Children's coping after psychological stress. Choices among food, physical activity, and television

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Abstract
Children's stress-coping behaviors and their determinants have not been widely studied. Some children eat more after stress and dietary restraint moderates stress eating in youth, but eating has been studied in isolation of other coping behaviors. Children may not choose to eat when stressed if other behavioral alternatives are available. The purpose was to determine individual difference factors that moderate the duration of stress coping choices and to determine if stress-induced eating in youth persists when other stress coping behaviors are available. Thirty children (8–12 years) completed a speech stressor on one day and read magazines on another day. They completed a free-choice period with access to food, TV, and physical activity on both days. Dietary restraint moderated changes in time spent eating and energy consumed from the control to stress day. Children high in restraint increased their energy intake on the stress day. Changes in the time spent watching TV were moderated by usual TV time, as children higher in usual TV increased their TV time after stress. Thus, dietary restrained children eat more when stressed when other common stress coping behaviors are freely available. These results extend the external validity of laboratory studies of stress-induced eating.

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dampen the effect of stressors on stress reactivity in children (Roemmich, Lambiase, Salvy, & Horvath, 2009; Lambiase, Barry, & Roemmich, 2010).

It is unclear which coping behaviors children choose to engage in after interpersonal stress because previous stress research has focused on studying eating or physical activity/sedentary behaviors as singular coping options. To the best of our knowledge, no controlled laboratory study has presented children with a free choice of the three primary coping behaviors of eating, watching television, and exercising to assess how they choose to cope after experiencing an interpersonal stressor. Providing free access to a greater number of behavioral coping alternatives would provide for a stronger test of the external validity of the dietary restraint-stress induced eating relationship in children. Thus, the aims were to determine which of the behaviors were used for the longest duration to cope with interpersonal stress, to determine whether there are individual difference factors that predict how much time children allocate to stress coping behaviors, and to determine whether the effect of stress on energy intake in those children high in dietary restraint remains when other coping choices are available.

Research design and methods

Participants

Participants included 30 children (n = 15 boys, n = 15 girls) 8–12 years. All children met the entry criteria of having a body mass index (BMI) greater than the 5th percentile, having no history of diagnosed psychiatric disorder, no current illness or pregnancy, no current medication use, had no conditions that would alter baseline stress, stress reactivity, hunger, or appetite, and had no limitations to participation in physical activity. Current medical problems, including conditions or medications that may affect stress reactivity were assessed by phone screen. Socioeconomic level was assessed by the parent completing a standardized questionnaire (Hollingshead, 1975). The University at Buffalo Social and Behavioral Sciences Institutional Review Board approved the study. Parents provided written informed consent and children provided assent to participate in the study.

Experimental design and research procedures

The study was a within-subjects design. Children were studied during a control reading condition and an experimental speech condition. The conditions were completed on separate days; separated by at least two days, and the order of conditions was counterbalanced across all subjects. All children first completed an introductory lab visit.

Lab visit 1

At the start of the introductory visit, as part of the consenting process, the researcher went through the study design with the participant and their parent, emphasizing that they would be giving a speech on one day and reading magazines on the other day, and would have time to play on both days. Children then completed a 24-h dietary recall to help establish a usual level of energy intake. The children were told they could only participate in one activity at a time. An investigator sat in a control room and observed the child in the study room using a closed circuit video camera. The children were told that they could do any of the activities that they wanted to and could switch between the activities as many times as they wanted, but that they could only participate in one activity at a time. An investigator sat in a control room and observed the child in the study room using a closed circuit video camera and recorded into a spreadsheet the amount of time the child spent in each activity. All unconsumed food was measured. Children reported perceived stress and hunger using 10-point Likert scales throughout both conditions.

At the end of the third visit, the child’s height and weight were measured. The child also was asked to complete a modified version of the Dutch Eating Behavior Questionnaire (DEBQ) to assess dietary restraint, and complete a 7-day physical activity recall to establish usual physical activity.

Measurements

Anthropometrics and body composition

Body weight was measured to the nearest 0.01 kg with the subjects wearing light clothing. Height was measured with a stadiometer. Body mass index was calculated according to the following formula: \( \text{BMI} = \frac{\text{kg}}{\text{m}^2} \). Age- and sex-specific BMI z-scores were calculated using the Centers for Disease Control and Prevention growth reference standards (Kuczmarski et al., 2000).

Food and energy intake

Total energy and grams of food consumed were measured using information provided on the food label and a calibrated food scale to the nearest 0.01 g. Usual dietary intake information from the dietary recalls was entered and analyzed using Nutritionist Pro (v.2.2, Axxys Systems). Energy intake rate, measured for both the control day and the stress day, was determined by dividing the
total number of kcal consumed that day by the length of time the child spent eating. It describes the number of kcal consumed per second spent eating.

**Usual physical activity**

Usual physical activity was measured using a seven-day physical activity recall (Sallis, 1997). Children were interviewed to recall the time spent in sleep (1 MET), moderate (4 METs, as strenuous as walking), hard (6 METs, an intensity between walking and running) and very hard (10 METs, as strenuous as running) activities.

**Usual television time**

Usual television time was measured during the phone screen by asking parents to report the number of hours of television their child watches during a typical week.

**Dietary restraint**

Dietary restraint was measured using a version of the Dutch Eating Behavior Questionnaire (DEBQ) modified for use in youth (Hill & Pallin, 1998). The modified DEBQ contains fewer questions than the original, and has been modified so that children can better understand them. The response format is as follows: never, sometimes, and very often. Validity of the modified DEBQ has been demonstrated by significant inverse correlations with self-worth, physical appearance, social acceptance, body shape dissatisfaction, and body esteem (Hill & Pallin, 1998).

**Blood pressure**

Blood pressure (BP) was measured with a SunTech Tango monitor (Morrisville, North Carolina). The SunTech monitor uses the auscultatory method aided by electrocardiographic R-wave gating, and an oscillometric transducer to determine systolic (SBP) and diastolic (DBP) blood pressure and is a valid and reliable measure of BP during rest and exercise (Taylor & Gallen, 1994). Measurement of BP followed published guidelines (Shapiro et al., 1996) regarding cuff length and width, placement of the cuff around the arm 2.5 cm above the antecubital space, and seating of the cuff on the arm by inflating and deflating the cuff before taking any measurements.

**Analytic plan**

As a manipulation check, mean differences in SBP and perceived stress were tested using repeated measure analysis of variance (ANOVA) models with condition (control, stress) and protocol stage treated as within subjects variables. Differences in time spent in the three coping activities during the free choice period across the control and stress days were tested with repeated measure ANOVA with condition (control, stress) and protocol stage treated as within subjects variables. Differences in time spent eating, watching television, and physically active coping alternatives of the participants.

Sequential regression models were developed to test the moderating effects of dietary restraint on stress-induced eating, usual television watching on stress-induced sedentary behaviors, and usual physical activity on stress-induced physical activity. The change in energy intake or time, calculated as the energy intake or time on the stress day minus the energy intake or time on the control day, was used as the dependent variable. Single variables or groups of predictor variables were added in steps. For the models predicting change in eating behavior after psychological stress, energy intake rate (kcal/s) was included in step 1 because children who eat faster may eat for a shorter amount of time (Hill & McCutcheon, 1984). The main effects of stress reactivity and dietary restraint were then entered together as a second step, and the interaction of stress reactivity and dietary restraint was tested as a third step. For the model predicting change in sedentary behavior after stress, the main effects of usual sedentary time

**Table 1**

Demographics, usual eating, television and physical activity, and liking of the food, TV, and physically active coping alternatives of the participants.

<table>
<thead>
<tr>
<th>Demographic/Behavioral Measure</th>
<th>Participants (n = 30)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (y)</td>
<td>9.8 ± 1.3</td>
</tr>
<tr>
<td>BMI z-score</td>
<td>0.4 ± 1.2</td>
</tr>
<tr>
<td>Energy intake (kcal/d)</td>
<td>2031 ± 376</td>
</tr>
<tr>
<td>TV viewing (hr/wk)</td>
<td>11.4 ± 11.2</td>
</tr>
<tr>
<td>Hard physical activity (h/d)</td>
<td>0.8 ± 0.8</td>
</tr>
<tr>
<td>Total physical activity (h/d)</td>
<td>11.6 ± 1.4</td>
</tr>
<tr>
<td>Dietary restraint</td>
<td>4.9 ± 2.6</td>
</tr>
<tr>
<td>Hunger (control day)</td>
<td>4.7 ± 2.5</td>
</tr>
<tr>
<td>Hunger (stress day)</td>
<td>5.0 ± 2.6</td>
</tr>
<tr>
<td>Liking of food</td>
<td>9.3 ± 0.9</td>
</tr>
<tr>
<td>Liking of TV</td>
<td>9.2 ± 1.1</td>
</tr>
<tr>
<td>Liking of physical activity</td>
<td>9.0 ± 1.2</td>
</tr>
</tbody>
</table>

Data are mean ± SD. Dietary restraint scores are on a scale from 0 to 12. A higher score represents higher dietary restraint. Hunger scores represent baseline hunger after the preload and are on a scale from 1 to 10. Higher scores indicate greater hunger. Hard activity: activity of an intensity between walking and running. Total physical activity: the sum of moderate (walking), hard and very hard (running) activities. Liking scores are on a Likert scale of 1–10 and represent preferred choice. A higher score indicates greater liking.

![Fig. 1. Systolic blood pressure and psychological stress reactivity during the control and stress days.](image)

Like letters a, b, and c denote significant differences across protocol stages after adjusting for multiple comparisons. a < b < c.
and stress reactivity were tested in step 1 and their interaction in step 2. For the model predicting change in physical activity, the main effects of usual activity and stress reactivity were tested in step 1 and their interaction in step 2. Usual hard physical activity was chosen to reflect exercise, rather than total physical activity because hard activity is likely to be a better indicator of a child’s enjoyment of physical activity. The significance of the incremental increase in \( R^2 \) was tested at each step for each model. Confidence intervals were also calculated for the incremental increase in \( R^2 \) of each step (Steiger and Fouladi, 1992; Wuensch, 2012). Significant interaction effects, which demonstrate statistical moderation, are shown graphically in Fig. 2. Sex was not a significant predictor and was not included in any of the final regression models.

Results

Demographics, usual energy intake, television time, and physical activity, and liking of the activities of the combined sample of boys and girls are shown in Table 1. Based on CDC growth standards, there were 22 normal weight participants, 1 overweight participant, and 7 obese participants (Kuczynski et al., 2000).

Perceived stress was measured as a manipulation check of whether there was a need of the children for stress coping behaviors and whether perceived stress was lower after engaging in the coping behaviors. As shown in Fig. 1, perceived stress was greater \( (p < 0.05) \) during preparation of the speech and while giving speech and was not included in any of the final regression models.

Perceived stress then declined \( (p < 0.05) \) following the free choice period and did not differ \( (p > 0.05) \) from perceived stress during the baseline rest period in the stress condition. Systolic blood pressure was greater \( (p < 0.05) \) during speech preparation and during the speech than during baseline, and was reduced \( (p < 0.05) \) following the free choice period compared to the speech.

As shown in Table 2, there was significant main effect of activity type \( (p < 0.0001) \) for time spent engaged in the coping behaviors. Children spent more time watching TV than eating \( (p < 0.0001) \) or exercising \( (p < 0.085) \). There was no difference in time spent eating or exercising \( (p > 0.85) \).

Sequential regression models predicting change in eating behavior after stress are shown in Table 3. Changes in the amount of time spent eating \( (p < 0.04) \) and energy consumed \( (p < 0.03) \) were dependent on the interaction between dietary restraint and stress reactivity. As shown in the top of Fig. 2, children who were lower for restraint and stress reactivity were predicted to decrease their energy intake by 56 kcal. Children who were lower for restraint and higher for stress reactivity were predicted to increase their energy intake by 9 kcal. Children who were higher for restraint and lower for stress reactivity were predicted to increase their energy intake by 9 kcal. Children who were higher for restraint and higher for stress reactivity were predicted to increase their energy intake by 173 kcal. As shown in Fig. 2, children who were lower for restraint and stress reactivity were predicted to decrease their time spent eating by 88 s. Children lower for restraint and higher for stress reactivity were predicted to decrease their time spent eating by 14 s. Children higher for restraint and lower for stress reactivity were predicted to increase their time spent eating by 20 s. Children higher for restraint and higher for stress reactivity were predicted to increase their time spent eating by 207 s.

As shown in Table 4, changes in the time spent watching TV were dependent on the interaction \( (p < 0.04) \) between stress reactivity and usual TV time. As shown in Fig. 2, children who were lower in usual TV time and in stress reactivity were predicted to decrease their TV time by 66 s. Children who were lower in usual TV time and higher in stress reactivity were predicted to decrease their TV time by 187 s. Children who were higher in usual TV time

### Table 2

<table>
<thead>
<tr>
<th>Time (s) engaged in behaviors after the control reading and interpersonal stressor manipulations.</th>
<th>Control</th>
<th>Stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eating</td>
<td>TV</td>
<td>Exercise</td>
</tr>
<tr>
<td>Eating</td>
<td>TV</td>
<td>Exercise</td>
</tr>
<tr>
<td>209 ± 28</td>
<td>991 ± 67&lt;sup&gt;a&lt;/sup&gt;</td>
<td>239 ± 54</td>
</tr>
<tr>
<td>221 ± 31</td>
<td>966 ± 58&lt;sup&gt;a&lt;/sup&gt;</td>
<td>244 ± 37</td>
</tr>
</tbody>
</table>

Data are mean ± SE.

<sup>a</sup> Significantly different from time spent eating or exercising on both the control and stress days.

### Table 3

Sequential regression models predicting change in eating behaviors after psychological stress.

<table>
<thead>
<tr>
<th>B</th>
<th>( \beta )</th>
<th>( R^2 ) (unique)</th>
<th>95% CI ( R^2 )</th>
<th>Step p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in time eating</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>6.19</td>
<td>0.16</td>
<td>0.01–0.35</td>
<td>0.03</td>
</tr>
<tr>
<td>Step 1</td>
<td>Control day eating rate</td>
<td>–96.03</td>
<td>–0.50</td>
<td>0.08</td>
</tr>
<tr>
<td>Step 2</td>
<td>Dietary restraint</td>
<td>13.19</td>
<td>0.16</td>
<td>0.12</td>
</tr>
<tr>
<td>Stress reactivity</td>
<td>0.76</td>
<td>0.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 3</td>
<td>Restraint + reactivity</td>
<td>2.92</td>
<td>0.41</td>
<td></td>
</tr>
<tr>
<td>Change in kcal consumed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>–18.78</td>
<td>0.10</td>
<td>0.00–0.29</td>
<td>0.09</td>
</tr>
<tr>
<td>Step 1</td>
<td>Control day eating rate</td>
<td>–50.41</td>
<td>–0.40</td>
<td>0.16</td>
</tr>
<tr>
<td>Step 2</td>
<td>Dietary restraint</td>
<td>12.11</td>
<td>0.23</td>
<td>0.13</td>
</tr>
<tr>
<td>Stress reactivity</td>
<td>2.13</td>
<td>0.19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 3</td>
<td>Restraint + reactivity</td>
<td>1.93</td>
<td>0.42</td>
<td></td>
</tr>
</tbody>
</table>

B: Regression coefficient.

\( \beta \): Standardized regression coefficient.

\( R^2 \) (unique): Incremental increase in \( R^2 \) at each step of model.

95% CI \( R^2 \): 95% Confidence interval of the incremental increase in \( R^2 \) at each step of the model.
and lower in stress reactivity were predicted to decrease their TV time by 10 s. Only children who were higher in usual TV time and stress reactivity were predicted to increase their TV time by 93 s.

The interaction between stress reactivity and usual hard physical activity is shown in Table 5. The linear regression model with all children included is shown at the top of Table 5. The interaction between stress reactivity and usual hard physical activity was not significant \((p > 0.07)\). One child exercised on the control day for greater than 4 standard deviations above the mean time. This child was excluded from the analysis, and the linear regression model reflecting this exclusion is shown as the bottom model of Table 5. The change in time spent exercising \((p < 0.02)\) was dependent on the interaction between stress reactivity and usual hard physical activity. The changes in time spent exercising are shown in the bottom of Fig. 2. Once explored, the interaction did not provide the anticipated outcomes. Children who were lower in usual physical activity and in stress reactivity were predicted to increase their physical activity time by 50 s. Children who were lower in usual physical activity and higher in stress reactivity were predicted to decrease their physical activity time by 15 s. Children who were higher in usual physical activity and lower in stress reactivity were predicted to decrease their physical activity time by 26 s. Children who were higher in usual physical activity time and stress reactivity were predicted to increase their physical activity time by 50 s.

### Discussion

This study evaluated which behaviors children choose to cope with stress, and the individual difference factors that predict how much time children allocate to cope with stress by eating, watching television, and being physically active. A novel aspect of this study is that the children had a free choice of eating snack food, watching television, and being physically active; these behaviors were not studied in isolation as in previous studies. This is important because the results should more accurately mimic choices made in a real world environment where each of the behavioral alternatives could be available after stress. Understanding how children choose to behaviorally cope with stress is important because habits learned in childhood often track into adulthood and life stressors are present throughout life.

Overall, children spent more time watching television than eating or exercising in the free-access period following both the stressor and the control reading period. Television is one of the most commonly reported coping behaviors (Chen & Kennedy, 2005), and children also spend more time watching television than in activity other than sleeping on a daily basis (Rideout, Foehr, & Roberts, 2010), so it follows that they would spend most of their free-choice time watching television.

Indeed, changes in the amount of time children engaged in each coping behavior after stress were moderated by individual difference factors such as usual TV time, usual physical activity, and dietary restraint. Children who were greater in dietary restraint and stress reactivity were predicted to increase their energy intake much more than other children when stressed. This finding is similar to previous studies of children (Roemmich et al., 2002, 2011). To the best of our knowledge, this is the first demonstration that the individual difference model of stress-induced eating holds when other coping behaviors, including TV are equally accessible, as could occur in daily life. This suggests that some children do indeed increase their energy intake when stressed and do so for
reasons other than only having access to food and not to the other coping behaviors. In effect, it extends previous research by providing stronger evidence that stress reactive, dietary restrained children will choose to cope with their stress by eating even when other reinforcing behaviors such as TV are equally accessible.

While it is unclear when dietary restraint emerges in development, there is evidence of validity of the construct of dietary restraint in youth as young as 7 years of age (Shunk & Birch, 2004). Dietary restraint correlates with body dissatisfaction, dieting, and weight concerns in adolescents and adults (Heatherton, Nichols, Mahamed, & Keel, 1995; Cooley & Toray 2001; Neumark-Sztainer, Story, Hannan, Perry, & Irving, 2002). Since similar findings have been shown in children, adolescents, and adults, this suggests that the conceptualization of the construct is stable across age groups.

Dietary restrained children may be very susceptible to stress-induced eating for a number of reasons. One potential mechanism is a stress-induced reduction in self-control over food. Self-regulatory resources theory posits that self-regulatory resources are finite and depleted by self-initiated and situational demands such as stress (Vohs & Heatherton, 2000). Maintaining dietary restraint requires great amounts of self-regulation because large amounts of food are so readily available in our environment. The additional cognitive load of coping with a stressor overwhelms the self-regulatory resources, and the individual can no longer maintain their dietary restraint (Vohs & Heatherton, 2000). While eating is being conceptualized as a coping behavior, stress-induced eating could also be viewed as the result of a lack of coping. In effect, dietary restrained children are already constantly coping with the many environmental stressors, in the form of environmental food cues, to eat by maintaining their restraint. The additional situational demand of additional stressors results in a depletion of self-regulatory resources and the inability to cope by using dietary restraint when palatable food is a salient feature of the environment. Another potential mechanism for the loss of dietary restraint is the distractor hypothesis proposed by Herman and Polivy (1988). Individuals with higher dietary restraint may find food very salient and use eating as a distracting coping mechanism for stress (Herman & Polivy, 1988). Over time this may become a learned behavior. Other individuals may not find eating to be engaging enough to distract them from the stressor, and will cope with stress using other behaviors.

The effect of stress reactivity on the change in TV time after being stressed was moderated by usual TV time. Only children greater in usual TV time were predicted to cope with stress by increasing their TV time. All other children were predicted to decrease their TV time when stressed. While survey research has shown that some adults and children self-report an increase in TV time when stressed (Kurdek, 1987; Anderson, Collins, Schmitt, & Jacobowitz, 1996; Oplin 1997), only one study has shown this experimentally in children (Roemmich et al., 2003). However, these previous studies did not explore factors that may moderate television time with stress. There is a need for further research on the effects of psychological stress on children's sedentary behavior.

The level of usual hard physical activity moderated the change in time spent being physically active after stress. Children who had greater hard intensity physical activity were predicted to increase their time spent being active to cope with the interpersonal stress. Children who are willing to incur the discomfort of hard intensity exercise may be expected to like exercise or be motivated to engage in exercise (Roemmich et al., 2008). Moreover, because of the greater amount of time spent being physically active, these children may be more aware of the stress-reduction properties of physical activity and therefore may use physical activity to cope with stress (Dunn et al., 2001). However, a similar increase was also predicted in youth lower in usual physical activity and stress reactivity. This could be due to the physical activities available in the lab being novel to these children.

There were some limitations that necessitate caution when interpreting the results. Children were limited by how they could allocate their time. Children could engage in only one behavior at a time, so all of the activities substituted for one another. However, in a non-laboratory setting, some of these items may be complemen-
tary, such as eating while watching television (Roemmich et al., 2008). While the children who chose the activity they most wanted to do, the results may have been different if they were allowed to participate in more than one activity at a time. Parents were allowed to help their child during the dietary recall, and this could affect the accuracy of the usual energy intake in either a positive or negative fashion. However, since usual energy intake was not a significant predictor of either the change in energy intake or the change in time spent eating, and therefore was not included in any of the prediction models, this does not affect the interpretation of the results. Our measure of energy intake rate in this study is not eating rate as

### Table 5
Sequential regression models predicting change in physical activity time after psychological stress.

<table>
<thead>
<tr>
<th>Model</th>
<th>( \beta )</th>
<th>( R^2 ) (unique)</th>
<th>95% CI ( R^2 )</th>
<th>Step ( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in time exercising (all subjects)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>78.83</td>
<td>0.21</td>
<td>0.00–0.38</td>
<td>0.04</td>
</tr>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Usual hard activity</td>
<td>–228.63</td>
<td>–0.69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stress reactivity</td>
<td>–5.24</td>
<td>–0.31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Usual activity + reactivity</td>
<td>13.62</td>
<td>0.69</td>
<td>0.09–0.31</td>
<td>0.07</td>
</tr>
<tr>
<td>Change in time exercising (excluding outlier)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>49.77</td>
<td>0.04</td>
<td>0.00–0.18</td>
<td>0.95</td>
</tr>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Usual hard activity</td>
<td>–75.78</td>
<td>–0.24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stress reactivity</td>
<td>–6.43</td>
<td>–0.52</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Usual activity + reactivity</td>
<td>14.02</td>
<td>0.92</td>
<td>0.19–0.40</td>
<td>0.02</td>
</tr>
</tbody>
</table>

\( B \): Regression coefficient.
\( \beta \): Standardized regression coefficient.
\( R^2 \) (unique): Incremental increase in \( R^2 \) at each step of model.
95% CI \( R^2 \): 95% Confidence interval of the incremental increase in \( R^2 \) at each step of the model.
usually defined, but rather is energy intake rate. The foods differed in energy density (between 4.4 and 5.0 kcal/g), which may have affected eating rate. However, given that the study used a within-subjects design with all children completing both conditions and that the food provided to the children was the same in both conditions, any effects of differences in energy density of the foods should have been minimized. Another limitation of the study was the relatively small sample size. The current study is building on and confirms previous research that stress increases energy intake in dietarily-restrained individuals. It extends previous research by showing that this finding still remains in a new environment where other coping choices are available.

This study extends previous research by being the first to give children access to three common stress coping mechanisms rather than focusing solely on either food intake or changes in sedentary and physical activities. The data fit well with the individual difference model that there are certain physiological and psychological factors that interact to determine the outcome of stress reactivity on coping behaviors (Greeno & Wing, 1994). It is important to study how children cope with stress because the ability to successfully cope with stress as a child can affect how resilient they are in dealing with difficult situations as an adult (Garmezy 1987).

References