</tr>
<tr>
<td>Factor 1: Pessimism</td>
<td></td>
<td>2.04 (33.91)</td>
</tr>
<tr>
<td>#4. I hardly ever expect things to go my way.</td>
<td>.787</td>
<td></td>
</tr>
<tr>
<td>#5. I rarely count on good things happening to me.</td>
<td>.680</td>
<td></td>
</tr>
<tr>
<td>#2. Looking into the future, I do not see any positive scenarios.</td>
<td>.282</td>
<td></td>
</tr>
<tr>
<td>Factor 2: Optimism</td>
<td>1.23 (20.56)</td>
<td></td>
</tr>
<tr>
<td>#3. I am always optimistic about my future.</td>
<td>.717</td>
<td></td>
</tr>
<tr>
<td>#1. In uncertain times, I always expect the best.</td>
<td>.517</td>
<td></td>
</tr>
<tr>
<td>#6. Overall, I expect more good things to happen to me than bad.</td>
<td>.346</td>
<td></td>
</tr>
<tr>
<td>Total variability</td>
<td>54.47</td>
<td></td>
</tr>
<tr>
<td>Factor 1 with Factor 2 correlation</td>
<td>.33</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.9.

Reliability Coefficients (Cronbach’s Alphas) of CLOT-R (N = 368)

<table>
<thead>
<tr>
<th>Cronbach’s Alpha</th>
<th>CLOT-R</th>
<th>Total Items</th>
<th>Factor 1 (Pessimism)</th>
<th>Factor 2 (Optimism)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Factor 1 (Pessimism)</td>
<td>Factor 2 (Optimism)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 (#2, 4, 5)</td>
<td>2 (#4, 5)</td>
<td>3 (#1, 3, 6)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 (#4, 5)</td>
<td>3 (#1, 3, 6)</td>
<td>2 (1, 3)</td>
</tr>
<tr>
<td>Child (n=364)</td>
<td>.59</td>
<td>.59</td>
<td>.72</td>
<td>.52</td>
</tr>
<tr>
<td>Caregiver (n=361)</td>
<td>.69</td>
<td>.70</td>
<td>.76</td>
<td>.66</td>
</tr>
</tbody>
</table>
Psychometric Properties of the Study Measures

Before using the scales for subsequent analyses, exploratory factor analysis (EFA) and reliability assessment of the measures used in the current study were conducted in order to eliminate redundant items and generate a more parsimonious solution with stronger levels of internal consistency. For example, one item was removed from each of the following measures: children’s restrained eating, children’s resourcefulness, and caregivers’ restrained eating. Three items were removed (one item at a time) from caregivers’ external eating scales. The items used in each measure, and the individual internal consistencies (Cronbach’s alpha) are summarized in Table 4.7.

The 6-item CLOT-R, used to measure both the children’s and caregivers’ dispositional optimism in this study, includes three positively- (optimistic) and three negatively-phrased (pessimistic) items (Lai, 2003). When scoring these two sets of items separately, higher scores indicate a greater degree of optimism or pessimism. As presented in Table 4.8, results of principal axis factoring (using direct oblimin rotation) show the presence of two factors with eigenvalues greater than one and accounting for 54.47% (child) and 62.17% (caregiver) of the variance. To find the most parsimonious measurement model with stronger internal consistency (i.e. Cronbach’s alpha) two of the pessimistic subscale items (numbers 4 & 5) comprised the final scale after the other problematic items are removed (See Table 4.9). Therefore, the pessimism subscale of the CLOT-R was used in subsequent analyses for measuring both the children’s and caregivers’ dispositional pessimism.

In conclusion, the reliability coefficients for the measures (ranging from .65 to .94; See Table 4.7) used in the present study were acceptable or marginally acceptable with
rounding to one decimal place approximating the .7 criterion, as suggested by multiple researchers (DeVellis, 2003; Nunnally & Bernstein, 1994).

**Testing Assumptions for Statistical Methods**

Pearson’s product-moment correlation coefficient and multiple regression were the major statistical methods used in this study. Assumptions for these statistical methods were needed to be examined prior to subsequent statistical analyses to assure no violation existed, as a violation would influence the statistical significance. A series of tests for potential violations of each of the underlying assumptions were examined across all independent variables or predictors with each dependent variable. The primary assumptions include variability, influence, linearity, and absence of multicollinearity. The secondary assumptions require homoscedasticity (constant error variance) and normality of residuals.

**Variability and normality.** Assumptions of the variance of variables and normality were met. Through examination of frequencies, no variable had a single response over 90%. In addition, as shown in Table 4.2, 4.5, and 4.7, the distribution was not too skewed and most scores fell within a few consecutive values. In fact, all variables’ absolute values of skewness and kurtosis were in an acceptable range (skewness < 3; kurtosis < 8-20) (Kline, 2005), which suggests normal distribution of the variables. Moreover, according to the Central Limit Theorem, the influence of non-normality is minimal if the sample size is greater than 30 (Tabachnick & Fidell, 2012) or greater than 50 (Corty, 2007). Since all variables’ scores of skewness and kurtosis were in acceptable ranges and the sample in this current study was 368, the assumption of normality can be met. In conclusion, the variables had adequate variability and were normally distributed.
**Influence (absence of influential cases).** Testing for this assumption was done through regression analyses of residuals and related diagnostics (Cook’s Distance) among all predictors and dependent variables. No extreme values on Cook’s Distance were found, and all the values of Cook’s Distance (ranged .039 to .288) across a series of regressions were less than one (Tabachnick & Fidell, 2012). Hence, the assumption of absence of influential cases was met.

**Linearity.** The linearity requirement is met when the association of independent and dependent variables is linear; this happens when variables are graphed and follow a straight line (Tabachnick & Fidell, 2012). Linearity was assessed by generating a series of scatter plots that show the correlations between any of two independent and dependent variables, and partial plots that are in regression across all predictors and each dependent variable. Examinations were done by adding the lines of best fit on the plots, which then make it possible to the relative size of R square for the various fit lines (linear, quadratic, and cubic) and compare these R squares between the fit lines. A nonlinear relationship would exist if the differences between various fit lines (linear and quadratic as well as quadratic and cubic) go over 2% of the additional explained variance.

In this study, monotonic non-linear relationships existed among some of the independent (predictive) and dependent variables. Therefore, single-term power transformations based on the Bulging Rule (Hair et al., 2009) were applied to overcome any violations of non-linearity. For example, the independent variable (the total scores of satiety responsiveness, squared, as rated by caregivers) and the dependent variable (children’s external eating) as well as the predictor (squared of satiety responsiveness as rated by the children) and the dependent variable (children’s academic stress) were
applied to counter the violation of non-linearity. Since there were no differences in statistical results between the original and transformed variables, the original variables were used to maintain a more parsimonious model. However, the statistical result turned out to be significant between the square root of caregivers’ external eating (independent variable) and children’s resourcefulness (dependent variable); therefore, the square root of caregivers’ external eating (IV) was the only one transformed variable that was used to discuss the relationship with children’s resourcefulness (DV).

**Multicollinearity.** Multicollinearity was examined by evaluating the tolerance test in a series of regression equations. In the current study, all variables had tolerance test values of greater than .10 and values of the Variance Inflation Factors of less than 10, which indicated that there was no multicollinearity in the data. Therefore, the assumption of multicollinearity was not violated. In addition, there were less than two variables that had values of Variance Proportions greater than .9 when the values of the Condition Index were 15 to 30, or higher. In conclusion, the absence of multicollinearity was met.

**Homoscedasticity (constant error variance).** Homoscedasticity was tested by using scatter plots in regression to evaluate an even and random distribution of points across the reference Loess line. This assumption was met because the spread of the scatter of all variables was around the line and was less than a 3-to-1 fan (from the lowest variance scatter to the highest variance scatter) (Fox, 1991).

**Normality of residuals.** Normality of residuals was evaluated by examining histograms and normal probability (P-P) plots of the studentized deleted residuals in regression as well as values of skewness and kurtosis for studentized deleted residuals in frequencies. In the current study, the histograms revealed a normal distribution of the
residuals with a symmetrical bell-shape curve; in addition, the P-P plots showed most values fell along the diagonal line with no substantial departure (Tabachnick & Fidell, 2012). Furthermore, as presented in Tables 4.2, 4.5, and 4.7 and discussed previously, none of variables were skewed greater than absolute values of 3.0 and were kurtotic greater than absolute values 8.0 to 20.0, which would indicate a non-normal distribution (Kline, 2005). Hence, it can be concluded that the assumption of normality of residuals is met.

**Interrelationships among Demographic Characteristics**

Before answering research questions, the followings show the interrelationships among major study variables that are not covered in research questions.

The interrelationships among demographic characteristics of the caregiver-child dyads are presented in Table 4.10. Child’s age and BMI/BMI z-score were not correlated \((r = -.02 \text{ to } .09, p > .05)\), whereas age and body weight were positively correlated \((r = .24, p < .001)\), and the strength was a small to moderately small correlation. Older children had higher body weights. Additionally, a small correlation was observed between children’s BMI/BMI z-score and school performance \((r = -.12 \text{ to } -.14, p < .05)\), caregivers’ age \((r = -.13, p < .05)\), BMI \((r = .27, p < .001)\), education level \((r = -.14 \text{ to } -.15, p < .05)\), and family income \((r = -.11 \text{ to } -.12, p < .05)\). That is, children with a higher BMI/BMI z-score, but not body weight, had lower school performance and lower caregiver education and family income. Moreover, children with higher BMI/BMI z-score or body weight had higher caregiver BMI \((r = .27 \text{ to } .29, p < .001)\). Children’s school performance was positively correlated to their caregivers’ age \((r = .11, p < .05)\), education level \((r = .31, p < .001)\), and family income \((r = .19, p < .001)\). Although the
strength of correlation was in small to medium, children who had better school
performance were from better income families and had older caregivers with a higher
education.

Table 4.10.

Correlation Matrix of the Demographic Characteristics

<table>
<thead>
<tr>
<th>Demographic characteristics</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Child’s age</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Child’s BMI</td>
<td>.09</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Child’s BMI z-score a</td>
<td>-.02</td>
<td>.95***</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Child’s Weight</td>
<td>.24***</td>
<td>.92***</td>
<td>.86***</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. School Performance</td>
<td>.10</td>
<td>-.14**</td>
<td>-.12*</td>
<td>-.09</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Caregiver’s age</td>
<td>.03</td>
<td>-.13*</td>
<td>-.14*</td>
<td>-.12*</td>
<td>.11*</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Caregiver’s BMI</td>
<td>-.03</td>
<td>.27***</td>
<td>.29***</td>
<td>.22***</td>
<td>-.07</td>
<td>.08</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>8. Caregiver’s education</td>
<td>-.002</td>
<td>-.15**</td>
<td>-.14*</td>
<td>-.10</td>
<td>.31***</td>
<td>.19***</td>
<td>-.06</td>
<td>1.00</td>
</tr>
<tr>
<td>9. Family income</td>
<td>-.05</td>
<td>-.12*</td>
<td>-.11*</td>
<td>-.07</td>
<td>.19***</td>
<td>.06</td>
<td>-.10</td>
<td>.49***</td>
</tr>
</tbody>
</table>

* a = BMI z-score converted based upon the WHO reference 2007 (de Onis et al., 2007).
  * p < .05, ** p < .01, *** p < .001.

Among the caregivers’ variables, as depicted in Table 4.10, there was a small to
moderately small correlation between their years of education and age (r = .19, p < .001)
and a moderate to moderately large correlation between their years of education and
family income (r = .49, p < .001). That is, caregivers who had higher education were
older and had higher family income. Lastly, in this caregiver sample, caregivers’ BMI
was not associated with any characteristics of caregivers or family income. In other
words, caregivers’ BMI was not correlated with their age, education, or family income.

Interrelationships among Children’s Age, BMI, Satiety Responsiveness, and

Hunger/Satiety Cues

Satiety responsiveness, a kind of appetitive trait, represents an individual’s
sensitive response to internal satiety signals (Wardle et al., 2001). Satiety responsiveness
(SR; Wardle et al., 2001) measures an individual’s response of internal satiety cues, and
higher sum scores indicate greater responsiveness to satiety and smaller appetite. Greater responsiveness to satiety indicates healthier eating behaviors because greater responsiveness leads to normal energy intake regulation and the stoppage of overeating. Children’s satiety responsiveness was rated from the perspective of both children and caregivers. As displayed in Table 4.11, children’s satiety responsiveness from both perspectives had a moderate correlation ($r = .36$, $p < .001$). In addition, both perspectives of children’s satiety responsiveness had weak to moderate negative correlations with BMI/BMI z-score ($r = -.19$ to -.30, $p < .01$). That is, higher BMI/BMI z-score were associated with weaker satiety responsiveness, indicating that higher BMI/BMI z-score were related to stronger appetite. Interestingly, children’s age did not correlate with either perspective of satiety responsiveness.

Table 4.11.

**Correlation Matrix of Children’s Satiety Responsiveness and Hunger/Satiety Cues**

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Satiety Responsiveness$^a$</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Satiety Responsiveness$^b$</td>
<td></td>
<td>.36***</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Hunger/Satiety Cues</td>
<td></td>
<td>-.14**</td>
<td>-.04</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Age</td>
<td></td>
<td>-.09</td>
<td>-.07</td>
<td>.15**</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>5. BMI</td>
<td></td>
<td>-.20***</td>
<td>-.30***</td>
<td>-.01</td>
<td>.09</td>
<td>1.00</td>
</tr>
<tr>
<td>6. BMI z-score$^c$</td>
<td></td>
<td>-.19**</td>
<td>-.29***</td>
<td>.001</td>
<td>-.02</td>
<td>.95***</td>
</tr>
<tr>
<td>7. Weight</td>
<td></td>
<td>-.22***</td>
<td>-.34***</td>
<td>.01</td>
<td>.26***</td>
<td>.92***</td>
</tr>
</tbody>
</table>

*Note. a = rated by children. b = rated by caregivers. c = BMI z-score converted based upon the WHO reference 2007 (de Onis et al., 2007).*  
*p < .05, ** p < .01, ***p < .001.*

Hunger/satiety cues (HSC) (Tylka, 2006), were also used to measure children’s awareness and use of hunger/satiety cues to determine when and how much to eat. Higher scores indicate greater awareness to internal hunger/satiety cues, which leads to more positive eating behaviors (intuitive eating) (Table 4.11). Surprisingly, children’s hunger/satiety cues had a weak association with children’s satiety responsiveness ($r = -$
indicating children’s higher awareness of internal hunger/satiety cues (more positive eating) was related to weaker satiety responses (bigger appetite). Moreover, no adequate evidence was obtained to show a significant relationship between children’s hunger/satiety cues and BMI/BMI z-score \((r = -.01 \text{ to } .001, p > .05)\). Interestingly, children’s awareness of hunger/satiety cues were significantly associated with their age \((r = .15, p < .01)\). That is, although the strength is low, older children were more keenly aware of their internal hunger and satiety cues (a positive eating – intuitive eating), indicating they tended to trust these signals to guide their eating behaviors and to have intuitive eating.

**Inter-correlations among Children’s Dispositional Optimism, Pessimism, and Caregivers’ Dispositional Pessimism.**

No evidence was found for a relationship between caregivers’ dispositional pessimism and children’s dispositional optimism \((r = -.01, p > .05)\) and pessimism \((r = .06, p > .05)\) (Table 4.12). When examining the relationship between children’s dispositional optimism and pessimism, in the current sample, children’s dispositional optimism was weakly related in a negative direction to dispositional pessimism \((r = -.16, p < .01)\).

Table 4.12.

**Correlation Matrix of Dispositional Optimism and Pessimism**

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Caregivers’ Dispositional Pessimism</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Children’s Dispositional Optimism</td>
<td>-.01</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>3. Children’s Dispositional Pessimism</td>
<td>.06</td>
<td>-.16**</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*Note. * \(p < .05\), ** \(p < .01\), *** \(p < .001\).*
Inter-correlations among Eating Styles

Children’s eating styles. The inter-correlations among children’s BMI/BMI z-score and the three eating styles are presented in Table 4.13. Children’s BMI/BMI z-score were only moderately related to restrained eating ($r = .30$ to $.33$, $p < .001$), indicating that a higher BMI/BMI z-score were associated with restrained eating but not with emotional or external eating. Furthermore, there was a moderate correlation between children’s emotional eating and external eating ($r = .36$, $p < .001$). External eating was negatively related to restrained eating ($r = -.11$, $p < .05$). However, emotional eating was not associated with restrained eating ($r = .08$, $p > .05$). In this sample, children with the tendency toward emotional eating were found to have a higher tendency toward external eating, and a higher tendency toward external eating was related to a lower tendency of restrained eating.

Table 4.13.

**Correlation Matrix of Children’s Eating Styles**

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Weight</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. BMI</td>
<td>.92***</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. BMI z-score</td>
<td>.86***</td>
<td>.95***</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Emotional Eating</td>
<td>-.05</td>
<td>-.02</td>
<td>-.01</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>5. External Eating</td>
<td>-.06</td>
<td>-.01</td>
<td>-.01</td>
<td>.36***</td>
<td>1.00</td>
</tr>
<tr>
<td>6. Restrained Eating</td>
<td>.27***</td>
<td>.30***</td>
<td>.31***</td>
<td>.08</td>
<td>-.11*</td>
</tr>
</tbody>
</table>

*Note. a = BMI z-score converted based upon the WHO reference 2007 (de Onis et al., 2007).

* $p < .05$, ** $p < .01$, *** $p < .001$.

Caregivers’ eating styles. The interrelationship among caregivers’ BMI and their eating styles are presented in Table 4.14. Caregivers’ BMI was related to their restrained eating only ($r = .18$, $p < .01$), but not their emotional and external eating. The strength of relationship was weak (Cohen, 1988). There was a positive correlation between
caregivers’ emotional eating and their external \( r = .57, p < .001 \) and restrained eating \( r = .24, p < .001 \); additionally, external eating was correlated with restrained eating \( r = .25, p < .001 \). Interestingly, caregivers’ three eating styles were inter-correlated and strong relationships were seen between emotional and external eating styles; however, only restrained eating had a significant relationship with their BMI.

Table 4.14.

Correlation Matrix of Caregivers’ Eating Styles

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. BMI</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Emotional Eating</td>
<td>.06</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. External Eating</td>
<td>-.03</td>
<td>.57***</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>4. Restrained Eating</td>
<td>.18**</td>
<td>.24***</td>
<td>.25***</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*Note. * \( p < .05 \), ** \( p < .01 \), *** \( p < .001 \).*

Results of Research Questions

The aims of this study included examining the interrelationships among resourcefulness, academic stress, dispositional optimism, and eating styles of fifth and sixth graders in Taiwan. The mediating effects of process regulators on the relationships between contextual factors and self-control behavior, of self-control behavior on the relationships between process regulators and target behavior, and of process regulators and self-control behavior on the relationships between contextual factors and target behavior were examined. There were nine research questions (RQs), and these were discussed individually.

As described previously, to answer RQs #1 through #3, the independent-sample \( t \)-tests were used to assess the differences between the dichotomous variable and the dependent variable (See Figure 1.2). The Pearson product-moment correlation coefficient was used to detect the interrelationships among the study variables such as those to be
examined in RQs #1 through #6 (See Figure 1.2). To examine the mediating effects of the proposed mediators (RQs #7 through #9) (See Figure 1.3), a series of hierarchical multiple regressions were applied.

The sample size possessed 368 caregiver-child dyads. However, there were missing values across some of the variables. These missing values will cause a different number of cases for each of the regression runs. Therefore, for research questions that were analyzed by regression (RQs #7 through #9), cases that had missing values were automatically excluded by SPSS before subsequent regression runs. Hence, a consistent set of respondents across each regression run was maintained. The number of participants retained in the following series of hierarchical multiple regressions was 246.

To test for an existing mediating effect (RQs #7 through #9) (See Figure 1.3), according to the approach previously proposed by certain scholars (Hayes, 2009; Judd & Kenny, 1981; Kenny, 2012; MacKinnon & Fairchild, 2009; Preacher & Hayes, 2008), the following procedures for a series of hierarchical regressions were processed for each RQ (Figure 4.1): (1) regressing the proposed mediating variable (MV) on the predictors (Regression Equation 1; Figure 4.1, path a), (2) regressing the DV on the MV (Regression Equation 2; Figure 4.1, path b), (3) regressing the dependent variable (DV) on the predictors (Regression Equation 3; Figure 4.1, path c), and (4) regressing the DV on both the predictors and MV (Regression Equation 4; Figure 4.1, path c’).

Additionally, the following three conditions must be met for a mediation effect to be present (Baron & Kenny, 1986; Kenny, 2012; MacKinnon & Fairchild, 2009; Zhao et al., 2010): (1) the predictors must affect the proposed mediator (Regression Equation 1; Figure 4.1, path a), (2) the mediator must affect the DV (Regression Equation 2; Figure
4.1, path b), (3) if these two conditions are met, the effect between the predictors and DV must be dramatically reduced (comparing Equation 3 with Equation 4; Figure 4.1, path c and c’). The results of a sequence of regression equations were presented by each RQ independently.

![Diagram](image)

**Figure 4.1.** Mediating effect of mediator between Predictors and DV.

**RQ #1.** Are intrinsic (children’s age, gender, BMI, satiety responsiveness, and hunger/satiety cues) and extrinsic (caregivers’ resourcefulness, dispositional optimism/pessimism, and eating styles – emotional, external, and restrained) contextual factors associated with process regulators (academic stress and dispositional optimism/pessimism)?

Dichotomous variables included gender, children’s chronic condition, and medication. Gender was coded as 0 and 1 for male and female. Children’s chronic conditions and medication were coded as 0 and 1 as well, with the score of 1 stands for presence of chronic condition/medication and a score of 0 stands for absence of chronic condition/medication. The differences between dichotomous variables of contextual factors, such as gender, chronic conditions, and medication, on the process regulators are presented in Table 4.15, and the relationships between contextual factors and process regulators are displayed in Table 4.16.

As shown in Table 4.15, on average more academic stress was experienced among children who reported chronic conditions \(t (356) = -1.98, p < .05\). Other
dichotomous contextual factors, such as gender and children’s medication, did not show any differences on academic stress. In the current sample, no dichotomous contextual factors had any differences on dispositional pessimism. However, dispositional optimism was reported as higher among the children who had no chronic conditions \( t (349) = 2.39, p < .05 \). Other dichotomous variables, such as gender and whether or not the children take medication regularly, did not show significant differences on dispositional optimism.

For instance, a child’s gender did not make any difference on reported dispositional optimism.

Table 4.15.

*Differences on the Process Regulators among Dichotomous Variables*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Process Regulators</th>
<th>n</th>
<th>Mean (SD)</th>
<th>t</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Academic Stress</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child’s Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys (0)</td>
<td></td>
<td>161</td>
<td>8.39 (5.51)</td>
<td>- .68</td>
<td>358</td>
</tr>
<tr>
<td>Girls (1)</td>
<td></td>
<td>199</td>
<td>8.78 (5.50)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child’s Chronic Condition</td>
<td></td>
<td></td>
<td></td>
<td>-1.98*</td>
<td>356</td>
</tr>
<tr>
<td>No (0)</td>
<td></td>
<td>326</td>
<td>8.43 (5.52)</td>
<td></td>
<td></td>
</tr>
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Table 4.15.

*Differences on the Process Regulators among Dichotomous Variables (cont’d)*

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<td>36.39 (13.08)</td>
<td>.03</td>
<td>351</td>
</tr>
<tr>
<td>Girls (1)</td>
<td>192</td>
<td>36.44 (12.45)</td>
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<td>349</td>
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<td>32.18 (12.11)</td>
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</table>

*Note.* *p* < .05.

While children’s BMI was not related to their academic stress (*r* = .10, *p* > .05), children’s BMI z-score had a significant correlation with academic stress (*r* = .11, *p* < .05). According to Cohen (1988), the strength of this relationship would be considered weak. Significant correlations were found between children’s self-rated satiety responsiveness (an appetite trait) and their academic stress (*r* = .23, *p* < .001) and dispositional optimism (*r* = -.15, *p* < .01) (See Table 4.16). Although the correlation coefficients were reliable, the strengths of correlations between children’s satiety responsiveness and academic stress as well as dispositional optimism were small to moderately small. This finding indicates that if children have stronger satiety responsiveness (smaller appetite); it can be related to higher levels of academic stress and lower levels of dispositional optimism. In addition, a higher level of hunger/satiety cues (a dimension of intuitive eating – positive eating) among children was correlated moderately with a greater degree of dispositional optimism (*r* = .36, *p* < .001). As for school performance, the children who had better academic performance had lower
academic stress \((r = -.12, p < .05)\) and higher dispositional optimism \((r = .22, p < .001)\); however, these two relationships are also considered small to moderately small. Lastly, there was no adequate evidence to show the relationships between the other intrinsic contextual factors (i.e. children’s age and satiety responsiveness rated by caregivers) and the process regulators were correlated.

Table 4.16.

**Correlation of the Contextual Factors and Process Regulators \((N = 368)\)**

<table>
<thead>
<tr>
<th>Contextual Factors</th>
<th>Process Regulators</th>
<th>Academic Stress</th>
<th>Dispositional Pessimism</th>
<th>Dispositional Optimism</th>
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<tr>
<td>Age</td>
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<td>.06</td>
</tr>
<tr>
<td>BMI</td>
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<td>.10</td>
<td>.09</td>
<td>.03</td>
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<td>BMI z-score(^a)</td>
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<td>.11(^*)</td>
<td>.10</td>
<td>.04</td>
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<td>.23(***)</td>
<td>-.01</td>
<td>-.15(**)</td>
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<td>Satiety Responsiveness (rated by CG)</td>
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<td>-.08</td>
<td>-.03</td>
</tr>
<tr>
<td>Hunger/Satiety Cues</td>
<td></td>
<td>-.06</td>
<td>-.03</td>
<td>.36(***)</td>
</tr>
<tr>
<td>School Performance</td>
<td></td>
<td>-.12(^*)</td>
<td>.01</td>
<td>.22(***)</td>
</tr>
<tr>
<td><strong>Extrinsic Factors(^b)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>Age</td>
<td></td>
<td>-.05</td>
<td>-.02</td>
<td>-.003</td>
</tr>
<tr>
<td>BMI</td>
<td></td>
<td>.09</td>
<td>-.10</td>
<td>.02</td>
</tr>
<tr>
<td>Education</td>
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<td>-.16(**)</td>
<td>-.06</td>
<td>.05</td>
</tr>
<tr>
<td>Family Income</td>
<td></td>
<td>-.12(^*)</td>
<td>-.03</td>
<td>.16(**)</td>
</tr>
<tr>
<td>Resourcefulness Skills</td>
<td></td>
<td>.000</td>
<td>-.07</td>
<td>.12(^*)</td>
</tr>
<tr>
<td>Dispositional Pessimism</td>
<td></td>
<td>.07</td>
<td>.06</td>
<td>-.01</td>
</tr>
<tr>
<td>Eating Styles</td>
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<td></td>
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<tr>
<td>Emotional Eating</td>
<td></td>
<td>-.10</td>
<td>-.08</td>
<td>-.02</td>
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<tr>
<td>External Eating</td>
<td></td>
<td>-.08</td>
<td>-.07</td>
<td>.03</td>
</tr>
<tr>
<td>Restrained Eating</td>
<td></td>
<td>.04</td>
<td>-.02</td>
<td>.10</td>
</tr>
</tbody>
</table>

*Note. \(^a\) = BMI z-score converted based upon the WHO reference 2007 (de Onis et al., 2007). \(^b\) = caregivers’ variables.  
\(^* p < .05\), \(^** p < .01\), \(^*** p < .001\).*

Among the extrinsic contextual factors, although the correlations were weak (Cohen, 1988), lower academic stress in children was significantly related to a higher level of caregiver’s education \((r = -.16, p < .01)\) and family income \((r = -.12, p < .05)\)
(See Table 4.16). Children’s dispositional optimism was related to family income ($r = .13$, $p < .05$) and caregivers’ resourcefulness skills ($r = .12$, $p < .05$). In spite of weak relationships, higher levels of academic stress among children were correlated with lower levels of education among their caregivers as well as lower levels of family income. Besides, having higher degrees of dispositional optimism among the children was associated with a higher amount of family income and higher levels of caregivers’ resourcefulness skills. Surprisingly, there is no adequate evidence to show that both children’s pessimism and optimism have significant relationships with caregivers’ pessimism.

**RQ #2. Are intrinsic (children’s age, gender, BMI, satiety responsiveness, and hunger/satiety cues) and extrinsic (caregivers’ resourcefulness, dispositional optimism/pessimism, and eating styles – emotional, external, and restrained) contextual factors associated with self-control behavior (children’s resourcefulness skills)?**

The differences between dichotomous variables, such as gender, chronic condition, and medication, on the children’s self-control behavior are presented in Table 4.17. The result of the correlation analysis among continuous contextual factors and children’s self-control behavior is presented in Table 4.18.

As depicted in Table 4.17, on average, children’s resourcefulness skills were different by gender [$t (349) = -2.31$, $p < .05$]. That is, girls had a higher level of resourcefulness skills than boys. Other dichotomous variables, such as children’s chronic condition, medical history, and caregivers’ gender, showed no differences in terms of children’s resourcefulness skills.
Table 4.17.

*Differences on the Resourcefulness Skills among Dichotomous Variables (N = 368)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>Mean (SD)</th>
<th>t</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child’s Gender</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>158</td>
<td>22.63 (7.65)</td>
<td>-2.31*</td>
<td>349</td>
</tr>
<tr>
<td>Girls</td>
<td>193</td>
<td>24.45 (7.09)</td>
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<td></td>
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<tr>
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<td></td>
<td></td>
<td>1.03</td>
<td>347</td>
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<tr>
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<td>319</td>
<td>23.72 (7.37)</td>
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<td></td>
</tr>
<tr>
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<td>30</td>
<td>22.27 (7.57)</td>
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<tr>
<td>Child’s Medication</td>
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<td>-.24</td>
<td>347</td>
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<tr>
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<td>335</td>
<td>23.58 (7.46)</td>
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<tr>
<td>Yes</td>
<td>14</td>
<td>24.07 (5.58)</td>
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<td>-.41</td>
<td>349</td>
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<td>Male</td>
<td>71</td>
<td>23.31 (6.99)</td>
<td></td>
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<tr>
<td>Female</td>
<td>280</td>
<td>23.71 (7.50)</td>
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</table>

*Note.* *p* < .05.

According to the correlation findings (See Table 4.18), only children’s reported satiety responsiveness (an appetite trait) and hunger/satiety cues (one dimension of intuitive eating) had significant relationships with their resourcefulness skills, but, the relationships would be considered moderately small (Cohen, 1988). A higher level of resourcefulness skills was related to a weaker satiety responsive (bigger appetite) (*r* = -.19, *p* < .001) and a higher degree of hunger/satiety cues (more positive eating) (*r* = .21, *p* < .001). Surprisingly, evidence was deficient in supporting the significant relationships between children’s resourcefulness skills and their age, school performance, or BMI/BMI z-score; additionally, children’s resourcefulness skills were found to have no correlation with their caregivers’ age, gender, educational level, socioeconomic background, or resourcefulness.
Table 4.18.

**Correlation of the Contextual Factors and Resourcefulness Skills (N = 368)**

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<th>Children’s Resourcefulness Skills</th>
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<td>Age</td>
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<td>BMI z-score(^a)</td>
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<td>Satiety Responsiveness</td>
<td>-.19***</td>
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<td>Satiety Responsiveness (rated by CG)</td>
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<td>Hunger/Satiety Cues</td>
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<td><strong>Extrinsic Factors(^b)</strong></td>
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<td>Age</td>
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<td>BMI</td>
<td>.05</td>
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<td>Education</td>
<td>.003</td>
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<td>Family Income</td>
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<td>External Eating</td>
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<td>Restrained Eating</td>
<td>-.07</td>
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</table>

*Note. a = BMI z-score converted based upon the WHO reference 2007 (de Onis et al., 2007). b = caregivers’ variables.
* \(p < .05\), ** \(p < .01\), *** \(p < .001\).*

**RQ #3.** Are intrinsic (children’s age, gender, BMI, satiety responsiveness, and hunger/satiety cues) and extrinsic (caregivers’ resourcefulness, dispositional optimism/pessimism, and eating styles – emotional, external, and restrained) contextual factors associated with target behavior (children’s eating styles – emotional, external, and restrained)?

The results of the mean differences between dichotomous variables -- such as gender, chronic condition, and medication -- on children’s self-control behavior are displayed in Table 4.19. The results of the correlation analysis among contextual factors and the children’s eating styles are shown in Table 4.20.
Table 4.19.

*Differences in the Children’s Eating Styles among Dichotomous Variables*

<table>
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<td>11.34 (2.73)</td>
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<td></td>
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</tr>
<tr>
<td>No</td>
<td>343</td>
<td>9.40 (3.04)</td>
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<td>358</td>
</tr>
<tr>
<td>Yes</td>
<td>14</td>
<td>9.41 (3.52)</td>
<td></td>
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<tr>
<td>Caregiver’s Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>69</td>
<td>9.83 (3.31)</td>
<td>1.25</td>
<td>360</td>
</tr>
<tr>
<td>Female</td>
<td>293</td>
<td>9.31 (2.99)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* *p* < .05.

Among the dichotomous contextual factors, a significant mean difference only existed between children’s medication and external eating \[t (359) = -2.17, p < .05\] (See
Table 4.19). Interestingly, this finding indicated that more external eating occurred among children who took medication. Other dichotomous contextual factors examined in the study, such as gender and chronic condition, did not have differences on external eating. As for emotional and restrained eating, no dichotomous contextual factors were found to reveal any differences on these two types of eating style.

Table 4.20

*Correlation of the Contextual Factors and Eating Styles (N = 368)*

<table>
<thead>
<tr>
<th>Contextual Factors</th>
<th>Emotional Eating</th>
<th>External Eating</th>
<th>Restrained Eating</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intrinsic Factors</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Age</td>
<td>.02</td>
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<td>.03</td>
</tr>
<tr>
<td>BMI</td>
<td>-.02</td>
<td>-.01</td>
<td>.30***</td>
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<td>BMI z-score</td>
<td>-.01</td>
<td>-.01</td>
<td>.31***</td>
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<td>.004</td>
<td>.01</td>
<td>.23***</td>
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<td>.01</td>
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<td>-.08</td>
<td>.04</td>
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<td>-.09</td>
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<td><strong>Extrinsic Factors</strong></td>
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<td>Age</td>
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<td>.07</td>
<td>-.05</td>
</tr>
<tr>
<td>BMI</td>
<td>-.09</td>
<td>-.04</td>
<td>.14**</td>
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<td>-.03</td>
<td>-.02</td>
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<td>.02</td>
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<td>.03</td>
<td>.06</td>
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<tr>
<td>Dispositional Pessimism</td>
<td>.07</td>
<td>.08</td>
<td>.05</td>
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<td>Eating Styles</td>
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<td>.03</td>
<td>.03</td>
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<td>External Eating</td>
<td>-.03</td>
<td>.06</td>
<td>.08</td>
</tr>
<tr>
<td>Restrained Eating</td>
<td>-.15**</td>
<td>-.004</td>
<td>.12*</td>
</tr>
</tbody>
</table>

*Note. a = caregivers’ variables.*

* p < .05, ** p < .01, ***p < .001.

According to the results of correlation analyses (Table 4.20), among the intrinsic contextual factors, children’s school performance was the only variable that had a significant relationship with emotional eating (*r* = -.11, *p* < .05). Although the correlation
was weak, this finding suggested that children who were emotional eaters had poorer school performance as compared with those who were not emotional eaters.

Intrinsic factors and external eating were not found to be related. As for children’s restrained eating, no significant correlations were found among the intrinsic contextual factors except BMI, BMI z-score, and satiety responsiveness (an appetite trait).

Children’s restrained eating was positively related to their BMI ($r = .30$, $p < .001$), BMI z-score ($r = .31$, $p < .001$), and satiety responsiveness ($r = .23$, $p < .001$). Thus, the moderate (BMI/BMI z-score and restrained eating) to moderately small (satiety responsiveness and restrained eating) correlations suggested that the children who were restrained eaters had higher BMI levels and stronger satiety responsiveness (smaller appetite).

Unexpectedly, with regard to the relationships between children’s BMI status and three eating styles, children’s BMI status was related to restrained eating only not to emotional or external eating styles. A significant small, negative correlation between children’s emotional eating and caregivers’ restrained eating was found ($r = -.15$, $p < .01$), but there was no correlation between children’s emotional eating and their caregivers’ emotional eating (See Table 4.20). Furthermore, children’s restrained eating had a positively significant association with caregivers’ BMI ($r = .14$, $p < .01$) and caregivers’ restrained eating ($r = .12$, $p < .05$). These weak relationships indicated that children who were restrained eaters also reported a higher level of caregivers’ BMI. Additionally, the tendency among children toward being restrained eaters was associated with their caregivers’ also having a higher tendency of being restrained eaters. A significant correlation between children’s external eating and extrinsic contextual factors was not
supported. Surprisingly, only children’s restrained eating had a significant but weak association with their caregivers’ restrained eating; while children’s emotional eating and caregivers’ emotional, as well as children’s external eating and caregivers’ external eating did not have significant relationships.

RQ #4. What are the strengths and directions of the relationships between process regulators (academic stress and dispositional optimism/pessimism) and the self-control behavior (children’s resourcefulness skills)?

The correlation result is displayed in Table 4.21. Children’s resourcefulness skills were correlated with their academic stress \( (r = .25, p < .001) \), dispositional pessimism \( (r = .15, p < .01) \), and dispositional optimism \( (r = .40, p < .001) \). The findings indicated that the strength of relationships between children’s resourcefulness skills and three process regulators (academic stress and dispositional optimism/pessimism) were small to moderate, and having greater resourcefulness skills was related to lower levels of academic stress and pessimism and a higher level of optimism among the children.

Table 4.21.

**Correlation of the Process Regulators and Resourcefulness Skills \( (N = 368) \)**

<table>
<thead>
<tr>
<th>Process Regulators</th>
<th>Resourcefulness Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Stress</td>
<td>-.25***</td>
</tr>
<tr>
<td>Dispositional Pessimism</td>
<td>-.15**</td>
</tr>
<tr>
<td>Dispositional Optimism</td>
<td>.40***</td>
</tr>
</tbody>
</table>

*Note. * \( p < .05 \), ** \( p < .01 \), *** \( p < .001 \).*
RQ #5. What are the strengths and directions of the relationships between process regulators (academic stress and dispositional optimism/pessimism) and the target behavior (children’s eating styles – emotional, external, and restrained)?

A correlation result is present in Table 4.22. Among the process regulators, a weak, positive relationship was found between children’s emotional eating and academic stress. That is, emotional eaters had a higher level of academic stress ($r = .15, p < .01$). However, the other two process regulators (dispositional pessimism and dispositional optimism) were not associated with children’s emotional eating.

As presented in Table 4.22, both children’s external eating and restrained eating were significantly associated with academic stress and dispositional optimism. External eating was positively related with academic stress ($r = .17, p < .001$) and a negatively related with dispositional optimism ($r = -.14, p < .01$); additionally, the magnitude of both relationships was small. That is, a higher tendency of external eating was associated with a higher level of academic stress and a lower level of dispositional optimism.

Table 4.22.

<table>
<thead>
<tr>
<th>Process Regulators</th>
<th>Emotional Eating</th>
<th>External Eating</th>
<th>Restrained Eating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Stress</td>
<td>.15**</td>
<td>.17**</td>
<td>.14*</td>
</tr>
<tr>
<td>Dispositional Pessimism</td>
<td>.06</td>
<td>.02</td>
<td>-.04</td>
</tr>
<tr>
<td>Dispositional Optimism</td>
<td>.01</td>
<td>-.14**</td>
<td>.11*</td>
</tr>
</tbody>
</table>

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Similar to external eating, restrained eating not only had a positive relationship with academic stress ($r = .14, p < .05$), but it also had a positive relationship with dispositional optimism ($r = .11, p < .05$). While the magnitude was weak, the findings
indicated that children who were restrained eaters had a higher degree of academic stress and greater dispositional optimism. Dispositional pessimism, one of the process regulators, was not associated with any of the eating styles.

**RQ #6. What is the strength and direction of the relationship between self-control behavior (children’s resourcefulness skills) and the target behavior (children’s eating styles – emotional, external, and restrained Eating)?**

Results from the correlation analysis are presented in Table 4.23. Significant correlations were found between resourcefulness skills and emotional and external eating among the children in the current study, but not with restrained eating. Children’s resourcefulness was negatively associated with their emotional \((r = -.16, p < .01)\) and external eating \((r = -.43, p < .001)\); however, the strength of correlation would be considered as small to medium (Cohen, 1988). Thus, higher resourcefulness in children was correlated with a lower tendency to be emotional and external eaters.

Table 4.23.

*Correlation of the Resourcefulness Skills and Eating Styles (N = 368)*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Children’s Eating Styles</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Emotional Eating</td>
</tr>
<tr>
<td>Resourcefulness Skills</td>
<td>-.16**</td>
</tr>
</tbody>
</table>

*Note. * \(p < .05\), ** \(p < .01\), *** \(p < .001\).*
RQ #7. While controlling for covariates, how do process regulators (academic stress and dispositional optimism/pessimism) mediate intrinsic (children’s age, gender, BMI, satiety responsiveness, and hunger/satiety cues) and extrinsic (caregivers’ resourcefulness, dispositional optimism/pessimism, and eating styles – emotional, external, and restrained) contextual factors on self-control behavior (children’s resourcefulness skills)?

A single/simple mediation model (Hayes, 2009; Preacher & Hayes, 2008) was applied to uncover the mediating effects of each individual process regulator on the relationships between contextual factors and children’s resourcefulness skills (See Figure 4.2) while controlling for covariates. That is, a single/simple mediation model was applied three times to test each process regulator’s mediating effect.

A series of hierarchical regressions were performed according to the approaches proposed by multiple scholars (Baron & Kenny, 1986; Hayes, 2009; Judd & Kenny, 1981; Kenny, 2012; MacKinnon & Fairchild, 2009): (1) regressing each putative mediator (i.e. academic stress, dispositional pessimism, and dispositional optimism) (DV) separately on the contextual factors (predictors) (first block) while controlling for covariates (second block) (Regression Equation 1; See Figure 4.2, path a), (2) regressing children’s resourcefulness skills (DV) on putative mediators (i.e. academic stress, dispositional
pessimism, and dispositional optimism) (Regression Equation 2; See Figure 4.2, path b), (3) regressing children’s resourcefulness skills (DV) on the contextual factors (first block) while controlling for covariates (second block) (Regression Equation 3; See Figure 4.2, path c), and (4) regressing children’s resourcefulness skills (DV) on both the contextual factors (predictors) (first block) and each process regulator separately (third block) while controlling for covariates (second block) (Equation 4; See Figure 4.2, path c').

Mediating effects were determined by comparing the standardized coefficients (Betas, βs) of Equations 3 and 4 (See Figure 4.2, paths c and c’) and observing a decreased Beta (β) for Equation 4 (path c’) if the following conditions were met: (1) if there are significant direct effects of contextual factors on process regulators (putative mediators) (See Figure 4.2, path a), and (2) there are significant direct effects of process regulators (putative mediators) on children’s resourcefulness skills (path b).

Table 4.24.
Mediating Effect of Academic Stress on Contextual Factors and Resourcefulness Skills

<table>
<thead>
<tr>
<th>Equation (DV)</th>
<th>Path</th>
<th>Predictor</th>
<th>B</th>
<th>SE B</th>
<th>Beta (β)</th>
<th>R²</th>
<th>ΔR²</th>
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<td></td>
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<td>.62</td>
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<td>.72</td>
<td>.03</td>
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<tr>
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<td>BMI z-score</td>
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<td>.09</td>
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</tr>
<tr>
<td></td>
<td></td>
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<td>.34</td>
<td>.10</td>
<td>.23**</td>
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<td>.11</td>
<td>.003</td>
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<tr>
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<td></td>
<td>Hunger/Satiety Cues</td>
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<td>.08</td>
<td>-.03</td>
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<tr>
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<td>.01</td>
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<td>.20</td>
<td>-.03</td>
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<td></td>
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<td>.05</td>
<td>-.19*</td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>External Eating</td>
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<td>.10</td>
<td>.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Restrained Eating</td>
<td>.07</td>
<td>.06</td>
<td>.09</td>
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<td>2</td>
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<td>.09</td>
<td>-.26***</td>
<td>.07</td>
<td>.07***</td>
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</table>

213
Table 4.24.

*Mediating Effect of Academic Stress on Contextual Factors and Resourcefulness Skills (cont’d)*

<table>
<thead>
<tr>
<th>Equation (DV)</th>
<th>Path</th>
<th>Predictor</th>
<th>B</th>
<th>SE B</th>
<th>Beta (β)</th>
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<th>$\Delta R^2$</th>
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<tr>
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<td>.15</td>
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<td>-.06</td>
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<td>.14</td>
<td>-.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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<td>Restrained Eating</td>
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<td>.08</td>
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<td></td>
<td>Academic Stress</td>
<td>-.34</td>
<td>.09</td>
<td>-.24***</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* a = satiety responsiveness rated by the caregiver. b = caregivers’ variables. c = control variables included children’s school performance, chronic condition, medication, and caregivers’ age, gender, BMI, education, and family income.  
* *p < .05, **p < .01, ***p < .001.

**Academic stress as a mediator.** The result of the hierarchical regression is presented in Table 4.24. While controlling for covariates, children’s self-reported satiety responsiveness (an appetite trait) was the only one intrinsic contextual factor found to have a **direct** effect on academic stress ($\beta = .23, p < .01$) when all the contextual factors were entered simultaneously in the model (Table 4.24, Equation 1, path a). Additionally,
children’s self-reported satiety responsiveness had a **direct** negative effect on their resourcefulness skills ($\beta = -.21, p < .01$) while controlling for covariates (Table 4.24, Equation 3, path c). A mediator effect of academic stress existed if academic stress had a direct effect on resourcefulness skills (Table 4.24, Equation 2, path b); additionally, there was a change in the relationship between contextual factors and resourcefulness skills after including academic stress into the model (Table 4.24, Equation 4, path c’).

As depicted in Table 4.24 (Equation 2, path b), academic stress had a significant **direct** effect on resourcefulness skills ($\beta = -.26, p < .001$). Moreover, when academic stress was entered into the regression model, the overall model was statistically significant with 15% variance in children’s resourcefulness skills explained. An additional 5% of the variance was explained by academic stress (Equation 4). In the overall model, children’s satiety responsiveness still contributed significantly to the prediction of resourcefulness skills ($\beta = -.16, p < .05$). Furthermore, the effects of satiety responsiveness on resourcefulness skills were **attenuated** by academic stress with a slight change in the Beta ($\beta$) from -.21 to -.16. That is, the strength of the relationship between satiety responsiveness and resourcefulness skills was **reduced** when academic stress was added into the model. Moreover, according to Equation 4 (See Table 4.24), the Beta ($\beta$) for academic stress ($\beta = -.24, p < .001$) was larger than the Beta ($\beta$) for children’s satiety responsiveness ($\beta = -.16, p < .05$).

Hence, academic stress partially mediated the relationship between children’s satiety responsiveness (an appetite trait) and resourcefulness skills while controlling for other factors. That is, children’s satiety responsiveness not only had a **direct** negative effect but also an **indirect** effect on resourcefulness skills through academic stress.
Children with **stronger** satiety responses (smaller appetite) had **lower** levels of resourcefulness skills; in addition, children with **stronger** satiety responses (smaller appetite) had a **higher** academic stress, which led to a lower resourcefulness skills. The mediating effect of academic stress between children’s satiety responsiveness and resourcefulness skills is shown in Figure 4.3.

![Figure 4.3](image-url)

**Figure 4.3.** Mediating effect of academic stress between satiety responsiveness and resourcefulness skills. $c' = -.16^*$, $c = -.21^{**}$.

* $p < .05$, ** $p < .01$, *** $p < .001$.

According to Table 4.24 (Equation 1, path a), caregivers’ emotional eating was the only one extrinsic contextual factor found to have a **direct** effect on academic stress ($\beta = -.19$, $p < .01$) when all contextual factors were entered simultaneously in the regression while controlling for covariates. However, caregivers’ emotional eating did not have a direct effect on children’s resourcefulness skills ($\beta = -.02$, $p > .05$) (See Table 4.24, Equation 3, path c). As suggested by multiple scholars (Hayes, 2009; Kenny, 2012; MacKinnon et al., 2007; MacKinnon & Fairchild, 2009; Zhao et al., 2010), it is possible that significant mediation exists while the requirement of a significant relationship between predictors and the DV does **not** need to be present. A significant relationship between academic stress and resourcefulness skills was found ($\beta = -.26$, $p < .001$) (See Table 4.19, Equation 2, path b). Therefore, the test for mediation (Table 4.24, Equation 4, path $c'$) was performed.
It was found that caregivers’ emotional eating did not have a direct effect on children’s resourcefulness (β = -.06, p > .05) after adding academic stress into the model (See Table 4.24, Equation 4). In summary, caregivers’ emotional eating had a direct effect on children’s academic stress and children’s academic stress had a direct effect on children’s resourcefulness. Hence, it was concluded that caregivers’ emotional eating did not have a direct effect but had an indirect effect on children’s resourcefulness skills through academic stress. The relationship among academic stress, caregivers’ emotional eating, and children’s resourcefulness skills is illustrated in Figure 4.4.

Table 4.25.

Mediating Effect of Dispositional Pessimism on Contextual Factors and Resourcefulness Skills

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<tr>
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Table 4.25.

*Mediating Effect of Dispositional Pessimism on Contextual Factors and Resourcefulness Skills (cont’d)*

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*Note.* a = satiety responsiveness rated by the caregiver. b = caregivers’ variables. c = control variables included children’s school performance, chronic condition, medication, and caregivers’ age, gender, BMI, education, and family income. *p < .05, **p < .01, ***p < .001.

**Dispositional pessimism as a mediator.** A series of hierarchical regressions were conducted to examine the mediating effect of dispositional pessimism on the relationship between contextual factors and resourcefulness skills while controlling for covariates.

As visible in Table 4.25, although caregivers’ report of children’s satiety responsiveness contributed to children’s dispositional pessimism (β = -.16, p < .05) (Equation 1, path a), dispositional pessimism did **not** contribute to children’s
resourcefulness skills ($\beta = -.11, p < .05$) (Table 4.25, Equation 2, path b). Because there were no significant relationship between the putative mediator (dispositional pessimism) and the dependent variable (resourcefulness skills), according to the requirements for mediation (Baron & Kenny, 1986; Kenny, 2012; MacKinnon & Fairchild, 2009; Zhao et al., 2010), it was concluded that there was no mediating effect by dispositional pessimism on the relationship between contextual factors and resourcefulness skills. Hence, there was no need to proceed with the Equation 4 (path c’) to test for mediation.

**Dispositional optimism as a mediator.** The results of a series of hierarchical regressions are presented in Table 4.26. While controlling for covariates, among the contextual factors, children’s hunger/satiety cues ($\beta = .26, p < .001$) were found to have a direct effect on dispositional optimism (Equation 1, path a). That is, children who had higher levels of awareness of hunger/satiety cues (higher tendency toward a healthy eating – intuitive eating) had higher dispositional optimism. Additionally, children’s hunger/satiety cues had no direct effects on children’s resourcefulness skills (Equation 3, path c). Dispositional optimism was found to have a direct effect on resourcefulness skills ($\beta = .40, p < .001$) (Equation 2, path b). Hence, the vital conditions for mediation proposed by scholars (Baron & Kenny, 1986; Kenny, 2012; MacKinnon & Fairchild, 2009; Zhao et al., 2010) were met. When dispositional optimism was entered into the regression model examining the relationship between contextual factors and resourcefulness skills, the overall regression model was statistically significant with 24% of the variance in children’s resourcefulness skills explained (Equation 4, path c’). An additional 13% of variance was explained by dispositional optimism ($\beta = .41, p < .001$).
Table 4.26.

Mediating Effect of Dispositional Optimism on Contextual Factors and Resourcefulness Skills

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**Mediating Effect of Dispositional Optimism on Contextual Factors and Resourcefulness Skills (cont’d)**

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*Note. a = rated by the caregiver. b = caregivers’ variables. c = control variables included children’s school performance, chronic condition, medication, and caregivers’ age, gender, BMI, education, and family income.

$\ast p < .05, \ast\ast p < .01, \ast\ast\ast p < .001.$

Since a significant relationship between the predictors and the DV is **not** required for examining mediation (Hayes, 2009; Kenny, 2012; MacKinnon et al., 2007; MacKinnon & Fairchild, 2009; Zhao et al., 2010), it was concluded that children’s hunger/satiety cues had **no** direct effect but had an **indirect** effect on resourcefulness skills through dispositional optimism. The interrelationship among children’s hunger and resourcefulness skills, dispositional optimism, and resourcefulness skills is shown in Figure 4.5.

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**Figure 4.5.** Mediating effects of dispositional optimism between hunger/satiety cues and resourcefulness skills. c’ = .01, c = .11.

$\ast p < .05, \ast\ast p < .01, \ast\ast\ast p < .001.$
In summary, academic stress and dispositional optimism were two process regulators that had mediating effects on the relationships between some contextual factors (e.g., satiety responsiveness, hunger/satiety cues, and caregivers’ emotional eating) and resourcefulness skills. The overall model of relationships between contextual factors, process regulators, and resourcefulness is presented in Figure 4.6.

RQ #8. How does self-control behavior (children’s resourcefulness skills) mediate process regulators (academic stress and dispositional optimism/pessimism) on target behavior (children’s eating styles – emotional, external, and restrained)?

The hierarchical multiple regression analyses were conducted to evaluate how much of the proportion of variance in each eating style was explained by resourcefulness skills after controlling for process regulators (See Figure 4.7). This analysis followed the steps as described previously (RQ #7).
As shown in Table 4.27 (Equation 1, path a), academic stress and dispositional optimism were found to have direct influences on resourcefulness skills and accounted for a significant 20% of the variance in resourcefulness. Academic stress had a negative \textbf{direct} effect on resourcefulness skills ($\beta = -.21, p < .01$); higher academic stress was related to lower resourcefulness skills. Dispositional optimism had a positive, \textbf{direct} effect on resourcefulness skills ($\beta = .37, p < .001$); that is, higher dispositional optimism was associated with higher resourcefulness skills.

\begin{table}
\begin{tabular}{|c|c|c|c|c|c|c|}
\hline
\textbf{Equation (DV)} & \textbf{Path} & \textbf{Predictor} & \textbf{B} & \textbf{SE B} & \textbf{Beta (\beta)} & \textbf{$R^2$} & \textbf{$\Delta R^2$} \\
\hline
1 & a & Academic Stress & -.29 & .08 & -.21** & .20 & .20*** \\
& & Dispositional Pessimism & .03 & .21 & .01 & & \\
& & Dispositional Optimism & .22 & .04 & .37*** & & \\
\hline
\end{tabular}
\end{table}

\textit{Note.} * $p < .05$, ** $p < .01$, ***$p < .001$.

\textbf{Emotional eating.} As described above, academic stress and dispositional optimism were found to have a \textbf{direct} effect on resourcefulness skills (See Table 4.27, Equation 1, path a). In addition, resourcefulness skills were found to have a \textbf{direct} effect on emotional eating ($\beta = -.16, p < .05$) (See Table 4.28, Equation 2, path b). Hence, the criteria for testing mediation were met (Hayes, 2009; Kenny, 2012; MacKinnon et al., 2007; MacKinnon & Fairchild, 2009; Zhao et al., 2010), and the test mediation was done.
According to Table 4.28 (Equation 3, path c), among the process regulators, academic stress was the only one that had a direct effect on emotional eating ($\beta = .14, p < .05$). After adding resourcefulness skills (putative mediator) into the model to examine its effects on the relationship between process regulators and emotional eating (See Table 4.28, Equation 4, path $c'$), the overall model was found to be significant with a 5% of the variance in emotional eating explained. An additional 2% variance was explained by resourcefulness skills.

![Figure 4.8. Mediating effect of resourcefulness skills between academic stress and emotional eating. c' = .11; c = .14*. * p < .05, ** p < .01, ***p < .001.](image-url)
As a significant relationship between the predictor and DV is not necessary when examining mediation (Hayes, 2009; Kenny, 2012; MacKinnon et al., 2007; MacKinnon & Fairchild, 2009; Zhao et al., 2010), a mediating effect of resourcefulness skills on the relationships between academic stress and emotional eating and between dispositional optimism and emotional eating was supported. According to Table 4.28 (Equations 3 and 4), there were changes in the relationships (Beta, β) between academic stress and emotional eating (from .14 to .11). Hence, it was concluded that resourcefulness skills completely mediated the relationship between academic stress and emotional eating. However, resourcefulness skills did not mediate the relationship between dispositional optimism and emotional eating because the relationship between dispositional optimism and emotional eating became stronger (from .03 to .10) (See Table 4.28, Equations 3 and 4) when resourcefulness skills were added to the regression model and the relationship between dispositional optimism and emotional eating was improved. The tests of the mediating effects of resourcefulness skills between academic stress/dispositional optimism and emotional eating are shown in Figure 4.8 and Figure 4.9, respectively.

Academic stress had a direct effect on emotional eating and an indirect effect through resourcefulness skills on emotional eating (Figure 4.8). Dispositional optimism

![Figure 4.9. Mediating effect of resourcefulness skills between dispositional optimism and emotional eating. c’ = .10; c = .03.
* p < .05, ** p < .01, ***p < .001.](image)
had no direct effect on emotional eating but it had an indirect effect on emotional eating through resourcefulness skills (Figure 4.9). That is, children with higher academic stress had lower resourcefulness skills, which increased their tendency toward emotional eating; additionally, higher academic stress contributed directly to an increased tendency toward emotional eating. Likewise, children with higher dispositional optimism had higher resourcefulness skills, which decreased their tendency toward being emotional eaters. The overall model of relationships between progress regulators and emotional eating is shown in Figure 4.10.

**Figure 4.10.** Relationships among process regulators, self-control behavior, and emotional eating. † denotes a significant relationship presented initially but became non-significant in the overall mediation model. ‡ denotes non-significant relationships before and after examining mediation model.

**External eating.** As described above, academic stress and dispositional optimism had direct effects on resourcefulness skills (See Table 4.27, Equation 1, path a). According to Table 4.29 (Equation 2, path b), resourcefulness skills had a direct effect on external eating ($\beta = .44, p < .001$). The mediation analysis could therefore be conducted because the criteria for testing mediation were met (Hayes, 2009; Kenny, 2012; MacKinnon et al., 2007; MacKinnon & Fairchild, 2009; Zhao et al., 2010).
Table 4.29.

*Mediating Effect of Resourcefulness Skills on Process Regulators and External Eating*

<table>
<thead>
<tr>
<th>Equation (DV)</th>
<th>Path</th>
<th>Predictor</th>
<th>B</th>
<th>SE B</th>
<th>Beta (β)</th>
<th>R²</th>
<th>ΔR²</th>
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<td>.19***</td>
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<td>.16*</td>
<td>.05</td>
<td>.05**</td>
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<td>-.05</td>
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<td>.01</td>
<td>-.13*</td>
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<td></td>
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<td>Academic Stress</td>
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<td>.03</td>
<td>.07</td>
<td>.20</td>
<td>.15***</td>
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<td>.01</td>
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<td>.02</td>
<td>-.43***</td>
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Note. * p < .05, ** p < .01, *** p < .001.

The overall model was statistically significant with 20% variance in external eating explained when resourcefulness skills entered into the relationship between process regulators and external eating (Table 4.29, Equation 4, path c’). There was a significant relationship between resourcefulness skills and external eating (β = -.43, p < .001). An additional 15% variance was explained by resourcefulness skills. A mediating effect of resourcefulness skills was found between two of the process regulators (academic stress and dispositional optimism) and external eating.

![Diagram](image)

*Figure 4.11. Mediating effect of resourcefulness skills between academic stress and external eating. c' = .07; c = .16*.  
* p < .05, ** p < .01, ***p < .001.*
Displayed in Table 4.29, the significant relationships between academic stress/dispositional optimism and external eating (Equation 3, path c) both became non-significant when resourcefulness skills were added into this model (Equation 4, path c’); in addition, the relationships were less strong (Beta, β) between academic stress and external eating (absolute values of Betas reduced from .16 to .07) and between dispositional optimism and external eating (absolute values of Betas reduced from .13 to .03). Hence, it was concluded that resourcefulness skills completely mediated the relationships between academic stress and dispositional optimism and external eating. The mediating effects of resourcefulness skills on the relationships between academic stress or dispositional optimism and external eating are shown in Figures 4.11 and 4.12, respectively.

![Figure 4.12. Mediating effect of resourcefulness skills between dispositional optimism and external eating. c’= .03; c = -.13*.](image)

* p < .05, ** p < .01, ***p < .001.

In summary, children with higher perceived academic stress had lower resourcefulness skills, which increased their tendency toward an external eating style. Meanwhile, children with a higher level of dispositional optimism also had higher resourcefulness skills, which decreased their tendency toward being an external eater. An overall model of relationships between process regulators (academic stress and dispositional optimism) and external eating is displayed in Figure 4.13.
Figure 4.13. Relationships among process regulators, children’s self-control behavior and external eating. † denotes significant relationships initially and became non-significant in the overall mediation models.

Table 4.30.

Mediating Effect of Resourcefulness Skills on Process Regulators and Restrained Eating

<table>
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<tr>
<th>Equation (DV)</th>
<th>Path</th>
<th>Predictor</th>
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<th>SE B</th>
<th>Beta (β)</th>
<th>( R^2 )</th>
<th>( ΔR^2 )</th>
</tr>
</thead>
<tbody>
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<td>.001</td>
<td>.001</td>
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<tr>
<td>3 (Restrained Eating)</td>
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<td>.04</td>
<td>.12</td>
<td>.03</td>
<td>.03</td>
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<td>-.03</td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dispositional Optimism</td>
<td>.03</td>
<td>.02</td>
<td>.15*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 (Restrained Eating)</td>
<td>c'</td>
<td>Academic Stress</td>
<td>.07</td>
<td>.04</td>
<td>.12</td>
<td>.03</td>
<td>.000</td>
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<td>.02</td>
<td>.15*</td>
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<td></td>
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Note. * p < .05, ** p < .01, ***p < .001.

Restrained eating. As presented in Table 4.30, resourcefulness skills were unrelated to restrained eating (\( β = .03, p > .05 \)) (Equation 2, path b). When resourcefulness skills were entered into the model, the overall model accounted for a non-significant proportion of the variance (3%) in restrained eating (Equation 4, path c’).

Because resourcefulness skills had no effect on restrained eating, according to the rules of determining mediation (Hayes, 2009; Kenny, 2012; MacKinnon et al., 2007; MacKinnon & Fairchild, 2009; Zhao et al., 2010), it was concluded that resourcefulness
skills could not have a mediating effect on the relationships between process regulators (academic stress and dispositional optimism) and restrained eating. That is, resourcefulness skills did not mediate the effects of process regulators on restrained eating in the study sample.

RQ #9. While controlling for covariates, how do process regulators (academic stress and dispositional optimism/pessimism) and self-control behavior (children’s resourcefulness skills) mediate intrinsic (children’s age, gender, BMI, satiety responsiveness, and hunger/satiety cues) and extrinsic (caregivers’ resourcefulness, dispositional optimism/pessimism, and eating styles – emotional, external, and restrained) contextual factors on target behavior (children’s eating styles – emotional, external, and restrained)?

A two-step multiple mediator model (Hayes, 2009) was applied to investigate the mediating effects of each pair of process regulator and self-control behavior (academic stress and resourcefulness skills, dispositional optimism and resourcefulness skills, and dispositional pessimism and resourcefulness skills) on the relationship between contextual factors and target behavior – children’s eating styles (Figure 4.14).

Figure 4.14. Mediating effects of process regulators and resourcefulness skills between contextual factors and eating styles.
A series of hierarchical multiple regressions were performed according to the approaches proposed by (Hayes, 2009), and included the following five regression equations: (1) regressing each progress regulator (i.e. academic stress, dispositional pessimism, and dispositional optimism) (DV) separately on the contextual factors (predictors) (first block) while controlling for covariates (second block) (Regression Equation 1; Figure 4.14, path a1), (2) regressing children’s resourcefulness skills (DV) on the process regulators (Regression Equation 2; Figure 4.14, path a2), (3) regressing each individual eating styles separately (i.e. emotional, external, and restrained) (DV) on children’s resourcefulness skills (Regression Equation 3; Figure 4.14, path b1), and (4) regressing each individual eating styles (DV) separately on the contextual factors (predictors) (first block) while controlling for covariates (second block) (Regression Equation 4; Figure 4.14, path c).

The last equation – to test mediation – was to regress each individual eating style (DV) separately on the contextual factors (first block), each process regulators separately (third block), and children’s resourcefulness skills (fourth block) while controlling the covariates (second block) (Regression Equation 5; Figure 4.14, path c’). For example, when examining the mediating effects of academic stress and resourcefulness on the relationship between contextual factors and emotional eating while controlling the covariates, the final equation (testing mediation) would include DV (emotional eating) and predictors (IVs) such as contextual factors (first block), academic stress (third block), and resourcefulness skills (fourth block) while controlling for covariates (second block). Another example of regression equation, examining the mediating effects of dispositional optimism and resourcefulness on the relationship between contextual factors and external
eating while controlling for covariates, included DV (external eating) and predictors (IVs) such as contextual factors (first block), dispositional optimism (third block), and resourcefulness skills (fourth block) while controlling for covariates (second block).

Since a significant relationship between the predictor and DV is not crucial when examining mediation (Hayes, 2009; Kenny, 2012; MacKinnon et al., 2007; MacKinnon & Fairchild, 2009; Zhao et al., 2010), the mediating effects of each pair of process regulators and resourcefulness skills can be determined by comparing the standardized coefficients (Betas, βs) of Equations 4 and 5 (See Figure 4.14, paths c and c’) and having a decreased Beta (β) of Equation 5 (path c’) if the following conditions were met. These crucial criteria include: (1) if there are significant direct effects of contextual factors on each of process regulators (See Figure 4.14, path a1), (2) if there are significant direct effects of process regulators on children’s resourcefulness skills (See Figure 4.14, path a2), and (3) if there are significant direct effects of resourcefulness skills on each eating style (See Figure 4.14, path b1).

However, it was found that dispositional pessimism (process regulator) did not have a direct effect on resourcefulness skills according to previous discussions (See Table 4.25, Equation 2). The criteria for determining mediation (as described above) were not met. Hence, there was no need to test the mediation of dispositional pessimism and resourcefulness skills as a pair of mediators on the relationship between contextual factors and eating styles. The results of the sequence of regression equations are described by each of the three individual eating styles in the following sections.
**Emotional eating.** Mediating effects of each pair of process regulators and resourcefulness on the relationships between contextual factors and emotional eating were examined through a series of hierarchical regressions.

Table 4.31.

<table>
<thead>
<tr>
<th>Equation (DV)</th>
<th>Path</th>
<th>Predictor</th>
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<th>SE</th>
<th>Beta (β)</th>
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Table 4.31.

**Mediating Effects of Academic Stress and Resourcefulness Skills on Contextual Factors and Emotional Eating (cont’d)**

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<th>Path (Test of Mediation)</th>
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Note. a = satiety responsiveness rated by the caregiver. b = caregivers’ variables. c = control variables included children’s school performance, chronic condition, medication, and caregivers’ age, gender, BMI, education, and family income. * p < .05, ** p < .01, ***p < .001.

**Academic stress and resourcefulness skills as mediators.** As showed in Table 4.31, children’s satiety responsiveness (β = .23, p < .01) and caregivers’ emotional eating (β = -.19, p < .05) were the two variables among contextual factors that had direct effects on academic stress (Equation 1, path a1). Academic stress was also found to have a negative direct effect on resourcefulness skills (β = -.26, p < .001) (Equation 2, path a2); in addition, resourcefulness skills had a direct effect on emotional eating (β = -.16, p < .05) (Equation 3, path b1). Meanwhile, children’s satiety responsiveness (β = -.02, p > .05) and caregivers’ emotional eating (β = -.01, p > .05) had no direct effects on emotional eating (Equation 4, path c). Hence, there were contextual factors that had
direct effects on academic stress, and academic stress had a direct effect on resourcefulness in this two-step multiple mediator model.

Since a significant relationship between predictors and DV is not required when examining mediation, and therefore the essential conditions for determining mediation were met (Hayes, 2009; Kenny, 2012; MacKinnon et al., 2007; MacKinnon & Fairchild, 2009; Zhao et al., 2010), the analysis of the mediating effects of academic stress and resourcefulness skills was performed. When academic stress and resourcefulness skills were entered into the model to examine the mediating effects on the relationships between contextual factors and emotional eating (Table 4.31, Equation 5, path c’), the overall model was statistically significant with 13% variance in children’s emotional eating explained. An additional 2% variance was explained by resourcefulness skills. Additionally, based on the path analytic approach, it should be noted that the relationship between academic stress and emotional eating was also tested and found to be non-significant in this overall mediation model.

![Diagram](image)

*Figure 4.15. Mediating effects of academic stress and resourcefulness skills between satiety responsiveness and emotional eating style.

* p < .05, ** p < .01, ***p < .001.

Both satiety responsiveness and caregivers’ emotional eating had no significant direct effects on children’s emotional eating in the overall model. The relationships were
observed to become slightly stronger between satiety responsiveness and children’s emotional eating (absolute values of Betas from .02 to .09) as well as between caregivers’ emotional eating and children’s emotional eating (absolute values of Betas from .01 to .02). The overall relationships among these variables are shown in Figures 4.15 and 4.16.

As presented in Figure 4.15, no direct effect existed between satiety responsiveness and emotional eating. The relationship between satiety responsiveness and emotional eating was improved when academic stress and resourcefulness skills were added to the regression. Children with a **stronger satiety** response (smaller appetite) had a **higher** perceived academic stress and **lower** resourcefulness skills. **Lower resourcefulness** was associated with a **higher** tendency toward the emotional eating style.

![Diagram](https://example.com/diagram.png)

*Figure 4.16. Mediating effects of academic stress and resourcefulness skills between caregivers’ emotional eating and emotional eating style.*

* *p < .05, ** *p < .01, *** *p < .001.

Likewise, no direct effect was found between caregivers’ and children’s emotional eating in the overall mediation model. The relationship between caregivers’ and children’s emotional eating was slightly improved when both academic stress and resourcefulness skills were entered into the regression (See Figure 4.16). That is, **higher** emotional eating behavior in caregivers was associated with **lower** academic stress in the
children and **higher** resourcefulness skills. As a result, the children had a **lower** tendency toward emotional eating.

**Dispositional optimism and resourcefulness skills as mediators.** According to Table 4.32, children’s hunger and satiety cues were found to have a **direct** effect on dispositional optimism ($\beta = .26$, $p < .001$) in the model examining the predictors of dispositional optimism (Equation 1, path a1) while controlling for covariates.

Dispositional optimism had a positive **direct** effect on resourcefulness skills ($\beta = .40$, $p < .001$) (Equation 2, path a2), and resourcefulness skills had a negative **direct** effect on emotional eating ($\beta = -.16$, $p < .05$) (Equation 3, path b1). Meanwhile, children’s hunger and satiety cues did **not** predict emotional eating ($\beta = -.04$, $p > .05$) (Equation 4, path c).

Table 4.32.

**Mediating Effects of Dispositional Optimism and Resourcefulness Skills on Contextual Factors and Emotional Eating**

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237
Table 4.32.

**Mediating Effects of Dispositional Optimism and Resourcefulness Skills on Contextual Factors and Emotional Eating (cont’d)**

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<td>.01</td>
<td>.15*</td>
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</table>

5  
| (Emotional Eating) | c' | (Test of Mediation) | Intrinsic Factors | Age | -.39 | .28 | -.09 |
|                     |    |                     | Gender | .67 | .32 | .14* |
|                     |    |                     | BMI z-score | .003 | .14 | .001 |
|                     |    |                     | Satiety Responsiveness | -.04 | .05 | -.07 |
|                     |    |                     | Satiety Responsiveness | -.001 | .05 | -.001 |
|                     |    |                     | **Hunger/Satiety Cues** | **-.03** | **.04** | **-.05** |
|                     |    | Extrinsic Factors | Resourcefulness Skills | .01 | .01 | .08 |
|                     |    |                     | Dispositional Pessimism | -.01 | .09 | -.01 |
|                     |    |                     | Emotional Eating | -.002 | .02 | -.01 |
|                     |    |                     | External Eating | .01 | .04 | .02 |
|                     |    |                     | Restrained Eating | -.06 | .03 | -.17* |
|                     |    | Control Variables | Dispositional Optimism | .03 | .01 | .15* |
|                     |    |                     | **Resourcefulness Skills** | **-.08** | **.02** | **-.25** |

Note. a = satiety responsiveness rated by the caregiver. b = caregivers’ variables. c = control variables included children’s school performance, chronic condition, medication, and caregivers’ age, gender, BMI, education, and family income.

* p < .05, ** p < .01, ***p < .001.

When dispositional optimism and resourcefulness were added into the model to test the mediating effects on the relationships between contextual factors and emotional eating, the overall regression model was statistically significant with 13% of the variance.
in children’s emotional eating explained (See Table 4.32, Equation 5). An additional 5% variance was explained by resourcefulness skills. Additionally, using path analysis, the relationship between dispositional optimism and emotional eating was found to be significant.

![Diagram](image)

*Figure 4.17. Mediating effects of dispositional optimism and resourcefulness skills between hunger/satiety cues and emotional eating style. † denotes a significant relationship in this overall mediation model.
* *p < .05, **p < .01, ***p < .001.*

Children’s awareness of internal hunger and satiety cues continued to have no direct effect on emotional eating in the overall model (See Table 4.32, Equation 5, path c’). As shown in Table 4.32, although the differences between the coefficients were very small when comparing Equations 4 and 5 (paths c and c’), it was concluded that children’s hunger/satiety cues did not have a direct effect on emotional eating, but did have an *indirect* effect on emotional eating through dispositional optimism and resourcefulness skills (Figure 4.17). That is, in this child sample, children’s *higher* hunger/satiety cues (more positive eating style) contributed to *higher* dispositional optimism, which then predicted *higher* resourcefulness skills; as a result, *higher* resourcefulness skills were associated with a *lower* tendency toward emotional eating.
Figure 4.18. Relationships between contextual factors and emotional eating. † denotes non-significant relationships presented before and after mediation. ‡ denotes a significant relationship presented before mediation and a non-significant relationship after mediation. †† denotes a non-significant relationship before mediation and a significant relationship after mediation.
In summary, when academic stress and resourcefulness skills were entered into the regression, the relationships between children’s satiety responsiveness (an appetite trait) and children’s emotional eating and between caregivers’ emotional eating and children’s emotional eating were slightly improved. Likewise, the relationship between children’s hunger/satiety cues (a dimension of intuitive eating – positive eating) and emotional eating was improved slightly when dispositional optimism and resourcefulness skills were added into the regression. Therefore, academic stress and resourcefulness skills as well as dispositional optimism and resourcefulness helped to explain the relationships between the variables as described above. The overall relationship among the variables described above is presented in Figure 4.18.

**External eating.** Similar hierarchical regression procedures as those described above were applied to examine the mediating effects of each pair of process regulators and resourcefulness on the relationships between contextual factors and external eating. The results are described in the following sections.

**Academic stress and resourcefulness skills as mediators.** As showed in Table 4.33, among contextual factors, only children’s satiety responsiveness ($\beta = .23, p < .01$) and caregivers’ emotional eating ($\beta = -.19, p < .05$) had direct effects on academic stress (Equation 1, path a1); in addition, academic stress was found to have a direct effect on resourcefulness skills ($\beta = -.26, p < .001$) (Equation 2, path a2). Furthermore, resourcefulness skills had a negative direct effect on external eating ($\beta = -.44, p < .001$) (Equation 3, path b1).
Table 4.33.

*Mediating Effects of Academic Stress and Resourcefulness Skills on Contextual Factors and External Eating*

<table>
<thead>
<tr>
<th>Equation (DV)</th>
<th>Path</th>
<th>Predictor</th>
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<th>SE B</th>
<th>Beta (β)</th>
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Table 4.33.

**Mediating Effects of Academic Stress and Resourcefulness Skills on Contextual Factors and External Eating (cont’d)**

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*Note. a = satiety responsiveness rated by the caregiver. b = caregivers’ variables. c = control variables included children’s school performance, chronic condition, medication, and caregivers’ age, gender, BMI, education, and family income.

* p < .05, ** p < .01, ***p < .001.

Although children’s satiety responsiveness and caregivers’ emotional eating did not contribute to children’s external eating (See Table 4.33, Equation 4, path c), the essential requirements for determining mediating effects (Hayes, 2009; Kenny, 2012; MacKinnon et al., 2007; MacKinnon & Fairchild, 2009; Zhao et al., 2010) of academic stress and resourcefulness skills on the relationship between contextual factors and external eating were met. Hence, the next step was to examine the mediating effects of academic stress and resourcefulness skills.

In order to examine the mediating effects of academic stress and resourcefulness skills on the relationships between contextual factors and external eating while controlling for covariates, academic stress and resourcefulness skills were added.
sequentially into the model testing the effects of contextual factors on external eating (Table 4.33, Equation 5, path c'). The overall two-step multiple mediator model was statistically significant with 29% of the variance in children’s external eating explained. An additional 19% of the variance was explained by resourcefulness skills ($\beta = -0.50, p < 0.001$). In addition, using path analysis, the relationship between academic stress and external eating was also found to be non-significant in the overall model.

![Diagram](image)

*Figure 4.19. Mediation effects of academic stress and resourcefulness skills between satiety responsiveness and external eating. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$. 

As presented in Table 4.33 (Equations 4 and 5, paths c and c’) as well as Figures 4.19 and 4.20, there were changes in the relationships between satiety responsiveness and external eating (absolute values of Betas improved from .04 to .15). The relationship between caregivers’ emotional eating and children’s external eating had slightly changes (absolute values of Betas changed from .02 to .03) after adding academic stress and resourcefulness skills in the model. Hence, it was determined that academic stress and resourcefulness skills played a role in further explaining the relationships between satiety responsiveness and external eating and between caregivers’ emotional eating and children’s external eating.
In conclusion, as shown in Figure 4.19, children who had higher satiety responsiveness (smaller appetite) tended to have higher perceived academic stress. This led to lower resourcefulness skills; as a result, lower resourcefulness contributed to higher tendency toward external eating. Likewise, caregivers’ emotional eating did not have a direct effect on children’s external eating, but it did have an indirect effect on external eating through academic stress and resourcefulness skills (Figure 4.20).

![Mediating effects of academic stress and resourcefulness skills between caregivers’ emotional eating and children’s external eating.](image)

*Figure 4.20. Mediating effects of academic stress and resourcefulness skills between caregivers’ emotional eating and children’s external eating.*

* p < .05, ** p < .01, *** p < .001.

**Dispositional optimism and resourcefulness skills as mediators.** While controlling for covariates, children’s hunger/satiety cues was the only predictor of dispositional optimism (β = .26, p < .001) among contextual factors (Table 4.34, Equation 1, path a1). Children’s hunger/satiety cues did not have direct influence on external eating (β = -.03, p > .05) (Equation 4, path c). Therefore, it was concluded that children’s hunger/satiety cues did not have a direct effect on external eating.

According to Table 4.34, dispositional optimism had a direct effect on resourcefulness skills (β = .40, p < .001) (Equation 2, path a2) and resourcefulness skills had a direct effect on external eating (β = -.44, p < .001) (Equation 3, path b1). Based on the suggestions by certain scholars (Hayes, 2009; Kenny, 2012; MacKinnon et al., 2007;
MacKinnon & Fairchild, 2009; Zhao et al., 2010) indicating that a significant relationship between predictors and DV is not mandatory when examining mediation. Therefore, the criteria for determining mediation were met and the next step was to examine the mediating effects of dispositional optimism and resourcefulness skills on the relationships between contextual factors and external eating.

Table 4.34.

**Mediating Effects of Dispositional Optimism and Resourcefulness Skills on Contextual Factors and External Eating**

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Table 4.34.

**Mediating Effects of Dispositional Optimism and Resourcefulness Skills on Contextual Factors and External Eating (cont’d)**

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*Note. a = satiety responsiveness rated by the caregiver. b = caregivers’ variables. c = control variables included children’s school performance, chronic condition, medication, and caregivers’ age, gender, BMI, education, and family income. * $p < .05$, ** $p < .01$, *** $p < .001$. To evaluate if dispositional optimism and resourcefulness skills played a mediating role in the relationship between contextual factors and external eating, dispositional optimism and resourcefulness skills were added to the model. As seen in Table 4.34 (Equation 5, path c’), the overall two-step multiple mediator model was statistically significant with 29% of the variance in children’s external eating explained. An additional 19% of the variance was explained by resourcefulness skills. Additionally,
it was found that dispositional optimism and external eating were not associated in the overall model. The standardized coefficient (Beta) of hunger/satiety cues barely changed (absolute values of Betas changed from .03 to .01) after dispositional optimism and resourcefulness skills were added to the model.

**Figure 4.21.** Mediating effects of dispositional optimism and resourcefulness skills between hunger/satiety cues and external eating style.

* *p* < .05, ** *p* < .01, *** *p* < .001.

Children’s hunger and satiety cues had **no direct** effect on external eating; therefore, taken together, dispositional optimism and resourcefulness skills provided information on why and how hunger/satiety cues influenced external eating. The mediating effect of dispositional optimism and resourcefulness on the relationship between children’s hunger/satiety cues and external eating is displayed in Figure 4.21. Children with **higher** hunger/satiety cues (more intuitive eating/more positive eating) had **higher** dispositional optimism, which contributed to a **higher** resourcefulness skills and a **lower** tendency toward external eating.

To sum up, similar to the previous discussion, the mediating effects of academic stress and resourcefulness skills as well as dispositional optimism and resourcefulness skills on the relationship between contextual factors and external eating were examined. In the two-step multiple mediator model, academic stress and resourcefulness skills were
tested as mediators to uncover the relationship between children’s satiety responsiveness and external eating and between caregivers’ emotional eating and children’s external eating. Likewise, children’s hunger/satiety cues had an indirect effect on external eating through dispositional optimism and resourcefulness skills. The overall model that describes the relationships between contextual factors and external eating through academic stress/dispositional optimism and resourcefulness skills is displayed in Figure 4.22.
Figure 4.22. Relationships between contextual factors and external eating. † denotes a non-significant relationship existed initially but became a significant relationship in the overall mediation model. ‡ denotes a significant relationship before mediation and a non-significant relationship existed in the overall mediation model. †† denotes non-significant relationships before and after mediation.
Table 4.35.

**Mediating Effects of Academic Stress and Resourcefulness Skills on Contextual Factors and Restrained Eating**

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<td>.01</td>
<td>.02</td>
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<tr>
<td></td>
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<td>.10</td>
<td>-.02</td>
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<tr>
<td></td>
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<td>.03</td>
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<td>.05</td>
<td>.19*</td>
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<tr>
<td></td>
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<td>Restrained Eating</td>
<td>-.03</td>
<td>.03</td>
<td>-.07</td>
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</tr>
</tbody>
</table>

*Note. a = satiety responsiveness rated by the caregiver. b = caregivers’ variables. c = control variables included children’s school performance, chronic condition, medication, and caregivers’ age, gender, BMI, education, and family income.

* p < .05, ** p < .01, ***p < .001.
**Restrained eating.** Like previous discussions on dependent variables such as emotional and external eating, a series of hierarchical regressions were performed to examine the mediating effects of each pair of process regulators and resourcefulness on the relationship between contextual factors and restrained eating. The mediating effects of individual process regulators and resourcefulness skills (i.e. academic stress and resourcefulness skills) on the relationship between contextual factors and restrained eating are discussed in the following sections.

**Academic stress and resourcefulness skills as mediators.** As displayed in Table 4.35, children’s satiety responsiveness and caregivers’ emotional eating were predictors of academic stress (Equation 1, path a1) and academic stress was a predictor of resourcefulness skills (Equation 2, path a2). However, resourcefulness skills had no effect on restrained eating ($\beta = .03, p > .05$) (Equation 3, path b1). According to the criteria suggested by scholars for determining mediation (Hayes, 2009; Kenny, 2012; MacKinnon et al., 2007; MacKinnon & Fairchild, 2009; Zhao et al., 2010), there was not enough evidence to support the mediating roles played by academic stress and resourcefulness skills. Therefore, the putative mediating effects produced by academic stress and resourcefulness skills in a two-step multiple mediator model was unable to be determined. In other words, the relationship between contextual factors and restrained eating was not found to be mediated by academic stress and resourcefulness skills.

**Dispositional optimism and resourcefulness skills as mediators.** As presented in Table 4.36, similar to what was previously discussed, resourcefulness skills had no effect on restrained eating ($\beta = .03, p > .05$) (Equation 3, path b1) although dispositional optimism had a direct effect on resourcefulness skills (Equation 2, path a2). Therefore,
the putative mediating effects produced by dispositional optimism and resourcefulness skills in a two-step multiple mediator model was unable to be determined. That is, the relationships between contextual factors and restrained eating were not found to be mediated by dispositional optimism and resourcefulness skills.

Table 4.36.

**Mediating Effects of Dispositional Optimism and Resourcefulness Skills on Contextual Factors and Restrained Eating**

<table>
<thead>
<tr>
<th>Equation (DV)</th>
<th>Path</th>
<th>Predictor</th>
<th>B</th>
<th>SE B</th>
<th>Beta (β)</th>
<th>R²</th>
<th>ΔR²</th>
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<tbody>
<tr>
<td>1</td>
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</tr>
<tr>
<td></td>
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<td>.01</td>
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<tr>
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<td>.24</td>
<td>-.07</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Satiety Responsiveness</td>
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<td>.26</td>
<td>.05</td>
<td></td>
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<tr>
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<td><strong>Hunger/Satiety Cues</strong></td>
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<td>.26***</td>
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<td></td>
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<td>Restrained Eating</td>
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<td>.13</td>
<td>-.07</td>
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<td></td>
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<tr>
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<td>.16</td>
<td>.16***</td>
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<td>.03</td>
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</tr>
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<td>4</td>
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<td>.31</td>
<td>.05</td>
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<td>.16*</td>
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<td>.42***</td>
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<td>.05</td>
<td>.31***</td>
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<td>-.01</td>
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<td>.04</td>
<td>.04</td>
<td>.06</td>
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</table>

253
Table 4.36.

Mediating Effects of Dispositional Optimism and Resourcefulness Skills on Contextual Factors and Restrained Eating (cont’d)

<table>
<thead>
<tr>
<th>Equation (DV)</th>
<th>Path</th>
<th>Predictor</th>
<th>B</th>
<th>SE B</th>
<th>Beta (β)</th>
<th>R²</th>
<th>ΔR²</th>
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<tbody>
<tr>
<td>4 (Restrained Eating)</td>
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<td>Extrinsic Factors^b</td>
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<td></td>
<td>Resourcefulness Skills</td>
<td>.003</td>
<td>.01</td>
<td>.02</td>
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<tr>
<td></td>
<td></td>
<td>Dispositional Pessimism</td>
<td>-.04</td>
<td>.10</td>
<td>-.02</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Emotional Eating</td>
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<td>.03</td>
<td>-.11</td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>External Eating</td>
<td>.13</td>
<td>.05</td>
<td>.19*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Restrainted Eating</td>
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<td>.03</td>
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</tr>
<tr>
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<td></td>
<td>Control Variables^c</td>
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<td></td>
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</tr>
</tbody>
</table>

Note. a = rated by the caregiver. b = caregivers’ variables. c = control variables included children’s school performance, chronic condition, medication, and caregivers’ age, gender, BMI, education, and family income.

* p < .05, ** p < .01, ***p < .001.

In summary, when examining the mediating effects of each pair of process regulators and children’s resourcefulness skills on the relationship between contextual factors and eating styles, academic stress and resourcefulness skills mediated the relationship between children’s satiety responsiveness and emotional eating and between caregivers’ emotional eating and children’s emotional eating. In addition, dispositional optimism and resourcefulness skills were found to mediate hunger/satiety cues on emotional eating. Likewise, academic stress and resourcefulness skills had mediating effects on the relationships between children’s satiety responsiveness and external eating and between caregivers’ emotional eating and children’s external eating. Furthermore, the relationship between children’s hunger/satiety cues and external eating was mediated by dispositional optimism and resourcefulness skills. As for restrained eating, no mediating effects by the process regulators or resourcefulness skills were found on the relationship between the contextual factors and restrained eating.
**Additional Analysis**

**Process Regulators as Mediators on the Relationship between Contextual Factors and Children’s Self-Control Behavior (Resourcefulness Skills).**

There were three process regulators -- academic stress, dispositional pessimism, and dispositional optimism -- in the proposed single-step multiple mediator model (Figure 4.23). A simultaneous regression of children’s resourcefulness (DV) on the contextual factors (predictors) and the three process regulators together was performed to examine the overall mediating effect of process regulators. These mediators were examined simultaneously because each mediator was uniquely related to children’s resourcefulness skills (DV) while controlling for other mediators and contextual factors (predictors). In order to examine an overall mediating effect of the process regulators, similar procedures were processed as described above.

![Figure 4.23. A proposed single-step tri-mediation model.](image)

As presented in Table 4.37 (Equation 2, path b), **not** all process regulators were associated with resourcefulness skills. Dispositional pessimism did **not** have a direct effect on resourcefulness skills (β = .01, \( p > .05 \)). Since only two of the three mediators were significantly associated with the children’s resourcefulness, βs = -.21 (\( p < .01 \)) and .37 (\( p < .001 \)) for academic stress and dispositional optimism, respectively; hence, a
dual-mediation model rather than a tri-mediation model could have been supported if the same variables from contextual factors significantly predicted these mediators simultaneously.

Table 4.37.

**Mediating Effect of Process Regulators on Contextual Factors and Resourcefulness Skills**

<table>
<thead>
<tr>
<th>Equation (DV)</th>
<th>Path</th>
<th>Predictor</th>
<th>B</th>
<th>SE B</th>
<th>Beta (β)</th>
<th>$R^2$</th>
<th>$\Delta R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>b</td>
<td>Academic Stress</td>
<td>-.29</td>
<td>.08</td>
<td>-.21**</td>
<td>.20</td>
<td>.20***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dispositional Pessimism</td>
<td>.03</td>
<td>.21</td>
<td>.01</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Dispositional Optimism</td>
<td>.22</td>
<td>.04</td>
<td>.37***</td>
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</table>

*Note.* *p* < .05, **p** < .01, ***p*** < .001.

In addition, as depicted in Tables 4.24 through 4.26 (Equation 1, path a), children’s satiety responsiveness and caregivers’ emotional eating predicted children’s academic stress, caregivers’ perspective of children’s satiety responsiveness predicted dispositional pessimism, and hunger/satiety cues predicted dispositional optimism, it was concluded that variables that predicted each process regulator were different and no variables predicted these process regulators simultaneously. As a result, the mediating effect of process regulators between contextual factors and resourcefulness skills was not supported. However, it could have supported a dual-mediation model, indicating each one of the mediators was uniquely associated with resourcefulness skills if there were variables found to have direct effects on these process regulators at the same time.

**Summary of the Findings**

In this chapter, nine research questions were addressed, clarified, and explained by using statistical methods, which included dependent-samples tests, Pearson product-
moment correlation coefficients, and hierarchical multiple regression. Findings are summarized in the following sections.

**Demographic Information**

Of the 368 fifth and sixth graders, the average age was 11.61 years (SD = .56). The mean BMI was 19.13 (SD = 3.76). On average, boys had a higher height, weight, and BMI level than girls. According to the childhood overweight criteria (CDC, 2011; Chen et al., 2003; Food and Drug Administration, Department of Health, Executive Yuan, Republic of China [Taiwan], 2010), 26.24% of the children studied were overweight or obese. Additionally, boys had a higher prevalence of overweight or obese than girls (boys: 60.00%; girls: 40.00%), and girls had a higher prevalence of underweight than boys (boys: 40.63%; girls: 59.38%).

Of the 368 caregiver participants, the age range was 20 to 76 with an average of 40.87 years (SD = 5.42). The average BMI level was 22.74 (SD = 3.17), and 18.21% were overweight and 11.41% obese.

**Inter-correlations among Contextual factors, Process Regulators, Self-Control Behavior, and Eating Styles (RQs #1 through #6)**

When examining the associations between contextual factors and process regulators (academic stress, dispositional pessimism, and dispositional optimism), none of these contextual factors had relationships with dispositional pessimism. Children’s BMI z-score, satiety responsiveness, school performance, caregivers’ education level, and family income had weak relationships with academic stress. In other words, higher children’s academic stress was correlated with higher children’s BMI z-score, satiety responsiveness, lower school performance, caregivers’ education, and family income.
Meanwhile, children’s satiety responsiveness, hunger/satiety cues, school performance, caregivers’ resourcefulness, and family income had weak to moderate correlations with children’s dispositional optimism. That is, higher children’s dispositional optimism was significantly related to lower satiety responses, higher awareness of internal hunger/satiety cues, better school performance, higher caregivers’ resourcefulness skills, and better family income.

Few weak correlations were found when investigating the relationships between contextual factors and resourcefulness skills among child participants. More resourceful children were found to be female and to be more sensitive to internal hunger/satiety cues. They were also found to have lower responses to satiety. However, resourcefulness skills between caregiver-child dyads were not related. Additionally, children’s resourcefulness skills had no relationship with their age, BMI, school performance, or their family income.

When evaluating the correlations between contextual factors and eating styles, children’s emotional eating was related to their school performance and caregivers’ restrained eating. Children’s restrained eating was associated with higher children’s BMI, higher satiety responsiveness, higher caregiver BMI, and higher caregiver restrained eating. Among these correlations, most of the relationships were low in strength except the relationship between children’s BMI; restrained eating, which was moderately strong.

Among the relationships of process regulators (academic stress, dispositional pessimism, and dispositional optimism), resourcefulness skills, and eating styles, children with a higher tendency toward emotional eating had higher academic stress and lower resourcefulness skills. Children with a higher tendency toward external eating had higher
academic stress, lower dispositional optimism, and lower resourcefulness skills. Meanwhile, children’s restrained eating was not associated with dispositional pessimism or resourcefulness skills, but it was associated with higher academic stress and higher dispositional optimism.

**The Mediating Role of Each Process Regulators (Academic Stress, Dispositional Pessimism, and Dispositional Optimism) (RQ #7)**

When examining the mediating effect of each process regulator independently after controlling for covariates, academic stress mediated the relationship between children’s satiety responsiveness and resourcefulness skills. In addition, caregivers’ emotional eating had no direct effect but had an indirect effect on children’s resourcefulness skills through academic stress. Likewise, children’s hunger/satiety cues had no direct effect but had an indirect effect on children’s resourcefulness skills through dispositional optimism.

**The Mediating Role of Self-Control Behavior (RQ #8)**

Children’s resourcefulness skills mediated the relationships between academic stress and two eating styles – emotional and external eating. Additionally, dispositional optimism had no direct effect but had an indirect effect on emotional eating through resourcefulness skills. Lastly, no mediating effect by resourcefulness skills was found on the relationships between academic stress/dispositional optimism and restrained eating.

**The Mediating Roles of Process Regulators and Self-Control Behavior (RQ #9)**

When examining the mediating effects of each pair of process regulators and self-control behavior (children’s resourcefulness skills) on the relationships between contextual factors and the three eating styles while controlling for the covariates,
contextual factors had no direct effect on eating styles (emotional and external eating) but had an indirect effect through two pairs of process regulators – resourcefulness skills (academic stress – resourcefulness skills and dispositional optimism – resourcefulness skills). That is, satiety responsiveness had no direct effect on emotional and external eating styles but had an indirect effect through academic stress and resourcefulness skills. Children’s hunger/satiety cues had no direct effect but had an indirect effect on emotional and external eating styles through dispositional optimism and resourcefulness skills.
CHAPTER 5: DISCUSSION AND RECOMMENDATIONS

Introduction

This chapter provides a discussion of research findings in light of the theoretical and empirical literature. In addition, the limitations of the study related to methodological issues are addressed. Implications and recommendations for clinical practices, theory development, health policy, nursing education, and future research are also delineated. Finally, plans for dissemination and secondary analysis are addressed.

Discussion of the Findings

The discussion of the study’s findings is organized by the characteristics of participants and research questions.

Characteristics of Participants

Child participants. Among the child participants in the study, 26.24% of the fifth and sixth graders were overweight or obese. This prevalence rate is similar to the national survey of elementary school children in the period from 2001 through 2002 (Chu & Pan, 2007) as well as the national survey of weight status in elementary school children for the year 2011 (Department of Statistics, Ministry of Education, Republic of China [Taiwan], 2012). Both surveys conducted in Taiwan reported that about 25% to 30% of school-age children were overweight and obese. This figure is also lower than for children aged 6-11 (33%) in the US (Ogden et al., 2012). Additionally, congruent with the national surveys, the prevalence of overweight and obesity were both higher in boys.

Health conditions that are related to overweight and obesity as indicated in the literature, such as hypertension, diabetes, or depression, were not observed in the current sample. Asthma (36.1%) was the most reported chronic condition by the child
participants. In addition, the children’s chronic conditions were not related to significant differences in the BMI scores in general.

Studies have shown that better school performance was linked to a lower level of children’s weight (Mo-Suwan et al., 1999; Tershakovec et al., 1994) and BMI (Castelli, Hillman, Buck, & Erwin, 2007; Shore et al., 2008). In the current study, although the children’s overall academic achievement was not related to their body weight, academic achievement was negatively correlated with BMI, which indicates that better overall academic performance was linked to lower BMI.

**Caregiver participants.** According to the Nutrition and Health Survey in Taiwan (NAHSIT) 2005-2008 (NAHSIT, 2009), the prevalence of adult overweight or obesity is 44.1%, and the average adult BMI is 23.2 for females and 24.2 for males. In the current study, 29.6% of the caregiver participants were overweight or obese, which is much lower than the national survey. Additionally, their average BMIs were 22.37 for females and 24.29 for males; that is, when compared to the BMI levels from the national survey, the female participants’ average BMI level was lower than the national survey and male participants’ average BMI level was slightly higher than the national survey.

The relationships among caregiver participants’ BMI levels and other demographic characteristics were also examined. The caregivers’ BMI levels were not associated with their education levels or family income. As existing complex patterns of the association between obesity/overweight and socioeconomic status (SES) are described in the literature, studies of the relationships between BMI and SES indicators, such as income and education, have had mixed results. For example, the relationship between SES and obesity is positive in lower-income contexts and inverse in higher-
income contexts among U.S. adults (Zhang & Wang, 2012), whereas no significant relationship between SES and overweight was found in a sample of Norwegian young adults (Friestad, Pirkis, Biehl, & Irwin, 2003) or in Pacific Islanders or Asians in New Zealand (Dryson, Metcalf, Baker, & Scragg, 1992). Furthermore, according to the analysis reported by Zhang and Wang (2012), the association between SES and obesity has decreased over time in the U.S., and the association between female BMI and SES changed from being significant in the 1970s to being insignificant from 1999 to 2000. Hence, the results of the current study and literature indicates that the individual socioeconomic characteristics, such as education level and income, may not be the main factors contributing to a higher BMI level, and other factors will need to be explored.

**Caregiver-child dyads.** Research has shown that parents’ BMI are strongly related to their children’s weight or BMI levels (Francis, Ventura, Marini, & Birch, 2007; Johannsen, Johannsen, & Specker, 2006; Lazzeri, Pammolli, Pilato, & Giacchi, 2011; Whitaker, Jarvis, Beeken, Boniface, & Wardle, 2010). Findings in the current sample are consistent with the existing literature in that the caregiver’s and child’s BMI scores had a moderate, positive correlation; that is, children are more likely to have a higher BMI if their caregivers have higher BMIs when compared to their counterparts.

As discussed previously, caregivers’ BMI levels were not associated with their education levels or family income; however, a statistically significant inverse correlation was found between the children’s BMIs and the caregivers’ education levels as well as family income, which is consistent with the findings reported in the literature (e.g., Knai, Lobstein, Darmon, Rutter, & McKee, 2012; Lazzeri et al., 2011; Morgenstern, Sargent, & Hanewinkel, 2009). In other words, the children with higher BMI levels were more likely
to grow up in socioeconomically deprived backgrounds. However, similar to the discordant results on the association of adult BMI and SES that was described previously, scholars also stated that children’s BMI and SES were not associated (e.g., Brunt, Lester, Davies, & Williams, 2008; Castelli et al., 2007). Despite the complicated relationship between BMI and SES, exposure to disadvantaged circumstances in childhood may still play an important role in later adulthood outcomes such as body weight and weight gain.

Children’s eating styles were the outcome variables in the current study. Caregivers’ eating styles were also examined. The three different eating styles were emotional, external, and restrained. Emotional eating indicates that eating is in response to stress or negative emotions, external eating refers to eating in response to external stimuli, and restraint eating reflects eating less than desired in order to maintain or lose weight (Van Strien et al., 1986). Consistent with the study conducted by Van Strien and Bazelier (2007) in a group of normal and overweight children 7-12 years old, it was found that external eating was the most prevalent style, followed by restrained and emotional eating styles in child participants. Meanwhile, in caregivers, the most prevalent eating style was restrained eating and followed by external and emotional eating styles.

**Interrelationships among eating styles.** The inter-correlations among children’s and caregivers’ eating styles were also examined. Findings in the children and caregivers were consistent with the existing pediatric and adult literature (Elfhag & Morey, 2008; Jasinska et al., 2012; Van Strien & Bazelier, 2007; Van Strien et al., 1986; Van Strien et al., 1995) in that the emotional and external eating styles were positively correlated with each other. More specifically, for the current study’s child participants, emotional and external eating styles had a moderate, positive correlation, whereas the correlation
between emotional and external eating was strong and positive among the caregiver participants.

Additionally, while Elfhag and Morey (2008) found that restrained eating was negatively related to emotional and external eating in obese adults in Sweden, Van Strien and associates (1986) found that restrained eating was positively correlated with both emotional and external eating in a study that combined obese and non-obese adults. However, other studies have found that restrained eating had no relationship with emotional or external eating styles in children and adolescents (Ledoux, Watson, Baranowski, Tepper, & Branaowski, 2011; Van Strien & Oosterveld, 2008). The findings from the current study are consistent with a study of 7-12-year-old children conducted by Van Strien and Bazelier (2007) that showed that restrained eating had a negative correlation with external eating but had no relationship with emotional eating.

**RQ #1. Are intrinsic (children’s age, gender, BMI, satiety responsiveness, and hunger/satiety cues) and extrinsic (caregivers’ resourcefulness, dispositional optimism/pessimism, and eating styles – emotional, external, and restrained) contextual factors associated with process regulators (academic stress and dispositional optimism/pessimism)?**

According to Zauszniewski (2006), there are both intrinsic and extrinsic contextual factors; intrinsic contextual factors are the factors within an individual, whereas extrinsic factors are the factors that exist in an individual’s environment such as caregivers’ factors and family context. Based on Rosenbaum’s (1990) theory of learned resourcefulness and Zauszniewski’s (2006) middle-range theory of resourcefulness and quality of life (QOL), contextual factors are determinants of process regulators. In
addition, contextual factors may impact an individual’s underlying disposition (Gailliot et al., 2008) and will determine the level of pressure an individual would have (Rosenbaum, 1988, 1990). Hence, the discussion of the relationships found between contextual factors and process regulators in the current study is delineated by process regulators.

**Relationships between academic stress and contextual factors.** Academic stress was measured by Academic Stress Scale (ASS) (Leung et al., 2010). ASS was first used in a group of Hong Kong Chinese fifth- and sixth-grade children (Leung et al., 2010), and the reported average score of ASS was 18.34 (SD = 5.42). In the current sample, the mean score of ASS was 16.61 (SD = 5.50), which was lower than the Hong Kong Chinese sample. Children’s higher academic stress was related to both intrinsic (i.e. BMI z-score, satiety responsiveness, and school performance) and extrinsic contextual factors (caregivers’ education and family income).

**Relationships with intrinsic contextual factors.**

*Body weight, BMI z-score, age, and gender difference.* Stress has been shown to have a positive correlation with increased body weight or BMI (Koch et al., 2008; Mellbin & Vuille, 1989; Morgan et al., 2002; Sgrenci & Faith, 2011; Van Jaarsveld et al., 2009). Consistent with the studies described above, a small positive correlation between children’s perceived academic stress and BMI z-score was observed in the current sample, indicating higher academic stress levels were associated with higher BMI levels. In addition, no gender differences were found with respect to the level of perceived academic stress, which was consistent with a study conducted by Tseng (2002) with a group of fourth and sixth graders in Taiwan. However, studies have also shown that
gender differences do exist on perceived stress in samples of fifth and sixth graders (Tsai, 2004; M. Wu, 2006) in Taiwan.

*Satiety responsiveness.* Satiety responsiveness is one kind of appetitive trait and represents an individual’s sensitive response to internal satiety signals (Wardle et al., 2001). In normal situations, an individual who is sensitive to his/her internal satiety signals has a smaller appetite and will reduce food intake when s/he experiences the feeling of fullness. Therefore, the individual tends to eat or has appetite to eat only in the absence of satiety. Studies have shown that stress is involved in the regulation of appetite; therefore, loss of appetite is the natural physiological response when individuals are exposed to stressful situations (Bruch, 1964; Van Strien & Oosterveld, 2008; Van Strien & Ouwens, 2003; Van Strien et al., 1986; Zesiewicz, 1992). Hence, theoretically, a higher level of perceived stress is related to a smaller appetite in a natural situation. Consistent with the discussion described above, a small to moderately small, positive correlation between the children’s satiety responsiveness and academic stress was observed in the current sample.

To date, no study was found that directly examined the relationship between perceived academic stress and satiety responsiveness in either the adult or pediatric literature. A study with a group of male Japanese workers found that psychological stress and the feeling of satiety were positively correlated (Nishitani & Sakakibara, 2006), which indicates that an individual with higher psychological stress felt satiety and had a lower appetite to eat. However, another study on stress and food intake in a group of healthy adults noted that no relationship was found between psychological stress and appetitive traits such as hunger and satiety (Rutters, Nieuwenhuizen, Lemmens, Born, &
Westerterp-Plantenga, 2009). Hence, under the natural physiological and psychological circumstances, it was not surprising that the current study found a positive correlation between the children’s satiety responsiveness and academic stress; that is, individuals who are more sensitive to their internal satiety signals perceived a higher level of academic stress.

*Chronic conditions.* Research has shown that academic stress is associated with a variety of negative outcomes such as physical illness (Aheneku et al., 2000; Hystad et al., 2009) and deteriorating mental health (Ang & Huan, 2006; Lee & Larson, 2000). In the current sample, academic stress was found to be higher among the children who had chronic health conditions, which echoes the findings in the literature.

*Relationships with school performance and extrinsic contextual factors (SES).* Among extrinsic contextual factors, caregivers’ education level and family income were found to have inverse relationships with children’s academic stress and school performance. Additionally, children’s academic stress was negatively related to their school performance. The literature revealed that homework and academic performance may contribute to children’s perceived academic stress (Leung et al., 2010). This is consistent with previous research findings (Akgun, 2004; Leung et al., 2010; M. Wu, 2006) indicating an inverse relationship between academic performance and academic stress.

A rich body of literature exists that shows the linkage between SES (e.g. caregivers’ education and family income) and children’s academic performance (e.g. Arnold & Doctoroff, 2003; Bradley & Corwyn, 2002; DeGarmo, Forgatch, & Martinez, 1999), indicating that better academic achievement was related to higher caregivers’
education level and higher family income. Moreover, parents have a significant influence on their children’s appraisals of stressful situations as they grow (Power, 2004), and family context factors, such as family structures (Tseng, 2002; M. Wu, 2006) and parenting styles (Tsai, 2004; Liou, 2003; M. Wu, 2006), were documented to have direct relationships with children’s perceived academic stress. In the current study, children’s better academic achievement was consistently correlated with higher levels of caregivers’ education and family income. However, caregivers’ resourcefulness (Kennett et al., 2012; Zauszniewski, Chung et al., 2002) and dispositional pessimism (Hasan & Power, 2002; Scheier & Carver, 1993; Snyder, 2000), which were related to parental influences and parenting, were found to have no direct relationships with children’s academic stress. Hence, these mixed findings indicate that factors such as a wider age range, family context, and culture may also play an important role in the complicated relationship between academic stress and contextual factors.

**Relationships among dispositional optimism, pessimism, and contextual factors.** Dispositional optimism and pessimism are defined as the degree to which an individual expects to experience positive versus negative outcomes in life (Scheier & Carver, 1985). Some investigations have examined optimism and pessimism as a single bipolar dimension, indicating that greater optimism represents little pessimism (e.g. Cannella, 2006; Harper et al., 2007; Lancastle & Boivin, 2005). Meanwhile, a body of evidence exists that shows optimism and pessimism are not the bipolar ends of a single continuum; in other words, being optimistic does not indicate the absence of being pessimistic (Chang & McBride-Change, 1996; Chang et al., 1994; Lai, 1994; Milam et al., 2004; Plomin et al., 1992). Moreover, how optimists and pessimists cope with adversity
is different (Carver et al., 2009; Dember et al., 1989; Scheier et al., 2001). In the current study, the dimensions of optimism and pessimism were treated as two separate unipolar dimensions and were measured independently.

**Relationships with intrinsic contextual factors.** The correlational results of the study indicated that children’s dispositional pessimism had no association with intrinsic (i.e. age and gender) contextual factors. Meanwhile, children’s dispositional optimism was associated with some of the intrinsic (i.e. satiety responsiveness, hunger/satiety cues, and school performance) contextual factors.

**Age and gender.** Studies have reported that younger children tend to be more optimistic, indicating that age and optimism are inversely related (Giltay et al., 2007; Huang et al., 2003; Schuster et al., 1998). This contrasts with the current study, where neither dispositional pessimism nor optimism was related to age. Likewise, additional studies have found that age and the level of optimism were not correlated (Ey et al., 2005; Lai & Cheng, 2004; Lai & Yue, 2000).

Examinations of gender differences in optimism and pessimism have shown mixed results. This has been shown in studies wherein no gender differences on optimism were found in samples of American and Jordanian college students (Khallad, 2010), Taiwanese junior high school students (Ting, 2002), and Hong Kong Chinese adolescents and adults (Lai & Cheng, 2004). Meanwhile, research has found that in school age children, girls have higher optimism than boys (Ey et al., 2005; Stipek et al., 1981); however, adolescent boys have reported higher optimism than girls (Puskar et al., 2010); similar findings were reported in Taiwanese undergraduates (Lee, 2004).
**BMI.** In the study reported here, children’s BMI was not significantly associated with dispositional optimism or pessimism. Studies of optimism and BMI in children are limited. Consistent with studies found in adult literature, no significant differences in BMI were found among the optimistic and pessimistic participants in a group of older men (Kubzansky et al., 2001) or in a group of Finnish adults of normal weight (Kelloniemi et al., 2005). However, a study of optimism, pessimism, and BMI in a sample of Finnish adults (Kelloniemi et al., 2005) found that the mean BMI of the optimistic participants tended to be lower than that of the pessimistic persons; in addition, the proportion of obese participants was lower among the optimistic women than among the pessimistic women.

*Satiety responsiveness and hunger/satiety cues.* The literature examining the relationships between dispositional optimism/pessimism and satiety responsiveness as well as hunger/satiety cues is limited, and no studies were found in the pediatric population. Tribole and Resch (1996) reported that people with intuitive eating have higher optimism. Likewise, hunger/satiety cues, an important element of intuitive eating, were found to have a moderate correlation with optimism when investigating the relationship between intuitive eating and optimism in a group of female college students (Tylka, 2006). Consistent with Tylka’s (2006) findings, children’s dispositional optimism was moderately related to hunger/satiety cues in the current pediatric sample.

Since an individual’s sensitivity to satiety (satiety responsiveness) and awareness of internal hunger and satiety cues (hunger/satiety cues) are related to various eating styles (Tylka, 2006; Wardle et al., 2001), the relationships between optimism/pessimism...
and satiety responsiveness as well as hunger/satiety cues would be expected to be associated with different eating styles. This will be discussed in later sections.

**Relationships with extrinsic contextual factors.** In the current sample, children’s dispositional optimism was associated with some of the extrinsic (i.e. caregivers’ resourcefulness and family income) contextual factors. However, children’s dispositional pessimism had no association with extrinsic (i.e. SES and caregivers’ dispositional pessimism) contextual factors. Additionally, children’s dispositional optimism and pessimism were negatively correlated.

**SES.** Children’s dispositional optimism had a small correlation with family income, whereas dispositional pessimism had no correlation with family income. These findings are consistent with studies that show children of families with higher SES were documented to have higher levels of optimism than children of families with lower SES (Heinonen et al., 2006; Yen, 2007). However, the findings also conflict with some other studies that noted that SES was not related to levels of optimism (Hirsch et al., 2010; Stipek et al., 1981).

**Caregivers’ dispositional pessimism.** Scholars have proposed that children’s optimism has a heritable component (Gillham & Reivich, 2004) and is developed and individualized within the family context (Ben-Zur, 2003; Carver & Scheier, 1999; Scheier & Carver, 1993; Snyder, 2000); additionally, higher optimism was documented to have a positive correlation with higher family functioning (Sahin et al., 2010) and positive parenting (Hasan & Power, 2002; Scheier & Carver, 1993; Snyder, 2000). Furthermore, Hasan and Power (2002) suggested that maternal modeling is an important factor with respect to children’s development of optimism and pessimism, and they found
that mothers’ pessimism was related to children’s optimism. Hence, theoretically, if parents have a higher degree of optimism, their children will as well, and the same would be expected for parents with higher degrees of pessimism.

In the current sample, there was no evidence to show a significant relationship between children’s dispositional optimism and caregivers’ dispositional pessimism; in addition, no significant relationship was found between dispositional optimism of the child and the caregiver. Indeed, the non-significant relationships among children’s dispositional optimism, pessimism, and caregivers’ dispositional pessimism were consistent with the studies of parents and college students (Brewin et al., 1996), parents and adolescents (Ben-Zur, 2003), and parents and children (Hasan & Power, 2002).

**Caregivers’ resourcefulness.** To date, no study was found that examined the relationships between caregivers’ resourcefulness and their children’s dispositional optimism or pessimism. Adult literature on the relationship between individuals’ optimism and resourcefulness suggests that individuals’ optimism and resourcefulness are positively correlated (Brewin et al., 1996); in addition, optimistic appraisal helps individuals gain personal resources (Boekaerts, 1993) and promote self-control behaviors (Rosenbaum, 1990). Furthermore, caregivers’ resourcefulness is positively related to positive parenting (Kennett et al., 2012), positive parenting is related to the parents’ optimism (Hasan & Power, 2002; Scheier & Carver, 1993; Snyder, 2000), and caregivers’ optimism is positively related to children’s optimism (Gillham & Reivich, 2004); hence, it would not be surprising if caregivers’ levels of resourcefulness were associated with their children’s optimism. In the current sample, although the correlation was weak,
children’s dispositional optimism (but not pessimism) did have a positive relationship with caregivers’ resourcefulness.

The relationships among dispositional optimism, pessimism, and variables discussed above showed mixed results. Consistent with the literature, individuals’ dispositional optimism and pessimism were correlated. Hence, one could infer that dispositional optimism and pessimism are independent yet related concepts.

In summary, the findings of the current study concerning the relationship between contextual factors and process regulators are consistent with empirical studies and support Rosenbaum’s (1990) theory of learned resourcefulness and Zauszniewski’s (2006) middle-range theory of resourcefulness and QOL, both of which suggest that contextual factors have a correlation with process regulators.

RQ #2. Are intrinsic (children’s age, gender, BMI, satiety responsiveness, and hunger/satiety cues) and extrinsic (caregivers’ resourcefulness, dispositional optimism/pessimism, and eating styles – emotional, external, and restrained) contextual factors associated with self-control behavior (children’s resourcefulness skills)?

Resourcefulness is a learned characteristic and varies individually (Rosenbaum, 1990). In addition, it is believed that children are born with no resourcefulness but learn it as they grow and become skilled through modeling or receiving instructions (Kendall & Braswell, 1985; Ronen, 1992; Rosenbaum, 1990). According to Zauszniewski (2006), the impact of contextual factors on resourcefulness can be either direct or indirect. The direct relationships between contextual (intrinsic and extrinsic) factors and resourcefulness are described below.
Relationships with intrinsic contextual factors. In the current sample, children’s resourcefulness skills had a small to moderately small correlation with intrinsic contextual factors (i.e. satiety responsiveness and hunger/satiety cues). In addition, children’s resourcefulness skills were differed by gender: girls had a higher level of resourcefulness skills than boys. However, age and BMI were not related to resourcefulness skills.

Age and gender. The lack of correlation between age and resourcefulness in the current study is consistent with the studies of preadolescent girls (Cawley, 2001) and Thai adolescents with substance addiction (Panitrat, 2001), where no correlation was found between age and resourcefulness. Other studies, however, suggested that age was positively related to resourcefulness in a group of Thai adolescents with asthma (Preechawong et al., 2007), Taiwanese adolescents with depressive symptoms (Huang & Guo, 2009), Israeli school-aged children with aggressive behaviors (Ronen et al., 2007), and women caregivers of adults with mental illness (Zauszniewski et al., 2008).

The results from this study were consistent with the studies in adult population that revealed gender differences existed in relation to resourcefulness in this age group, and females were more resourceful than males (Brewin et al., 1996; Goff, 2011, Zauszniewski et al., 2001). However, the current findings are inconsistent with studies of children and adolescents (Ronen et al., 2007; Preechawong et al., 2007; Zauszniewski, Chung et al., 2002) that showed resourcefulness was not gender related.

Relationships with extrinsic contextual factor -- caregivers’ resourcefulness. In contrast to Zauszniewski and associates’ (2002) findings, a positive relationship was
found between resourcefulness of caregiver and child, whereas children’s resourcefulness was to be unrelated with their caregivers’ resourcefulness in the former study.

Zauszniewski and associates’ (2002) study was conducted with a group of fifth and sixth graders and their mothers in the Midwestern United States. In addition, among the mothers, 98% of them were Caucasian with an average age of 38 years, over 98% had completed high school, and 60% of them had an annual family income greater $40,001. Moreover, 82% of the children were from two-parent homes. Meanwhile, the current study was conducted in a group of Taiwanese fifth- and sixth-grade children as well as their caregivers. Among the caregivers, the average age was 41 years and only 79% of them were mothers. Without investigating family composition and structure, about 89% of the caregivers had completed high school and their reported average monthly family income (NTD 67,022.29, about USD 2,234.08) was lower than the national average per household in 2010, which was NTD 93,646.75 (about USD 3,121.56) (Directorate-General of Budget, Accounting and Statistics, Executive Yuan, Republic of China [Taiwan], 2011). In addition to the differences in demographics information between the current study and Zauszniewski and associates’ (2002) study, parenting styles that related to children’s resourcefulness (Turkel & Tezer, 2008), would need to be considered.

According to Rosenbaum (1990), resourcefulness is acquired through interactions with others. In addition, studies have suggested that children’s resourcefulness is developed within the family context (Preechawong et al., 2007; Rosenbaum, 1980; Turkel & Tezer, 2008). Parenting, the interactions between the parent-child dyad, has been reported to have a profound influence on children’s outcome (e.g. Duckworth, 2011; Finkenauer et al., 2005; Knoche et al., 2007; Power, 2004; Ronen, 1992; Swanson et al.,
2010; Turkel & Tezer, 2008). Specifically, Turkel and Tezer (2008) investigated parenting styles and learned resourcefulness in a group of Turkish adolescents and found that those who had authoritative parents had a higher level of learned resourcefulness as compared to those who had authoritarian parents.

A body of research has documented that different sociocultural contexts hold different views of parenting (e.g. Chao, 2001; Forehand & Kotchick, 1996; Julian, Mckenery, & McKelvey, 1994; Lim & Lim, 2003; Vinden, 2001). For instance, positive effects of authoritative parenting – relative to authoritarian parenting – were found for European Americans but not for first- and second-generation Chinese Americans (Chao, 2001). In addition to cultural differences, researchers also have documented the effects of SES (Bradley, Corwyn, McAdoo, & Garcia-Coll, 2001; Gutman, McLoyd, & Tokoyawa, 2005), marital issues (Belsky, 1984), and parenting stress (Respler-Herman, Mowder, Yasik, & Shamah, 2012) on parenting.

To sum up, the findings of this study on the relationships between contextual factors and resourcefulness support Rosenbaum’s (1990) theory of learned resourcefulness and Zauszniewski’s (2006) middle-range theory of resourcefulness and QOL, which suggest that contextual factors have a correlation with resourcefulness, and that individuals have different degrees of resourcefulness because of different demographic backgrounds and learning experiences.

Resourcefulness can be further categorized into personal and social resourcefulness (Zauszniewski, 2006), and most research focuses on personal resourcefulness (learned resourcefulness) only. Personal resourcefulness includes the skills of positive self-talk, cognitive restructuring, positive behavior change, problem-
solving, and organization (Zauszniewski & Bekhet, 2011). However, children’s resourcefulness includes two attributes, problem-solving and delay of gratification (Zauszniewski et al., 2010), which appears to reflect personal resourcefulness. Therefore, because of limited studies on children’s resourcefulness, further studies examining children’s resourcefulness with direct or indirect effects of cultural differences and age differences are warranted. In addition, investigation is needed on the influencing factors (direct or indirect) on the relationship of resourcefulness between the parent-child dyad.

RQ #3. Are intrinsic (children’s age, gender, BMI, satiety responsiveness, and hunger/satiety cues) and extrinsic (caregivers’ resourcefulness, dispositional optimism/pessimism, and eating styles – emotional, external, and restrained) contextual factors associated with target behavior (children’s eating styles – emotional, external, and restrained)?

Target behavior is the consequence of the self-control process and referred to as health related behaviors (Rosenbaum, 1990). According to Rosenbaum (1990), the relationship between contextual factors and target behavior can be bidirectional. Derived from Rosenbaum’s (1990) theory of learned resourcefulness and Zauszniewski’s (2006) middle-range theory of resourcefulness and QOL, contextual factors and target behavior are correlated and contextual factors will affect target behavior. Target behavior in the current study included three different overeating styles, namely emotional, external, and restrained. The following discussion is arranged by eating styles.

Relationships between emotional eating and contextual factors. Emotional eating suggests that eating occurs in response to emotional arousal such as stress or negative emotions (Van Strien et al., 1986). Children’s emotional eating was found to be
related to school performance (an intrinsic contextual factor) and their caregivers’ restrained eating (an extrinsic contextual factor). Other contextual factors tested in the study reported here were not related to children’s emotional eating.

**Relationships with intrinsic contextual factors.**

*Age, gender, and BMI.* While studies have documented that emotional eating is age-related (Braet et al., 2008; Elfhag & Morey, 2008; Huang, 2008; Van Strien & Bazelier, 2007; Van Strien et al., 2009; Wardle et al., 1992) and gender-specific (Braet et al., 2008; Hill et al., 1994; Van Strien & Bazelier, 2007; Van Strien et al., 2009; Wardle et al., 1992), findings from this study’s age group indicated that emotional eating had no significant relationships with either age or gender.

Children’s emotional eating had no significant association with BMI, which is consistent with prior research (Braet et al., 2008; Caccialanza et al., 2004; Wardle et al., 1992; Wardle et al., 2008). However, mixed findings in the pediatric and adult populations showed that emotional eating was positively related to weight gain (Braet & Van Strien, 1997; Tanofsky-Kraff et al., 2008; Van Strien et al., 2009; Wardle et al., 2009; Webber et al., 2009) or was inversely related to BMI (Ledoux et al., 2011).

*Satiety responsiveness and hunger/satiety cues.* Satiety responsiveness represents an appetitive trait that shows individuals’ ability to reduce food intake after eating in order to regulate energy intake (Wardle et al., 2001). Viana and colleagues (2008) reported that weakened satiety responsiveness was related to higher emotional eating. However, the current sample indicated that satiety responsiveness and emotional eating were not related, which is consistent with other studies (Drapeau, Blundell, Therrien, Lawton, Richard, & Tremblay, 2005; Sleddens et al., 2008; Wardle et al., 2001).
Hunger/satiety cues represent a domain of an intuitive eating style and show individuals’ level of internal awareness capable of hunger sensations and satiety (Tylka, 2006). Since eating is triggered by physiological hunger and satiety cues rather than emotional cues in a natural situation, theoretically, the tendency of emotional eating will be decreased if an individual is more aware of his/her internal hunger and satiety cues. Contrary to findings from an intervention study designed to increase intuitive eating, which found that individuals decreased emotional eating as they increased intuitive eating behaviors (Hawks, Madanat, Smith, & De La Cruz, 2008), no relationship was found between hunger/satiety cues and emotional eating in this study’s participants.

School performance. Studies examining the relationship between emotional eating and school performance are limited. While mixed findings exist, certain scholars have suggested that different aspects of eating behavior have dissociable effects on cognitive-affective function, especially in adult dieters (Vreugdenburg, Bryan, & Kemps, 2003; Williams et al., 2002). For example, Rogers and Green (1993) suggested that female undergraduates who were dieting performed poorer on cognitive tasks. Likewise, Bryan and Tiggemann (2001) noted that female adults who were dieters had a positive relationship with emotional eating and of which had an impact on cognitive performance. On the other hand, Williams and associates (2002) found that emotional eating and cognition had no direct relationship. Brunstrom, Davison, and Mitchell (2005) also found that emotional eating did not predict cognitive performance with a group of elementary girls (mean age was 10 years); in addition, although an individual’s cognitive performance and academic achievement are not identical, they are highly correlated with each other.
The present study examined a community sample of children, who were not identified as dieters, and found a small, negative correlation between emotional eating and academic stress, indicating that children who had better school performance had a lower tendency toward emotional eating. The results were consistent with the findings found in previous research as described above. According to psychosomatic theory (Bruch, 1964, 1997; Ganley, 1989), emotional eating represents the tendency to eat in response to negative mood states. In addition, Van Strien and Ouwens (2007) noted that a higher degree of emotional eating points toward a deficient inner cognitive and affective structure. Hence, although the underlying contributors between emotional eating and academic achievement may be complicated and have multiple origins, it is believed that psychological characteristics, such as mood (Thayer, 2001; Van Strien & Oosterveld, 2008; Van Strien & Ouwens, 2003; Williams et al., 2002) and stress (O’Connor et al., 2008; Van Strien et al., 1986), play an important role on the mechanism between emotional eating and academic achievement.

**Relationships with extrinsic contextual factor – caregivers’ eating styles.** Tholin and colleagues (2005) found that 60% of emotional eating is genetically derived; in addition, Davison and Birch (2001) suggested that children’s eating behaviors are similar to their parents’. Likewise, studies reported that parents’ and children’s emotional eating styles were positively correlated (Brown & Ogden, 2004; Jahnke & Warschburger, 2008; Snoek, Van Strien et al., 2007). However, in the present sample, the children’s and caregivers’ emotional eating styles were not correlated.

The present study showed an unexpected association between caregivers’ restrained eating and children’s emotional eating – caregivers’ restrained eating was
negatively correlated to children’s emotional eating. Parents influenced their children’s eating (Cutting et al., 1999; Davison & Birch, 2001); in addition, parenting also plays an important role in shaping children’s eating behaviors through modeling (Scaglioni et al., 2008; Thompson, 2010; Ventura & Birch, 2008). Studies have found that mothers who were preoccupied with their own eating, which was associated with restrained eating (Williams et al., 2002), reported higher levels of restricting their children’s intake (Anschutz et al., 2009; Francis & Birch, 2005). According to Van Strien and Bazelier (2007), parental pressuring or restrictive controlling of food intake may be negatively associated with the development of interoceptive awareness of a child and the child may be at a risk of becoming an emotional eater. Furthermore, children’s perceived parental restriction to eat was significantly related to a lower level of emotional eating (Van Strien & Bazelier, 2007). Hence, it was possible that for caregivers who had the tendency toward restrained eating, their children had a lower tendency of emotional eating. However, a study conducted in France to examine correlations of eating styles between parents and adolescents found that parents’ restrained eating was positively related to adolescents’ emotional eating (de Lauzon-Guillain et al., 2009). Since studies are limited and have had mixed results, more studies should investigate the inter-correlations among caregivers’ eating styles, parenting, and children’s eating styles and the possible mediating role of parenting in these correlations.

**Relationships between external eating and contextual factors.** External eating indicates that eating is in response to external cues such as sight or smell (Van Strien et al., 1986). None of the contextual factors (e.g. age, gender, BMI, caregivers’ eating styles) examined in this study had relationships with children’s external eating.
Relationships with intrinsic contextual factors.

Age, gender, and BMI. According to Birch and associates (2003), children are especially susceptible to environmental stimuli such as the presence of palatable foods. Several studies (Braet et al., 2008; Elfhag & Morey, 2008; Van Strien & Bazelier, 2007; Van Strien et al., 2009; Wardle et al., 1992) have shown that external eating and age are correlated. However, findings from the present study show that external eating and age are unrelated. These findings are consistent with findings from French adolescents (Lluch, Herbeth, Mejean, & Siest, 2000) and from American children and adolescents (Ledoux et al., 2011).

In the current sample, no gender differences were found on external eating, which is consistent with a study conducted in children age 9-10 years (Ledoux et al., 2011), adolescents (Wardle et al., 1992), as well as in a representative Dutch sample that consisted varied age-groups and the primary target group was aged 20-40 (Van Strien et al., 2009). However, studies also showed that external eating was related to gender and boys engaged in more external eating (Braet et al., 2008; Hill et al., 1994; Van Strien & Bazelier, 2007).

The findings on the relationship between external eating and BMI have been mixed. External eating has been reported to have a positive relationship with body weight in children (Braet & Van Strien, 1997; Wardle et al., 2009; Webber et al., 2009). In addition, external eating has been more obvious in overweight groups when comparing them with normal-weight groups (Braet et al., 2008). However, studies have revealed that external eating was negatively related to BMI in female children (Ledoux et al., 2011) and in preadolescent children (Ouwens, Cebolla, & Van Strien, 2012). On the contrary,
findings from the current sample are consistent with other research that showed external eating and BMI were unrelated in preadolescent children (Caccialanza et al., 2004), obese adults (Elfgan & Morey, 2008), and a representative Dutch sample with many different age-groups (Van Strien et al., 2009).

*Satiety responsiveness and hunger/satiety cues.* Derived from externality theory, it was thought that overweight individuals tended to eat larger amounts because they were less responsive to internal appetitive signals such as hunger and satiety (Fisher et al., 2007; Fisher & Birch, 2002; Schachter & Rodin, 1974; Van Strien & Oosterveld, 2008; Van Strien & Ouwens, 2003); in fact, hyper-responsiveness to external food cues was apparent in all weight groups (Rodin & Slochower, 1976; Milstein, 1980). Hence, while most studies indicated that being less responsive to satiety was related to higher external eating, external eating was found to have no relationship with satiety responsiveness or internal hunger/satiety cues in the age group within the current study, which is consistent with a study conducted with a group of adults that found that eating styles and appetite were not correlated (Drapeau et al., 2005).

*Relationships with extrinsic contextual factors – caregivers’ eating styles.* Jahnke and Warschburger (2008) found a positive correlation between mothers’ and children’s external eating. However, in the current sample, no relationship was found for external eating between caregivers’ and their children’s eating styles, which is consistent with a study reported by Brown and Ogden (2004). According to Davison and Birch (2001), parents have influences on their children’s eating behaviors. In addition, Fisher and Birch (1999) reported that parenting with excessive restriction of a child’s access to highly palatable foods will promote the child’s over-consumption of those restricted...
foods once they are available. Furthermore, Moens and Braet (2007) stated that external eating is considered a personality characteristic or a learned behavior. Since studies have indicated that family functioning (Hasenboehler et al., 2009) and parenting behavior related to pressure or restriction to eat (Carper et al., 2000; Van Strien & Bazelier, 2007) were related to children’s external eating, more studies should examine the possible mediating effects of family functioning and parenting on the relationship between external eating of the caregiver and the child.

**Relationship between restrained eating and contextual factors.** Restraint eating refers to eating that is less than desired in order to maintain or lose weight (Van Strien et al., 1986). Among the intrinsic contextual factors, BMI and satiety responsiveness were found to have positive correlations with restrained eating. Caregivers’ BMI and restrained eating (extrinsic contextual factors) were also found to have significant, positive relationships with children’s restrained eating.

**Relationship with intrinsic contextual factors.**

*Age, gender, and BMI.* The findings from the current study are consistent with previous studies’ findings in which restrained eating was found to be unrelated to age (Braet et al., 2008; Elfhag & Morey, 2008; Ledoux et al., 2011) and gender (Braet et al., 2008; Ledoux et al., 2011; Peng, 2006). In contrary, some studies have reported that restrained eating had gender differences in children, with girls scoring higher on restrained eating than boys (Van Strien & Bazelier, 2007; Wardle et al., 1992).

While mixed results showed that restrained eating was related to lower body weight (Boschi et al, 2001) or unrelated to BMI in obese adults (Elfgan & Morey, 2008) and in 9-10 year old girls (Ledoux et al., 2011), in the current sample, restrained eating
was moderately associated with higher BMI. This finding is congruent with previous studies (e.g. Braet & Van Strien, 1997; Braet et al., 2008; Elfhag & Linne, 2005; Peng, 2006; Snoek, Van Strien et al., 2007; Van Strien et al., 2009).

**Satiety responsiveness and hunger/satiety cues.** According to restraint theory (Herman & Polivy, 1983), individuals who are restrained eaters tend to be under-responsive to satiety cues and have a weakening of normal appetitive controls, especially in those who are obese or dieting (Brunstrom et al., 2004; Herman & Polivy, 1983; Llewellyn, Carnell, & Wardle, 2011; Lowe, 1993; Van Strien & Oosterveld, 2008; Wardle & Beales, 1988). Studies have also suggested that those who eat in response to their internal hunger and satiety cues are less likely to be preoccupied with food and have the tendency toward restrained eating (Hawks et al., 2008; Faith, Scanlon, Birch, Francis, & Sherry, 2004). Alternatively, restrained eating has been reported to be associated with better eating habits (Wardle, 2007; Elfhag et al., 2010). Furthermore, inconsistent study results have suggested that satiety responsiveness may not be related to restrained eating (Drapeau et al., 2005; Ogden & Wardle, 1990; Tepper, 1992). In the current sample of fifth and sixth graders in Taiwan, restrained eating had a small to moderately small positive relation to satiety responsiveness, indicating that children who had higher sensitivity to internal satiety cues had a higher tendency toward restrained eating; this finding is inconsistent with the findings discussed previously. Restrained eating had no significant relationship with awareness of internal hunger and satiety cues. Since few studies have been conducted to examine the relationships between restrained eating and satiety responsiveness as well as awareness of hunger and satiety cues in children, more studies with varied age groups and cultural backgrounds are warranted.
School performance. Restrained eating was reported to be associated with a preoccupation with thoughts concerning food and weight (Williams et al., 2002), which contributes to cognitive impairment (Vreugdenburg et al., 2003) and has a number of unwanted consequences, such as depression (Rosen, Gross, & Vara, 1987) and an increased risk of developing an eating disorder (Hsu, 1997). On the other hand, a study of female preadolescents (Brunstrom et al., 2005) showed that restrained eating was related to poorer academic performance. In the current study, however, no relationship was found between restrained eating and school performance.

Relationship with extrinsic contextual factors (caregivers’ BMI and restrained eating). Munsch and associates’ (2007) reported that mothers’ restrained eating had a significant positive correlation with overweight children’s restrained eating. In the current sample, which consisted of normal and overweight children, findings were also consistent with Munsch and associates’ study, showing that children’s restrained eating also had a small correlation in a positive direction to both caregivers’ BMI and restrained eating, indicating that for children who had a tendency toward restrained eating, their caregivers tended to have higher BMI and a higher tendency toward restrained eating.

Parents play an important role in shaping and modeling children’s eating styles; hence, their eating styles are very likely to be similar (Cutting et al., 1999; Davison & Birch, 2001). In addition, eating behavior is believed to have a genetic association (Fisher et al., 2007). For example, Steinle and associates (2002) found heritability estimates of 28% for restrained eating in 624 adults who were from 28 families. Moreover, Williams and associates (2002) suggested that restrained eating is highly associated with a preoccupation with thoughts concerning food and weight. These findings are consistent
with a study conducted in the Eastern U.S. with a group of non-Hispanic, White, mother-daughter dyads, which found that the mothers’ preoccupation with their own weight and eating was linked to their daughters’ restrained eating (Francis & Birch, 2005).

In conclusion, the findings from the current study on the relationship between contextual factors and target behavior (eating styles) are consistent with empirical studies and support theories related to eating styles and theories of resourcefulness proposed by Rosenbaum (1990) and Zauszniewski (2006), which indicate that contextual factors are associated with target behavior. In addition, the findings also support that familial transmission of eating styles does exist (Jahnke & Warschburger, 2008; Munsch et al., 2007). Since inconsistent results exist and limited literature is available, more studies are needed to focus on the relationships between children’s appetite traits and eating styles, the similarities and differences of eating styles within caregiver-child dyads, and the relationship among caregivers’ eating styles, parenting, and children’s eating styles.

RQ #4. What are the strengths and directions of the relationships between process regulators (academic stress and dispositional optimism/pessimism) and the self-control behavior (children’s resourcefulness skills)?

Based on theories of resourcefulness (Rosenbaum, 1990; Zauszniewski, 2006), process regulators are cognitive processes used by individuals to evaluate the situations they face (Rosenbaum, 1990); in addition, process regulators have direct effects on resourcefulness (Zauszniewski, 2006; Zauszniewski et al., 2008). There were three process regulators -- academic stress, dispositional pessimism, and dispositional optimism -- in the study reported here.
Consistent with a study conducted by Leung and He (2010), children’s academic stress had a small to moderately small association in a negative direction with resourcefulness skills, which indicated that children with higher resourcefulness had lower academic stress. Also, this finding is similar to the studies that reported in studies of adolescents and adults that those with higher resourcefulness had lower academic stress (Akgun, 2004; Akgun & Ciarrochi, 2003; Kennett, Worth et al., 2009). In addition, higher resourcefulness was associated with lower perceived stress among Chinese adult participants (Au, 2010, Ngai & Chan, 2011, 2012; Rong, 2000). Although studies of children’s resourcefulness are limited, the findings from the current study are similar to the studies conducted by scholars that revealed highly resourceful children had fewer symptoms of stress, anxiety, and depressive symptoms (Chang et al., 2007; Hamama et al., 2000; Hamama et al., 2008).

How optimists and pessimists cope with adversity is different (Carver et al., 2009; Dember et al., 1989). Studies have found that optimists use more positive coping skills than do pessimists (Aspinwall & Taylor, 1992; Ben-Zur et al., 2000; Carver et al., 1993; Lai & Wan, 1996; Scheier et al., 1986; Schwarzer, 1994; Solberg Nes & Segerstrom, 2006; Strutton & Lumpkin, 1992); additionally, Scheier and colleagues (2001) reported that optimists are better adjusted to life’s difficulties than pessimists. Interestingly, an optimism training program for fifth graders conducted in Taiwan found that this training program elevated their level of optimism but had no effects on decreasing their pessimism (Wu, Chen et al., 2008). In the current study, dispositional optimism and pessimism were significantly correlated with resourcefulness, but in opposite directions; in addition, the strength of the correlation with optimism was stronger than that of
pessimism. Furthermore, the relationship between children’s dispositional optimism and resourcefulness that was found in this study is consistent with findings from Brewin and colleagues’ (1996) study, which reported that optimism and resourcefulness were positively correlated in undergraduates. Moreover, this finding also echoes the claims that stated optimistic appraisal is essential to gain personal resources (Boekaerts, 1993) and to promote self-control behaviors (Rosenbaum, 1990).

Dispositional optimism represents cognitive aspects of an individual (Ben-Zur, 2003) and is considered one type of positive cognition (Brewin et al., 1996). In addition, emotional and/or cognitive strain has an influence on an individual’s resourcefulness (Orr & Westman, 1990). Hence, studies have shown that positive cognition predicted higher resourcefulness (Bekhet et al., 2008; Bekhet et al., 2011; Zauszniewski, Chung et al., 2002; Zauszniewski, McDonald et al., 2002), which is similar to the findings from the current study.

In summary, the findings from the present study support not only Rosenbaum’s (1990) theory of learned resourcefulness and Zauszniewski’s (2006) middle-range theory of resourcefulness and QOL but also some empirical investigations, which indicate that process regulators and self-control skills (resourcefulness) are correlated.

RQ #5. What are the strengths and directions of the relationships between process regulators (academic stress and dispositional optimism/pessimism) and the target behavior (children’s eating styles – emotional, external, and restrained)?

According to Rosenbaum (1990), target behavior is the consequence of self-control (i.e. resourcefulness) and the relationship between process regulators and target behavior can be bidirectional. Hypothesized relationships between process regulators and
target behavior are derived from empirical evidence as well as Rosenbaum’s (1990) theory of learned resourcefulness and Zauszniewski’s (2006) middle-range theory of resourcefulness and QOL, indicating that process regulators and target behaviors are related.

**Academic stress.** Consistent with psychosomatic theory (Bruch, 1997; Ganley, 1989) and empirical studies (Adam & Epel, 2007; Austin et al., 2009; Carper et al., 2000; Chen et al., 2007; Huang, 2008; Lee, 2007; Macht et al., 2005; O’Connor et al., 2008; Serlachius et al., 2007; Thayer, 2001; Torres & Nowson, 2007; Van Strien & Oosterveld, 2008; Van Strien & Ouwens, 2003) higher perceived psychological stress is associated with higher levels of emotional eating. According to the theory and empirical evidence described above, the effects of unmanaged stress on health and health-related behaviors have been documented, including weight gain and unhealthy eating behaviors (Austin et al., 2009; Chen et al., 2007; Levin & Munsch, 2011; Macht et al., 2005; Martyn-Nemeth et al., 2009; Nguyen-Rodriguez et al., 2008; O’Connor et al., 2008; Sgrenci & Faith, 2011; Van Jaarsveld et al., 2009).

Derived from externality theory, external eating means eating in response to external food cues (Jansen et al., 2003; Schachter, 1968; Van Strien et al., 1986); in other words, external eaters tend to be hyper-responsive to external food cues (Rodin & Slochower, 1976; Milstein, 1980) and less responsive to internal hunger and satiety cues (Fisher et al., 2007; Schachter & Rodin, 1974; Van Strien & Oosterveld, 2008; Van Strien & Ouwens, 2003). Hence, most studies focus on the relationships between stress and emotional/restrained eating, and the relationship between stress and external eating has been relatively neglected. Consistent with studies conducted by Conner and
associates (1999) and Newman and associates (2008), external eating has been related to stress as well in adult samples, indicating that greater stress was related to a higher tendency toward external eating. A similar study with a group of children between the ages of 9 and 12 found that external eating was associated with negative feelings (Braet & Van Strien, 1997). Beyond externality theory, certain scholars have provided rationalizations for the relationship between external eating and stress. For example, Newman and associates (2008) stated that external eaters increase amount of intake when stressed because their attentions shift towards food stimuli. Likewise, O’Conner and associates (2008) proposed that stress boosted the reaction to food cues, so stress acted as a stimulus to eat among those already high in scores for external eating. However, contrary to the studies described above, there are still others that indicated that stress and external eating were not related in adult samples (Oliver, Wardle, & Gibson, 2000; Van Strien et al., 1995).

Based on restraint theory (Herman & Polivy, 1983), restrained eating is a consequence of unsuccessful dieting, and dieting is easily abandoned when self-control is inhibited by stress, emotions, or anxiety (Herman & Polivy, 1983, 2011; Van Strien & Ouwens, 2003). That is, restrained eaters are particularly vulnerable to adverse effects of stress as it can influence their food intake (Heatherton & Baumeister, 1991; Wardle, Steptoe, Oliver, & Lipsey, 2000). Although the aim of current study was not dieting, and dieting behavior was not investigated, children’s academic stress was positively correlated with restrained eating. This finding was consistent with studies in both pediatric and adult samples indicating that a higher perceived stress is related to a higher
level of restrained eating (Carper et al., 2000; Herman & Polivy, 2011; Huang, 2008; Roemmich et al., 2002; Thayer, 2001; Wardle et al., 2000).

In summary, although studies on stress and eating styles in the pediatric population are limited and the findings remain inconsistent, perceived academic stress was related to all the eating styles indicated in the current study with a weak strength and positive direction, suggesting that higher stress was related to a higher tendency toward emotional, external, and restrained eating.

**Dispositional optimism/pessimism.** Research on the relationships between dispositional optimism/pessimism and eating styles is limited. A rich body of literature suggests that dispositional optimism has an important effect on health and health-related behaviors (Cassiday, 2000; Tusaie & Patterson, 2006), whereas dispositional pessimism, which refers to the degree to which an individual cognitively appraises situations and anticipates experiencing negative outcomes (Scheier & Carver, 1985), is related to negative thinking (Norem & Chang, 2002), negative emotion (Scheier et al., 1994), and health-damaging behaviors (Carver et al., 2010). Furthermore, a related study found that both positive and negative moods cause overeating; but, negative moods are usually the main cause (Thayer, 2001). In contrast, Macht and colleagues (2004) proposed that positive emotions play a stronger role than negative emotions in the relationship between emotions and overeating. In summary, although findings in the literature are inconsistent, being optimistic is hypothesized to have a relationship with positive eating styles (lower scores of eating styles in the current study), whereas being pessimistic is hypothesized to be related to dysfunctional eating behaviors (higher scores of eating styles in current study). In fact, studies have shown that intuitive eating (one type of positive eating
behavior -- eating in response to internal physiological hunger and satiety cues) (Tribole & Resch, 1996; Tylka, 2006) was positively associated with dispositional optimism in adults (Tribole & Resch, 1996; Tylka, 2006; Tylka & Wilcox, 2006).

However, in the current sample, optimism was related to higher levels of restrained eating and lower levels of external eating, whereas pessimism was unrelated to these eating styles. Since optimists and pessimists cope with adversity differently (Carver et al., 2009; Dember et al., 1989), with optimists tending to adopt problem-focused coping strategies and pessimists tending to use avoidance coping strategies (Aspinwall & Taylor, 1992; Carver et al., 2010; Carver & Scheier, 2005; Solberg Nes & Segerstrom, 2006), optimists are psychologically and physically better adjusted to difficulties than pessimists (Carver et al., 2020; Carver & Scheier, 1998; Scheier et al., 2001), and overeating styles can be provoked by stress and ineffective coping to a greater extent for pessimists (Chen et al., 2007; Levine et al., 1994; Martyn-Nemeth et al., 2009; Serlachius et al., 2007; Talen & Mann, 2009; Torres & Nowson, 2007). It is possible that these vague and unsolved relationships may reflect the influence of other mediating variables (e.g. coping strategies, resourcefulness) that need further examination.

In summary, the findings support Rosenbaum’s (1990) theory of learned resourcefulness and Zauszniewski’s (2006) middle-range theory of resourcefulness and QOL, indicating process regulators and target behaviors are related; in addition, the findings also support some eating styles-related theories (e.g. psychosomatic and restraint theories) and empirical evidence.
RQ #6. What is the strength and direction of the relationship between self-control behavior (children’s resourcefulness skills) and the target behavior (children’s eating styles – emotional, external, and restrained Eating)?

In the current sample, the children’s resourcefulness skills were related to lower levels of emotional and external eating, but were unrelated to restrained eating. The findings are consistent with studies conducted by scholars with both child and adult populations that suggest poor self-control and lower resourcefulness had an influence on eating due to negative emotions (Elfhag & Morey, 2008) and would intensify emotional eating (Leon & Rosenthal, 1984). Likewise, the current finding concerning the relationship between resourcefulness and external eating was consistent with studies in various pediatric and adult populations, suggesting that individuals’ poor self-control or lower resourcefulness was related to external eating (Elfhag & Morey, 2008; Leon & Rosenthal, 1984).

Restrained eating refers to intentional restriction of food intake, which in some people may be associated with overeating when the resolve to control food intake is abandoned (Van Strien et al., 1986; Wardle, 1987). Restrained eating has been reported to be associated with both higher (Elfhag & Linne, 2005) and lower body weights (Boschi et al., 2001; Jasinska et al., 2012); in addition, restrained eating was found to be related to healthier food intake (Elfhag et al., 2008). When examining the relationship between resourcefulness and restrained eating, Lowe (1993) reported that highly resourceful restrained eaters would cope better with cognitive disruptions caused by the pre-meal administration of food (preload of food) and would have less preload-induced eating. In addition, restrained eaters who were good at self-control would be more
successful in controlling their eating style and have lower BMI (Fishbach et al., 2003; Jasinska et al., 2012; Papies et al., 2008; Elfhag & Morey, 2008). Unexpectedly, resourcefulness and the tendency toward restrained eating were unrelated in the current sample that was consistent with a study conducted by Kirschenbaum and Dykman (1991) in a group of adult females.

According to restraint theory (Herman & Polivy, 1983), restrained eating requires cognitive regulation on eating and has the following characteristics: (1) restrained eaters tend to eat less than anticipated in order to maintain weight, and (2) a disinhibiting effect (associated with overeating when the determine to restrict food intake is given up) occurs when dietary self-control is suppressed by emotions or stress. Meanwhile, resourcefulness involves a broad collection of self-control skills and self-regulatory behaviors, and individuals will need to use cognitions to self-regulate and self-manage their behaviors in order to engage in health-related behaviors (Rosenbaum, 1990). In other words, highly resourceful individuals, compared to those who are low in resourcefulness, are more skilled at using cognitions to control their physiological responses and are more convinced of their abilities to self-regulate. Apparently, both children’s resourcefulness and restrained eating involve a great deal of cognitive regulation, but the relationship between children’s resourcefulness and restrained eating has been somewhat controversial in the literature, for both of these factors can be influenced by parenting or other contextual factors. Hence, there is a need for more studies with various populations to further examine the possible mediating roles that contextual factors may have on children’s resourcefulness and children’s restrained eating, as well as on the relationship between the two.
Taken together, consistent with theories of resourcefulness and studies of resourcefulness in both pediatric and adult samples, resourcefulness has a positive impact on mental/physical health and behavioral outcomes; that is, highly resourceful individuals were more likely to have healthier behaviors (Birkimer et al., 1993; Cawley, 2001), practice healthy eating (Kennett, Worth et al., 2009), and are less likely to have eating disturbances (Kennett & Nisbet, 1998). Moreover, although studies of resourcefulness have focused primarily on adolescents and adults, and literature on children’s resourcefulness is limited, the findings of the current study are consistent with those of the literature dealing with adolescents and adults. In addition, the findings also support theories of resourcefulness (Rosenbaum, 1990; Zauszniewski, 2006), indicating children’s self-control behavior (resourcefulness skills) and their health-related behavior (eating styles -- emotional and external eating) are correlated.

RQ #7. While controlling for covariates, how do process regulators (academic stress and dispositional optimism/pessimism) mediate intrinsic (children’s age, gender, BMI, satiety responsiveness, and hunger/satiety cues) and extrinsic (caregivers’ resourcefulness, dispositional optimism/pessimism, and eating styles -- emotional, external, and restrained) contextual factors on self-control behavior (children’s resourcefulness skills)?

Derived from Rosenbaum’s (1990) theory of learned resourcefulness and Zauszniewski’s (2006) middle-range theory of resourcefulness and QOL, the current study investigated whether the effects of contextual factors on resourcefulness were mediated by process regulators (See Figure 1.3). Three parallel regression analyses were used to examine the potential mediating effects of academic stress, dispositional
optimism, and dispositional pessimism on the relationship between contextual factors and resourcefulness skills. As a result, academic stress and dispositional optimism mediated the effects of some of the contextual factors (e.g. satiety responsiveness or hunger/satiety cues) on resourcefulness. Dispositional pessimism was not a predictor of resourcefulness (See Table 4.18, Equation 2, path b); therefore, no evidence was found to show that dispositional pessimism had a mediating effect on the relationship between contextual factors and resourcefulness skills.

**Academic stress as a mediator.** When academic stress was tested as a mediator while controlling for covariates, it was found that academic stress had a partial mediating effect on the relationship between satiety responsiveness and resourcefulness. More specifically, children’s satiety responsiveness not only had a direct effect on resourcefulness but also an indirect effect on resourcefulness through academic stress. Likewise, caregivers’ emotional eating had no direct effect on children’s resourcefulness, but it did have an indirect effect on children’s resourcefulness through children’s academic stress.

This is the first study to test the effect of academic stress in mediating the effects of contextual factors on resourcefulness. Some researchers have proposed a potential mediating role of perceived stress on different aspects of outcomes. For example, Rice and colleagues (2006) reported that perceived stress mediated the effects of perfectionism on adjustment among university honors students. Likewise, perceived stress was reported as a mediator on the relationships between coping and the QOL of HIV-positive women (Weaver et al., 2004) as well as life-events and QOL following breast cancer diagnosis (Beatty, Lee, & Wade, 2009). Moreover, if an individual’s response to satiety was
associated with increased academic stress, academic stress, the mediator, helped in explaining why satiety responsiveness was associated with lower resourcefulness, and why satiety responsiveness was related to eating styles. This is because stress has known deleterious effects on eating styles among diverse populations (Chen et al., 2007; Martyn-Nemeth et al., 2009; Nguyen-Rodriguez et al., 2008; Serlachius et al., 2007; Talen & Mann, 2009). Hence, the finding addresses the influence of academic stress and the importance of developing programs to decrease academic stress.

**Dispositional optimism as a mediator.** When testing the mediating effect of dispositional optimism on the relationship between contextual factors and resourcefulness while controlling for covariates, children’s awareness of hunger/satiety cues had no direct effect but did have an indirect effect on resourcefulness through dispositional optimism. That is, children had greater resourcefulness when they had more dispositional optimism, increasing the level of awareness of internal hunger/satiety cues.

This was the first study to test the mediating effect of dispositional optimism on the relationship between contextual factors and resourcefulness in both pediatric and adult populations. Studies examining the mediating effect of positive cognition on the relationship between resourcefulness and other variables, as described below, across diverse populations have suggested that positive cognition was a mediator between alienation and resourcefulness among first-year nursing students in Egypt (Bekhet et al., 2011), between depressive symptoms and learned resourcefulness in women with type 2 diabetes (Zauszniewski, McDonald et al., 2002), and between caregiver burden and resourcefulness among various groups of caregivers (Bekhet, 2012; Bekhet, Johnson, & Zauszniewski, 2012; Zauszniewski, Bekhet, & Suresky, 2009a).
Numerous studies have examined the mediating effect of dispositional optimism among various populations within different scenarios. For instance, Chong and associates (2006) reported that dispositional optimism partially mediated perceptions of parent, peer, and school support and psychological adjustment in a group of Asian adolescents. Gill and Loh (2010) demonstrated that dispositional optimism partially mediated the relationship between perceived stress and health-promoting behaviors in new primiparous mothers. Greenberg and colleagues (2004) also supported the influence of dispositional optimism as a mediator of the effects of quality of the mother/adult child relationship on maternal psychological well-being among maternal caregivers with disabled adult children. Likewise, Ruthig and associates (2007) found that dispositional optimism mediated the effects of falling on health and well-being among the old-old adults (ages 85 years and above) when compared to young-old group (ages less than 85 years).

In addition, cognitive appraisal may be conceptualized as a process regulator. According to the Transaction Model of Stress and Coping (Lazarus & Folkman, 1984), cognitive appraisal is important within the stress response and mediates how individuals cope with stressful situations. In addition, contextual factors (e.g. individual and environmental factors) influence how cognitive appraisal works (Lazarus & Folkman, 1984). Hence, the findings from the current study on the mediating roles of academic stress (stress appraisal) and dispositional optimism (benign positive appraisal) not only support the Transaction Model of Stress and Coping (Lazarus & Folkman, 1984) but also the empirical evidence (Abramson et al., 1989; Lightsey, 1997), indicating that cognitive appraisal mediates the stressful personal environment relations and their outcomes.
Both academic stress and dispositional optimism may reflect individual cognitive appraisal and therefore have a mediating effect on the relationship between contextual factors and resourcefulness skills. This finding supports empirical studies and resourcefulness theories (Rosenbaum, 1990; Zauszniewski, 2006) as well as the Transaction Model of Stress and Coping (Lazarus & Folkman, 1984), thereby suggesting that process regulators (i.e. academic stress and dispositional optimism) can be mediating, intervening variables that may be influenced by contextual factors and have direct effects on resourcefulness.

In conclusion, based on the discussion presented above, which suggests there is a deleterious role of academic stress and a protective role of dispositional optimism in the relationship between contextual factors and resourcefulness among fifth and sixth graders, it is suggested that reducing academic stress and improving dispositional optimism can have a positive effect on helping a child to develop resourcefulness skills. The findings highlight the importance of developing interventions to minimize academic stress or to strengthen dispositional optimism in order to enhance resourcefulness skills in children.

RQ #8. How does self-control behavior (children’s resourcefulness skills) mediate process regulators (academic stress and dispositional optimism/pessimism) on target behavior (children’s eating styles – emotional, external, and restrained)?

Based on the study model (See Figure 1.3), mediation analyses were performed if children’s resourcefulness skills functioned as a mediator in the relationships between process regulators (academic stress, dispositional pessimism, and dispositional optimism) and eating styles (emotional, external, and restrained).
Using a series of hierarchical regression analyses, children’s resourcefulness skills mediated the effects of academic stress and dispositional optimism on emotional and external eating. Although this is the first study that examined the mediating role of resourcefulness among fifth- and sixth-grade children, these findings were consistent with previous studies indicating resourcefulness has a mediating role on the relationship between study variables in adolescent and adult populations. For example, a rich body of adolescent and adult literature has shown that resourcefulness mediates the effects of perceived health on depressive symptoms among a group of Taiwanese adolescents (Huang et al., 2005; Huang & Guo, 2009), the effects of stress on depressive symptoms during pregnancy and at six weeks postpartum in a group of Chinese mothers (Nagi & Chan, 2012), the effects of depressive symptoms on positive ideation among a group of hospital nurses in Taiwan (Chung et al., 2012), the effects of glycemic control on depressive symptoms (Huang et al., 2007) as well as QOL (Huang et al., 2008) among Taiwanese adults with diabetes, the effects of perceived stress on adaptive functioning in Taiwanese elders (Rong, 2000), and the effects of depression on health practices in women with type 2 diabetes (Zauszniewski & Chung, 2001).

No mediating effect of resourcefulness on restrained eating was found because resourcefulness did not have a predictive effect on restrained eating. The findings are also consistent with studies indicating that resourcefulness was not a mediator on the relationships among certain variables. For instance, no mediating effect by learned resourcefulness was found on the relationship between personal beliefs and adaptive functioning in depressed adults (Lai, 2005). Bekhet and associates (2008) also reported that learned resourcefulness did not mediate the effects of positive cognitions on
relocation adjustment in elders. Likewise, Goff (2011) did not find learned resourcefulness to have mediating effect on the relationships between academic/personal stressors and academic performance in baccalaureate nursing students. Moreover, a study conducted with a group of patients with breast cancer in Taiwan also reported that learned resourcefulness did not mediate the effects of stress on depressive symptoms and QOL (Huang et al., 2010).

Although studies of the mediating role of resourcefulness have had inconsistent results, this study’s findings help to explain the relationship between a child’s academic stress/dispositional optimism and emotional/external eating. In addition, a child’s resourcefulness skills acted as a mediator to help strengthen the relationship. Specifically, resourcefulness may protect against the development of unhealthy eating styles, especially emotional and external eating styles. Moreover, the findings support resourcefulness theories (Rosenbaum, 1990; Zauszniewski, 2006) that suggest resourcefulness mediates the effects of process regulators on target behaviors. Hence, interventions are needed to increase a child’s resourcefulness skills and thereby enhance positive eating styles.
RQ #9. While controlling for covariates, how do process regulators (academic stress and dispositional optimism/pessimism) and self-control behavior (children’s resourcefulness skills) mediate intrinsic (children’s age, gender, BMI, satiety responsiveness, and hunger/satiety cues) and extrinsic (caregivers’ resourcefulness, dispositional optimism/pessimism, and eating styles – emotional, external, and restrained) contextual factors on target behavior (children’s eating styles – emotional, external, and restrained)?

Informed by the study model (See Figure 1.3), the mediating effects of process regulators and self-control behaviors on the relationships between contextual factors and eating styles were investigated in a two-step multiple mediator model (See Figure 4.14).

As expected, a series of hierarchical multiple regression analyses supported the roles of academic stress and resourcefulness as two-step mediators in the pathways from children’s satiety responsiveness/caregivers’ emotional eating (contextual factor) to children’s emotional eating (target behavior). Likewise, the roles of dispositional optimism and resourcefulness as two-step mediators in the pathways from the awareness of hunger and satiety cues (contextual factor) to emotional eating (target behavior) were supported. In other words, the influences of children’s satiety responsiveness/caregivers’ emotional eating on children’s emotional eating were mainly indirect; that is, the influence happened through the mediating process of academic stress and resourcefulness skills. Similarly, the influences of awareness of hunger/satiety cues on emotional eating were indirect as well, and this relationship was mediated by dispositional optimism and resourcefulness skills. That is, dispositional optimism and resourcefulness skills provide a
further explanation of the reason how and why children’s awareness of hunger/satiety cues was related to emotional eating.

Similarly, academic stress and resourcefulness were two-step mediators of the relationship between children’s satiety responsiveness and external eating and between caregivers’ emotional eating and children’s external eating. Likewise, dispositional optimism and resourcefulness had mediating effects on the relationship between hunger/satiety cues and external eating. In other words, the influences of children’s satiety responsiveness/caregivers’ emotional eating on children’s external eating were mediated by academic stress and resourcefulness skills. Similarly, the effect of awareness of hunger/satiety cues on external eating was indirect, i.e., through the mediators of dispositional optimism and resourcefulness skills. However, in this two-step mediator model, both academic stress and resourcefulness as well as dispositional optimism and resourcefulness could not mediate the effects of contextual factors on restrained eating because the essential criteria of testing mediation were not met.

To date, no published studies have examined resourcefulness and other indicators functioning together in a two-step mediator model. Thus, the current study’s results add to our understanding of the mechanism between a child’s intrinsic (i.e. satiety responsiveness and hunger/satiety cues) and extrinsic (i.e. caregiver’s emotional eating) contextual factors and target behavior -- eating styles (i.e. emotional and external); that is, a child’s academic stress/dispositional optimism and resourcefulness skills acted as two-step mediators to help strengthen the relationship. Most importantly, the findings from this study not only support the study model derived from resourcefulness theories (Rosenbaum, 1990; Zauszniewski, 2006) but also enrich the realization of the
relationship between contextual factors and target behavior, thereby demonstrating that the relationship between contextual factors and target behavior is mediated by process regulators and resourcefulness. Although the two-step mediator model tested in the study reported here did not provide consistent findings, integrated programs that aim to decrease academic stress first and later enhance resourcefulness may help to promote healthy eating styles. Likewise, children may benefit from participating in integrated programs aimed to first enhance their dispositional optimism and later increase their resourcefulness skills, ultimately culminating in the promotion of healthy eating styles.

Limitations

The current study had a number of methodological limitations. Hence, the findings of this study should be interpreted with some caution. Limitations and concerns are described in the following sections.

Study Design

The design for the current study was cross-sectional; therefore, it was not possible to assess the study variables over time and to determine causation of healthy eating patterns. Since studies that focused on children’s resourcefulness were few in number and limited in scope and the main purpose of this study was to explore the relationships among resourcefulness and eating behaviors among fifth and sixth graders in Taiwan, using a cross-sectional design yielded sufficient evidence to help expand the discussion of resourcefulness in pediatric populations and to set a foundation for designing individualized interventions that will benefit children and their families.
**Generalizability**

Another limitation of this study is the generalizability of the study findings. Although the current study aimed to increase the variability of participants by using a variety of recruiting strategies, with study participants recruited from the community and primary schools across three different metropolitan areas in Taiwan, the convenience sampling method may have provided a less representative sample from the population. In addition, all the participants were from the same cultural background, and child participants were within a restricted age range. Hence, the homogeneity of study participants with regard to age and ethnicity also limits the generalizability across populations. Thus, a greater ability to generalize findings would emerge from research including a more diverse sample with regard to age, SES, and cultural background in the children and their caregivers.

**Measurement**

Translation of the study measures is another limitation. Nine measures were used in the current study. Four of them, satiety responsiveness (SR), hunger/satiety cues (HSC), Children’s Dutch Eating Behavior Questionnaire (DEBQ-C), and Children’s Resourcefulness Scale (CRS), were translated from English into Mandarin Chinese with Traditional Chinese characters. Thus, the current study was the first time they were used in a Taiwanese population. Prior to this current study, the measures were translated following the well-established translation and back-translation model (Brislin, 1970) to meet the goal of translation and to assure their equivalence between the source and target versions (Behling & Law, 2000; Brislin, 1970).
Cronbach’s alpha of the original 10-item version (English) of CRS has been reported as .72 (Zauszniewski et al., 2010). Before using this scale for subsequent analyses, exploratory factor analysis (EFA) and reliability assessment were conducted in order to eliminate redundant items and generate a more parsimonious solution with stronger levels of internal consistency. Consequently, elimination of one problematic item improved the alpha coefficient of the CRS from .60 to .65. Lastly, the scale alpha was not improved with removal of any of the 9 items, and they were retained for subsequent analysis. The reliability coefficient for the 9-item Chinese-version CRS (alpha = .65) was marginally acceptable with rounding to one decimal place approximating the .7 criterion, as suggested by multiple researchers (DeVellis, 2003; Nunnally & Bernstein, 1994).

The problematic item in the current study describes how the child handles interruptions, which reflects the factor of problem-solving -- an important self-control dimension (reformative self-control) of resourcefulness. According to Rosenbaum (1990, 1993), problem-solving strategies are needed for individuals to overcome obstacles, delaying gratification, and adopt a new behavior. Problem-solving is the cognitive-behavioral process by which an individual attempts to identify or discover effective or adaptive solutions to stressful problems encountered in daily living (Nezu, 2002). Problem-solving involves a series of complicated steps, which usually include interpreting the problem, identifying goals in the problem-solving situation, exploring strategies for solving the problem, determining how to implement strategies, and evaluating the strategies’ effectiveness (Berg & Strough, 2011; Leventhal et al., 2003). In the present study, this problem-solving item failed to identify the ability to solve
problems among child participants. The reasons may be associated with key influencing factors on the performance of problem-solving, and include cognitive maturity, experiences (Berg & Strough, 2011; Bronson, 2000; Siegler, 2006), parent-child interactions, parenting (Landry, Smith, & Swank, 2006), peers (Azmitia, 1988; Fawcett & Garton, 2005), and culture (Berg & Strough, 2011; Bronson, 2000; Chang, 1998; Siegler, 2006).

Studies of the effects of cultural factors on individual’s decision-making and problem-solving are limited. Chang (1998) found significant cultural differences in problem-solving. In examining the differences in problem-solving between Asian Americans and Caucasian Americans, Chang (1998) found that Asian Americans were more likely to use dysfunctional problem-solving strategies than Caucasian Americans.

In relation to decision-making, one important attribute of problem-solving, Mau (2000) found that Taiwanese students were more likely than American students to adopt a dependent career decision-making style than did American students. Mau (2000) further concluded that the reason why Taiwanese students scored lower on career decision-making was because the collective-oriented culture, which may have influenced them to rely less on individual abilities than on group efforts.

One of important attribute of coping is problem-solving. Research has suggested that coping is associated with cultural contexts (Chang, 1998; Cole, Bruschi, & Tamang, 2002; Ol’ah, 1995). When examining the cultural differences in coping, Cole and associates (2002) found that U.S. school-aged children appeared to be more problem focused and action oriented when faced with difficult situations than children from Nepal. Likewise, Ol’ah (1995) examined coping strategies among adolescents from five
nationalities. The study found that adolescents in European countries more frequently reported assimilative coping strategies (action-based and problem-focused approaches) than adolescents in India and in Yemen, the latter preferred emotion-focused solutions (Ol’ah, 1995). Similarly, Chang (1998) found that Asian Americans used problem avoidance and social withdrawal strategies more often than Caucasian Americans did; that is, Asian Americans tended to use more disengagement types of coping strategies than Caucasian Americans. However, in this Chang’s (1998) study, no significant ethnic differences were found in the use of problem-solving, cognitive restructuring, or seeking social support.

Studies have indicated that individuals from a culture whose child-rearing practices encourage obedience in the child and conformance to parental authority are associated with the dependent cognitive style (Witkin, 1979). In relation to child-rearing, Jacobs and Eccles (1992) found that mothers’ perceptions of their children’s abilities have a great influence on children’s perception of their own abilities. Likewise, Wang and Tamis-LeMonda (2003) found that European-American mothers favored interdependence, compassion, and consideration, whereas Taiwanese mothers favored politeness, humility, getting along with others, and following social rules. Therefore, Asians had stronger concerns about making mistakes, parental expectations, parental criticism, and doubts about their actions when compared with Caucasians (Chang, 1998). Markus and Kitayama (1991) commented that American culture emphasizes attending to the self, the appreciation of one’s differences from other, and the importance of asserting the self; in contrast, Asian cultures have been known to foster a view of the person that maintains a fundamental relatedness of individuals to each other. Moreover, attending to
others, harmonious interdependence with them, and fitting in are not only valued but also are expected in Asian cultures (Cole et al., 2002; Markus & Kitayama, 1991; Yee, 1992).

Taiwan upholds traditional values from its strong collectivist roots (Lee & Sun, 1995). Additionally, Socialization of children in Taiwan has historically been in accordance with Confucian principles (Benjamin, Schnieder, Greenman, & Hum, 2001), which emphasize the importance of group interest, mutual dependence, interpersonal relationships, moderation, and harmony (Chiu, 1987; Fang, 1988; Lin & Tsai, 1996). Both families and schools in Taiwan impart these fundamental values to children through mutual reinforcement; hence, children in Taiwan are taught early on to conform to group expectations (Wilson, 1970). That is, the needs and interests of the group should take precedence over those of the individual (Lin & Tsai, 1996). For example, Benjamin and associates (2001) found that friends in Taiwan reported significantly less conflict in their relationships than did friends in Canada; in addition, the agreement among friends in Taiwan was greater than in Canada on the presence of conflict in the friendship relationship.

As a consequence, the reason that this particular item failed to identify the current child-sample’s ability to solve problem may further be due to the description of this item – using the strategy “ignore”, to ignore the persons who create the disruptions. Because ignoring or not paying attention may imply s/he is unsociable, not gregarious, and not fitting in. In addition, ignoring someone indicates that s/he tends to override the group interests, creates tension, breaks the harmonious balance of the relationship on purpose, and further fails to live up to others’ expectations.
While most literature has indicated .70 to be a benchmark for good internal consistency (DeVellis, 2003; Nunnally & Bernstein, 1994), lower thresholds are sometimes used in the literature with some explanations to support the lower score. It was suggested that measurements with lower internal consistency can still be valid under certain circumstances (Little, Lindenberger, & Nesselroade, 1999; Schmitt, 1996). As commented by Gherunpong and colleagues (2004), alpha tends to underestimate the reliability of a multidimensional scale and lower values can be expected from health-related measures. For example, scholars have suggested that an alpha less than .70 may remain useful and an alpha between .60 and .70 may be satisfactory for research measures in psychology (Aiken, 2000; Gregory, 2000). Furthermore, an acceptable coefficient alpha should depend on the purposes of the research questions (Nimon, Zientke, & Henson, 2012) and take the measurement’s dimensionality or construct validity into consideration (Schmitt, 1996). Kline (2000) stated that values below .70 can be expected when dealing with psychological constructs because of its diversity. Likewise, Tuckman and Harper (2012) stated that an alpha of .50 or greater is acceptable for assessing attitude tests.

In summary, although instruments devised for clinical purposes typically strive for greater levels of internal consistency, the consistency characterizing the scales used in the present study appears adequate for research purposes. The CRS has not been used widely in the Western world. Furthermore, it was translated into Mandarin Chinese from English and was first used in Taiwan, which is an Oriental culture and a non-English society (as presented in previous sections on cultural differences). Hence, results should
be interpreted with caution and further scale refinement with ethnically and racially diverse cultural background is necessarily recommended.

The 6-item Life Orientation Test-Revised (Chinese version) (CLOT-R) (Lai, 2003), includes three positively- (optimistic) and three negatively-phrased (pessimistic) items (Lai, 2003), was intended to measure a unidimensional construct of dispositional optimism, and was planned to measure both the children’s and caregivers’ dispositional optimism. After removing the problematic items by conducting the procedures of EFA and reliability assessment, two items of the pessimistic subscale were used to measure pessimism. As a result, the current study used different measures to assess individuals’ optimism and pessimism.

While conducting EFA of the CLOT-R, the two-factor solutions (optimism and pessimism) were identified for both versions (children and caregivers). This result was consistent with previous studies by using the CLOT-R in two groups of Chinese adults (Lai & Yue, 2000; Lai et al., 2005), indicating that the positively and negatively worded items of the CLOT-R may measure two different dimensions: optimism and pessimism, respectively. Furthermore, research also found that two factors of optimism and pessimism were identified by using other versions of LOT such as the original LOT (Chang & McBride-Chang, 1996; Chang et al., 1994) or the Revised LOT (LOT-R) (Creed, Patton, & Bartum, 2002; Herzberg, Glaesmer, & Hoyer, 2006; Kubzansky, Kubzansky, & Maselko, 2004). Hence, as suggested from other studies (Chang & McBride-Chang, 1996; Chang et al., 1994; Carver et al., 2009; Dember et al., 1989; Myers & Steed, 1999; Scheier & Carver, 1992; Wu, Lin et al., 2008), future research should use separate measures of optimism and pessimism, and researchers should use
caution when interpreting results. In addition, since the CLOT-R has not been tested widely in Taiwan and was only found in few published studies, further scale refinement is recommended.

**Study Implications**

Findings generated from this study not only contribute to an understanding of the interrelationships among academic stress, dispositional optimism, resourcefulness, and eating styles with a group of fifth and sixth graders in Taiwan but also provide rich and valuable information for the advancement of the nursing discipline including clinical practices, health policy, theory development, and nursing education, that will enhance a healthy lifestyle in children and their families.

**Clinical Practice**

Childhood overweight and obesity are a critical health issue not only because of their association with current physical, psychosocial, and social-economic issues but also because of an increased risk of adulthood obesity and chronic diseases. In the current study, over one quarter (26.24%) of the child participants was overweight or obese. Considering the crucial impact on health by overweight and obesity, nurses and health professionals should first recognize the serious prognosis of overweight and obesity in all settings and situations in which children and families receive health care and support. Understanding the inter-relationships among the study variables allows nurses and health professionals to implement effective prevention activities and help children develop healthy eating styles and maintain an ideal body weight.

Significant results from the current study not only showed the interrelationships among the intrinsic contextual factors (e.g. satiety responsiveness and hunger/satiety
cues), academic stress, dispositional optimism, resourcefulness skills, and eating styles but also supported the effects of the intrinsic contextual factors (e.g. satiety responsiveness and hunger/satiety cues) on academic stress/dispositional optimism, resourcefulness skills, and eating styles. Therefore, health professionals should assess and evaluate these indicators discreetly because they might lead to dysfunctional eating styles (i.e. emotional or external eating styles), which may be related to overweight and obesity and would have deleterious consequences for their patients’ health.

The findings from the current study also demonstrated the interrelationships among the extrinsic contextual factor (caregivers’ emotional eating), academic stress, dispositional optimism, resourcefulness skills, and eating styles; in addition, the extrinsic contextual factor (caregivers’ emotional eating) had effects on academic stress/dispositional optimism, resourcefulness skills, and eating styles. Including caregivers’ variables in the analysis was one of the merits of the current study in that it reflected the philosophy of family-centered care (FCC).

Pediatric care has adopted the philosophy of an FCC approach in order to maximize the well-being of pediatric populations. Family is particularly important to the health of children not only because it is the constant in a child’s life but also the child’s primary source of strength and support; in fact, all members of the family are concerned with a child’s health conditions. Given the vital roles that caregivers play and that they assume primary responsibility for the care, feeding, and education of children, including the transmission of shared cultural understandings between caregivers and children and the beliefs that caregivers possess with respect to their own eating styles, understanding the complexity of those relationships has critical implications for their perception of and
response to the eating styles of their children. Therefore, nurses must work with the caregivers and families to develop the best plan of care for a child. Consequently, not only the child but the caregivers and families can benefit from the plan.

Furthermore, the findings from this study supported the mediating role played by academic stress/dispositional optimism on the relationships between contextual factors (i.e. satiety responsiveness and hunger/satiety cues) and resourcefulness skills as well as the mediating role of resourcefulness skills on the relationships between academic stress/dispositional optimism and eating styles (i.e. emotional and external eating). These findings provide a great resource for nurses and health professionals to design tailored interventions for decreasing academic stress or enhancing dispositional optimism in order to promote resourcefulness skills. Likewise, an individualized intervention program focusing on enhancing resourcefulness skills could be planned for adjusting better to their eating styles and then maintaining ideal body weight.

Moreover, the study reported here found that academic stress and resourcefulness skills together had mediating roles on the relationships between contextual factors and eating styles in children and that dispositional optimism and resourcefulness skills also mediated those relationships. Hence, in addition to an individualized intervention, the nurses could create an integrated intervention program that combines stress-reducing and/or optimism-enhancing together with resourcefulness-training could be put into practice as well. That is, nurses could implement this integrated intervention program and facilitate the tailoring of interventions based on the individualized needs of children and their families.
In summary, prevention is better than cure. It is worthwhile and rewarding to put early investment in the health of children because many health conditions can be prevented with health-promoting programs, and childhood is the most advantageous time in human life to promote healthy behaviors and prevent health problems. The findings from this study provide a sound foundation for future interventional approaches. Identifying possible precursors to excess weight gain (e.g. stress and eating styles) and understanding their relationships can help nurses and health professionals to detect potential mental and physical health issues in advance and to design effective interventions at an early age before people become overweight and obesity develops. Nurses can play an independent, essential role at this critical period in the lifespan and put children on a healthy track at the early stages of their lives.

Health Policy

“An ounce of prevention is worth a pound of cure”, and enhancing children’s ability to have self-control skills and to maintain healthy eating styles can have an immeasurable impact on their health and related costs throughout their lives. The causes of childhood overweight and obesity are multifactorial and complex; additionally, the difficulties in treating overweight and obesity as well as maintaining healthy weight are well known. The results of the current study provide a comprehensive understanding from a different perspective on the issues of childhood overweight and obesity and the relationships among key factors in fifth and sixth graders. By applying the results from this study, possible triggers of childhood overweight and obesity may be identified, and subsequent appropriate prevention could be implemented. Hence, this study’s findings could contribute to a stronger, more proactive health policy.
The current study supports the idea that stress may be an important trigger of dysfunctional eating through its deleterious effects on resourcefulness skills; likewise, optimism may be an important protective factor for healthy eating and its effect could be made greater through increased resourcefulness skills. Hence, it is necessary to consistently evaluate children’s eating styles, perceived stress, dispositional optimism, and resourcefulness skills.

Moreover, providing appropriate intervention programs such as stress-reducing, optimism-enhancing, or resourcefulness-promoting programs is needed, especially at school. School is an important context in which to deliver interventions, and health promotion activities at schools are most likely to be effective (Chu, 2001). Hence, school authorities, teachers, school dietitians/nutritionists, and school nurses have to recognize the important impact and consequences of childhood overweight and obesity. Considering the high prevalence of childhood overweight and obesity, school authorities should welcome these health promotion intervention programs onto their campuses and coordinate with school personnel to provide these programs to children and their families on a regular basis. In other words, school authorities have the obligation to increase the accessibility of health services when making related policies.

Health professionals should always keep prevention in practice. Therefore, while current policy strategies aim to decrease unhealthy food consumption and to increase an active lifestyle in order to reduce childhood overweight and obesity, these policies may be more effective if there are plans/programs that first focus on assessing children’s eating styles and other individual factors (e.g. academic stress, dispositional optimism, and resourcefulness skills) as well as ways that could compensate for increases in mental health.
disruptions (e.g. stress) and strengthen the levels of positive psychosocial factors (e.g. resourcefulness) among schoolchildren. For this reason, educational/school authorities and health policymakers should pay more attention to prevention and implement the evidence-based recommendations from the current study for screening identified risk factors and employ appropriate interventions to promote healthy eating and, ultimately, maintain a healthy BMI status and prevent the development of overweight and obesity.

**Theory Development**

Results from this study helped to support the testability and usefulness of a theoretical framework, which was derived from Rosenbaum’s (1990) theory of learned resourcefulness and Zauszniewski’s (2006) middle-range theory of resourcefulness and QOL. The findings suggested significant interrelationships among intrinsic (e.g. satiety responsiveness)/extrinsic (e.g. caregivers’ emotional eating) contextual factors, process regulators (e.g. academic stress and dispositional optimism), self-control behaviors (resourcefulness skills), and target behavior (eating styles -- emotional, external, and restrained). In addition, this study’s finding have provided an integrated and comprehensive understanding of the phenomenon in terms of the mediating roles of process regulators (e.g. academic stress) on the relationship between contextual factors (e.g. satiety responsiveness) and self-control behavior, the mediating role of self-control behavior on the relationship between process regulators (e.g. academic stress) and target behaviors (e.g. emotional eating), and the mediating roles played by process regulators and self-control behavior (e.g. academic stress and resourcefulness) on the relationship between contextual factors (e.g. satiety responsiveness) and eating styles (e.g. emotional eating).
Although most studies have focused on adults’ resourcefulness and their related findings are well-documented, the findings from the study reported here extend the body of knowledge of resourcefulness to pediatric populations. As a result, this study contributes to the advancement of nursing knowledge and helps to bridge the gaps among the studies related to children’s overweight/obesity, eating styles, resourcefulness skills, and other identified study variables.

**Nursing Education**

In order to improve the quality of nursing care and promote nursing professional and scientific identity, nursing education, clinical practice, theory, research, and health policy should be communicated reciprocally. It should be noted that health promotion, disease prevention, and health maintenance have the same contribution to an individual’s QOL. Hence, while nursing curricula mostly focus on an individual’s deficits across lifespan, results from this study provide valuable information from a different perspective in terms of examining both positive- and negative aspects of one’s inner self, which are equally important when assessing an individual’s overall health. In addition, children are not small adults; therefore, from the perspective of normal child development, it is beneficial for children to examine their positive enabling attributes such as resourcefulness skills in order to facilitate their development and enhance their ability to handle challenges in life successfully.

The findings from this study can be incorporated into nursing education in both nursing curricula and continuing nursing education. Furthermore, nursing education should emphasize the independent and unique role of nurses that nurses have the ability
to assess a child’s and his/her family’s challenges and assets from a strength-building approach in addition to an approach from the perspective of pathology and deficits.

**Recommendations**

The present study was the first to apply resourcefulness theories in a study of fifth- and sixth-grade children in Taiwan. The findings provide a sound foundation for future research.

**Future Research**

In order to increase generalizability, future studies may focus on obtaining adequate sample size and designing alternative research approaches within diverse settings, locations, and pediatric populations.

**Target participants and settings.** Recommendations for future research include recruiting children from different age groups such as middle school children or high school children and comparing key variables among different age groups. The current study focused on fifth and sixth graders and their caregivers. Because of the Chinese cultural view on the importance of academic achievement, most parents place high expectation on their children’s academic achievement (Chang et al., 1993; Leung et al., 2010; Levine & Munsch, 2011; M. Wu, 2006). In addition to the current education/school system and the possible perceived stress that related to examinations for various types of admission programs in Taiwan, academic stress is hypothetically considered to be higher in middle and high school children. Furthermore, inconsistent relationships have been found between age and different eating styles (emotional, external, and restrained eating); hence, such studies would be helpful to address the gap.
Participants in the current study were recruited from primary schools and their surrounding communities, so the weight status was mixed. Future studies will also need to target the participants with the same weight status (i.e. overweight or obese groups); for example, to recruit children and their families from clinical sites (e.g. obesity clinics). Therefore, the dysfunctional eating styles might be more prevalent and more easily be detected. Additionally, a comparison among groups of normal weight, overweight, and obese could be examined. Moreover, comparing children with different caregivers (e.g. mother, father, and grandparents) could be conducted once adequate sample sizes for each group are reached.

Research shows that relationships among BMI, SES, and eating styles have not been consistent. Hence, examining the variables of interest in different locations (e.g. rural and urban areas) would allow for comparisons and clarification of their relationships among them.

Lastly, studies on children’s resourcefulness with different chronic health conditions (e.g. cancer, asthma, or diabetes) in diverse settings (e.g. inpatient settings or outpatient clinics) are also recommended in order to expand the knowledge of children’s resourcefulness. In addition, since the current study was conducted in Taiwan only and studies on children’s resourcefulness are limited, studies with participants recruited from different cultural/ethnic backgrounds are also recommended. Thus, comparisons of results across different cultural/ethnic backgrounds could be made.

**Research designs.** Children who have rapid weight gain during their transition into adolescence will have poor health outcomes in adulthood (Baker et al., 2007; Barker et al., 2005; Bhargava et al., 2004; Dietz, 2004). Since the current study used a cross-
sectional design, a longitudinal design with more measurement points over time (e.g. at the beginnings and ends of middle school and high school) is strongly recommended in order to observe the changes of the study variables over time and to determine the causal direction of the variables of interest.

In addition, a qualitative study of the resourcefulness among children is suggested for exploring their experiences of resourcefulness skills when facing difficulties, which may include experiences of positive self-instruction, delay of gratification, problem-solving, help-seeking, and the sense of self-efficacy. It is expected that information obtained from this qualitative approach may help in the refinement of current available instruments.

As described throughout this chapter, another direction for future research based on these study findings is to develop and design interventions that will address the needs of this population. Interventions will target the child’s academic stress, dispositional optimism, and/or resourcefulness. The goal of these interventions is to help the child to reframe his/her situation and have a healthy life. Furthermore, follow-up studies can also be conducted in order to evaluate the effectiveness of such intervention programs.

It is highly recommended to team up with different disciplinary professionals, such as physicians and exercise expert, in order to enable the effective assessment and coordination of issues related to eating styles and obesity. For example, physical activity can be another direction of intervention program because increasing physical activity will improve an individual’s metabolic rate and psychological well-being (Nowicka & Flodmark, 2006). While studies have found that individuals’ with stronger resourcefulness capacity were more successful in maintaining exercise involvement and
staying in exercise programs when compared with their counterparts (Kennett & Ackerman, 1995; Kennett, Worth et al., 2009; Levesque et al., 2003). Hence, interventions that focusing on increasing physical activity will be absolutely necessary in future studies especially for the groups that have been identified as having high tendency toward unhealthy eating styles and having risk of being overweight and obesity.

**Study variables.** Since parenting may play a key role in shaping children’s dispositional optimism, resourcefulness, and eating styles, variables related to parenting (e.g. parenting styles, parenting behaviors, parental feeding styles, parenting resourcefulness, or perceived parental rearing style) may be used in future studies. It is expected that these parenting-related variables may be able to provide more explanations regarding the interrelationships among certain variables used in the current study.

Studies on stress in children are limited. Since school-age children should have the ability to discuss their stressors (Ryan-Wenger et al., 2005), adding instruments to measure children’s stressors or sources of stress may provide further information about the relationships among variables of interest.

In addition, stress may have a negative effect on mental health. Individuals may become anxious or depressed when they feel stressed. Moreover, mood regulation may become dysfunctional because of stress and dysfunctional mood regulation can cause overeating (Thayer, 2001). Hence, variables such as anxiety or depression should be considered in future studies.

**Psychometric properties of measurement.** Re-examination of the psychometric properties of the measures used in the current study is recommended. Four of these measurements, satiety responsiveness (SR), hunger/satiety cues (HSC), Children’s Dutch...
Eating Behavior Questionnaire (DEBQ-C), and Children’s Resourcefulness Scale (CRS), were translated into Mandarin Chinese with Traditional Chinese characters from English for this study, and were used for the first time in this study of Taiwanese children and their caregivers. Hence, further scale refinement and psychometric testing may be needed.

**Plans for Dissemination**

Dissemination of research findings is critical to improve health and the health system through expanding individual awareness and promoting behavioral changes. Dissemination of the research findings can be achieved through presentations in academic/research conferences and seminars (e.g. Midwest Nursing Research Society Annual Research Conference or Sigma Theta Tau International Honor Society of Nursing Biennial Convention) as well as publishing research manuscripts in peer-reviewed academic/professional journals (e.g. Appetite, Archives of Psychiatric Nursing, Eating Behaviors, International Journal of Nursing Studies, Journal of Advanced Nursing, Journal of Clinical Nursing, or Research in Nursing & Health). While the target audience is the general public, dissemination can be achieved through workshops, flyers, and editorials; in addition, the messages or findings can be specially tailored in a succinct manner for people not in the health profession.

**Plans for Secondary Analysis**

Plans for secondary analysis include (1) examining the predictors of each of the eating styles and higher BMI, (2) investigating the differences in eating styles among normal-weight, overweight, and obese children, (3) testing the moderating functions of process regulators (e.g. dispositional optimism) on the relationship between contextual factors and resourcefulness as well as between contextual factors and each of the eating
styles, (4) investigating the moderating effects of resourcefulness on the relationship between process regulators and eating styles as well as between contextual factors and eating styles, (5) examining the total effects of certain contextual factors on each eating style with a path analytic approach, (6) validating the Chinese versions of the Children’s Dutch Eating Behavior Questionnaire (DEBQ-C), Children’s Resourcefulness Scale (CRS), Dutch Eating Behavior Questionnaire (DEBQ), and Life Orientation Test-Revised (CLOT-R) in the Taiwanese population.

**Conclusion**

This is the first quantitative study that applied Rosenbaum’s (1990) theory of learned resourcefulness and Zauszniewski’s (2006) middle-range theory of resourcefulness and QOL to examine the relationships among resourcefulness, academic stress, dispositional optimism, and eating styles among 368 dyads consisting of fifth and sixth graders and their caregivers in Taiwan. The mediating functions of academic stress, dispositional optimism, and resourcefulness also suggested directions for clinical practices and future intervention studies.

“Helping children to help themselves” (Ronen & Rosenbaum, 2001, p. 338) is the philosophy for pursuing a comprehensive understanding of children’s resourcefulness. Continuing with healthy eating styles in order to keep an ideal body weight is important because it would be difficult to reduce excessive weight once it becomes established. Children should therefore be considered the priority population for intervention strategies. Therefore, with an increasing prevalence of childhood overweight and obesity and related possibly toxic consequences, resourcefulness is needed for overcoming disturbing emotions, learning the cause for their behaviors, and acquiring effective techniques and
skills for behavioral change, especially in the scenario of maintaining healthy eating styles. It is believed that children show increasing awareness of the strategies that facilitate various types of resourcefulness skills as they grow up; therefore, health professionals should seize opportunities for interventions that can change the course of a child’s development before difficulties in having or maintaining self-control become persistent. The findings from current study provide a foundation from a different angle for designing future resourcefulness training program, which is a promising and effective technique that children can benefit from it and use to face life challenges in positive ways, solve their problems, pursue their goals, and most importantly achieve a better quality of life.
Permission Agreement

I hereby acknowledge that I have the right to grant the permission requested in this agreement. I grant the permission to Ya-Fen Wang to conduct her project at Taichung Municipal Li Sing Elementary School (name of the school) between the time periods of December 2011 and March 2012.

Regards,

Hsieh Wei-Cheng / Principal
(print name and position/title)

Date: 2011/10/20

No.223, Jinhua Rd., East Dist., Taichung City 401, Taiwan (R.O.C.)
(school address)

886423604412 / lxes@lxes.tc.edu.tw (phone / email)
Permission Agreement

I hereby acknowledge that I have the right to grant the permission requested in this agreement. I grant the permission to Ya-Fen Wang to conduct her project at Pei-Ying Primary School (name of the school) between the time periods of December 2011 and March 2012.

Regards,

彭化學和美鎮培英國小校長
(print name and position/title)

[Signature]

Date: 2011-12-02

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APPENDIX B

INFORMED CONSENT DOCUMENTS

INFORMED CONSENT DOCUMENT
Parental Permission

Resourcefulness, Academic Stress, Dispositional Optimism, and Eating Styles among Fifth and Sixth Graders

You and your child are being asked to participate in a research study about examining the relationship between academic stress in fifth and sixth graders. You were chosen as a possible participant because you are the primary caregiver of a fifth or sixth grader. Your child was chosen as a possible participant because he or she is a fifth or sixth grader. Please read this form and ask any questions that you may have before agreeing to be in the research.

Researchers at Case Western Reserve University are conducting this study.

Background Information
The health of children is a resource for many future aspects of development in all countries no matter their backgrounds are. Being overweight or obese will have a variety of adverse physical, psychological, and economic consequences. Unhealthy eating styles are easily to be induced by stress and are related to overweight and obesity. The purpose of this research is to find out whether academic stress is associated with eating styles in fifth and sixth graders.

Procedures
If you agree to be a participant in this research and agree your child to participate in this research, we would ask you and your child to do the following thing:
1. Agree to participate in the study by signing this form.
2. Agree to complete the study questionnaire. The 81-item questionnaire will take less than 30-minutes of your time.
3. After you agree your child’s participation by signing this form, your child will need to sign the child assent at home to indicate his/her agreement to participate in the study. Your child has the choice to refuse to participate in the study. If your child is willing to participate in the study, he or she will be asked to complete the child’s questionnaire in class. This 72-item questionnaire will take less than 30-minutes of his or her time.

Risks and Benefits to Being in the Study
There are no foreseeable risks, physical, psychological, social, or legal, in this study. Related studies with similar questionnaires show that study participants have not been harmed by any physical or psychological discomfort. However, if you or your child feels distressed during completing the questionnaire, you can stop doing it immediately. In addition, both you and your child have the right to withdraw from the study at any time. Your participation or non-participation will not affect both you and your child’s relationships with homeroom teachers, peers, grades, or student status in the school.

You or your child doesn’t have to pay anything in taking part in this study. Although there is no direct benefit for being in the study, the possible benefit is expected. Both you and your child would get the opportunity to review your characteristics and/or abilities on handling stressful events and your own eating styles through completion the questionnaire. In addition, you will be provided a brief study finding after the data analysis is completed. It may be beneficial for you to know how you, your child, and other children do within the similar circumstances.

Compensation
Your child will receive a gift ($2) as a compensation for his or her time after completing the questionnaire. Your child’s class will also get a book gift card ($15).
Confidentiality
The records of this research will be kept private. In any sort of report we might publish, we will not include any information that will make it possible to identify you or your child. The questionnaires will not contain names or any information that make it possible to identify you or your child, and will be kept in a locked file. The access will be limited to the researchers, the University review board responsible for protecting human participants, regulatory agencies, and sponsors and funding agencies. However, you and/or the homeroom teacher will be informed if it is found that your child is under a lot of academic stress and has extreme eating styles. In addition, if it is suspected that the child has been a victim of any type of abuse or neglect, or is in danger to him/herself or others, then the appropriate agencies will need to be notified.

Voluntary Nature of the Study
Both you and your child’s participation are voluntary. If you choose not to participate, it will not affect you and your child’s current or future relations with the school, teacher, or with any community resources or services that you need. There is no penalty or loss of benefits for not participating or for discontinuing your participation. However, your child will only get the incentives after both you and your child have finished the questionnaire completely.

Contacts and Questions
The researchers conducting this study are Dr. Jaclene A. Zauszniewski and Yu-Fen Wang. You may ask any questions you have now. If you have any additional questions, concerns or complaints about the study, you may contact them at (440) 681-8325 (US) or 0910-428232 (TW) or email yxw29@case.edu.

If the researchers cannot be reached, or if you would like to talk to someone other than the researcher(s) about; (1) questions, concerns or complaints regarding this study, (2) research participant rights, (3) research-related injuries, or (4) other human subjects issues, please contact Case Western Reserve University’s Institutional Review Board at (216) 368-6925 or write: Case Western Reserve University; Institutional Review Board; 10900 Euclid Ave.; Cleveland, OH 44106-7230.

You will be given a copy of this form for your records.

Statement of Consent
I have read the above information. I have received answers to the questions I have asked. I give consent for my child to participate in the above research.

Name of Child: __________________________________________

Signature of Parent or Guardian: ____________________________ Date: ____________

Person Obtaining Consent: ____________________________________
INFORMED CONSENT DOCUMENT

Child Assent

Resourcefulness, Academic Stress, Dispositional Optimism, and Eating Styles among Fifth and Sixth Graders

You are being asked to participate in a research study about examining the relationships between academic stress and eating styles in Fifth and Sixth Graders. You were chosen as a possible participant because you are a fifth or sixth grader. Please read this form and ask any questions that you may have before agreeing to be in the research.

Researchers at Case Western Reserve University are conducting this study.

Background Information
Your health is an important resource for many future aspects of development in your family and our country. Overeating styles are easily to be induced by stress and are related to overweight and obesity. The purpose of this research is to find out whether academic stress is associated with eating styles in fifth and sixth graders.

Procedures
If you agree to be a participant in this research, we would ask you to do the following thing:
1. Agree to participate in this study by signing this assent.
2. Complete the study questionnaire. The 72-item questionnaire will take less than 30-minutes of your time.

Risks and Benefits to Being in the Study
There are no foreseeable risks, physical, psychological, social, or legal, in this study. Related studies with similar questionnaires show that study participants have not been through any physical or psychological discomfort. However, if you feel distressed during completing the questionnaire, you can stop doing it immediately. In addition, you have the right to withdraw from the study at any time. Your participation or non-participation will not affect your relationships with homeroom teachers, peers, grades, or student status in the school.

You don’t have to pay anything in taking part in this study. Although there is no direct benefit for being in the study, the possible benefit is expected. You would get the opportunity to review your characteristics and/or abilities on handling stressful events and your own eating styles through completion the questionnaire. In addition, you will be provided a brief study finding after this study is completed. The individualized result will be available upon request if you are interested in obtaining it. It may be beneficial for you to know how you and other children do within the similar circumstances.

Compensation
You will receive a gift ($2) as a compensation for your time after completing the questionnaire. Your class will also get a book gift card ($15).

Confidentiality
The records of this research will be kept private. In any sort of report we might publish, we will not include any information that will make it possible to identify you. The questionnaires will not contain names or any information that make it possible to identify you, and will be kept in a locked file. The access will be limited to the researchers, the University review board responsible for protecting human participants, regulatory agencies, and sponsors and funding agencies. However, the you caregivers and/or the homeroom teacher will be informed if it is found that you are under a lot of academic stress and have extreme eating styles. In addition, if it is suspected that you have been a victim of any type of abuse or neglect, or is in danger to yourself or others, then the appropriate agencies will need to be notified.
Voluntary Nature of the Study
Your participation is voluntary. If you choose not to participate, it will not affect your current or future relations with the school, teacher, or with any community resources or services that you need. There is no penalty or loss of benefits for not participating or for discontinuing your participation. However, you will only get the incentives after you have finished the questionnaire completely.

Contacts and Questions
The researchers conducting this study are Dr. Jaclene A. Zauszniewski and Ya-Fen Wang. You may ask any questions you have now. If you have any additional questions, concerns or complaints about the study, you may contact them at (440) 681-8325 (US) or 0910-428232 (TW) or email yxw29@case.edu.

If the researchers cannot be reached, or if you would like to talk to someone other than the researcher(s) about; (1) questions, concerns or complaints regarding this study, (2) research participant rights, (3) research-related injuries, or (4) other human subjects issues, please contact Case Western Reserve University’s Institutional Review Board at (216) 368-6923 or write: Case Western Reserve University; Institutional Review Board; 10900 Euclid Ave., Cleveland, OH 44106-7230.

You will be given a copy of this form for your records.

Statement of Consent
I have read the above information. I have received answers to the questions I have asked. I consent to participate in this research.

Print Your Name: ________________________________

Signature of Participant: __________________________ Date: ______________

Person Obtaining Consent: ________________________ Date: ______________
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359


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