A Longitudinal Examination of the Association Between Parenting Behavior, Social-Emotional Coping, and Adolescent Disordered Eating

A Dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at George Mason University

by

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ABSTRACT

A LONGITUDINAL EXAMINATION OF THE ASSOCIATION BETWEEN PARENTING BEHAVIOR, SOCIAL-EMOTIONAL COPING, AND ADOLESCENT DISORDERED EATING

Laura Elspeth Martinson, Ph.D.
George Mason University, 2015
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The purpose of this dissertation was to explore the role that parent-related environmental risk factors (poor parental monitoring and mental health) and adolescent social-emotional coping skills play in the development of disordered eating behaviors and attitudes (DEBA) in a clinical sample of adolescents. These questions were explored using an existing dataset collected to examine the efficacy of an adjunctive adolescent suicide, substance abuse, and HIV prevention program. The first study examined whether parental monitoring predicts more or less favorable trajectories of DEBA, particularly among females. It was hypothesized that lower parental monitoring would predict increases in DEBA over time. Participants included 87 adolescents (61% female, 46.5% Caucasian, 34.9% African-American, and 18.6% Other, mean age = 15.5, SD = 1.4) in mental health treatment and their parents. Data were collected at baseline as well as 6-month and 12-month follow-ups. Individual growth curve (IGC) analyses were used to examine growth
or change in DEBA over the course of one year. Parental monitoring predicted between-
person change in DEBA. Adolescents who reported lower parental monitoring showed
trajectories characterized by increases in DEBA. The same pattern emerged when using
parent report of monitoring, though only a trend was evident. When analyses were
restricted to females, the main effect of parental and adolescent report of monitoring on
DEBA were equally strong. Results may suggest that parents who are less knowledgeable
about their adolescents’ daily lives, may be less aware of DEBA, and thus less likely to
intervene.

The second study examined whether adolescent social-emotional coping skills moderate
the association between parental mental health and adolescent DEBA. It was
hypothesized that the association between parental mental health (depression and anxiety)
and adolescent DEBA would be stronger among youth with relatively poorer social-
emotional coping skills (emotional awareness/expression, emotion regulation,
adaptability). Data were collected from the same 87 parent-adolescent dyads described
above. A series of linear regression analyses were used to examine study hypotheses.
Higher parental depression and anxiety were only found to be associated with greater
DEBA among adolescents who reported poorer (versus stronger) emotional
awareness/expression skills and less (versus greater) ability to regulate emotions. Results
may suggest that adolescents who lack the ability to effectively recognize, express, and
manage negative emotions that arise in the context of a more challenging home
environment, may be more likely to engage in maladaptive coping behaviors, such as
disordered eating, relative to those who possess stronger social-emotional coping skills.
A different pattern of results emerged when adaptability was examined as a moderator. Lower parental anxiety was found to predict lower DEBA among youth with stronger (but not weaker) adaptability skills. No association was found with parental depression. Hence, adaptability, or perceived problem solving skills, protect against DEBA, but only when parental anxiety is minimal. Overall, results suggest that parent monitoring and mental health play a significant role in adolescent DEBA and should be addressed in eating disorder prevention efforts with youth and families. Bolstering adolescent social-emotional coping skills may also help protect against adolescent DEBA.
THE EFFECT OF PARENTAL MONITORING ON TRAJECTORIES OF DISORDERED EATING ATTITUDES AND BEHAVIORS AMONG ADOLESCENTS: AN INDIVIDUAL GROWTH CURVE ANALYSIS

Introduction

Disordered eating attitudes and behaviors, including frequent dieting, extreme weight control behaviors (e.g., fasting, skipping meals, self-induced vomiting, diet pills), binge eating, and body dissatisfaction are prevalent among adolescents (Croll, Neumark-Sztainer, Story, & Ireland, 2002; Eaton, Kann, Kinchen, Shanklin, Ross, Hawkins, et al., 2010; Ricciardelli & McCabe, 2001; Stice and Whitenton, 2002). In fact, in a sample of over 80,000 ninth and twelfth graders, 56% of females and 29% of males reported disordered eating behaviors (Croll et al., 2002). These maladaptive behaviors and attitudes are associated with substantial psychological, social, and physiological disturbances (Moor, Vartanian, Touyz, & Beaumont, 2004; Schmidt, Lee, Perkins, Eisler, Treasure, Beechum, et al., 2008) and are common precursors to a full diagnosable eating disorder (Patton, Coffey, & Sawyer, 2003; Santonastaso, Friederici, & Favaro, 1999). Research that examines factors that may influence adolescent disordered eating attitudes and behaviors are of critical importance in addressing this significant public health problem.

The primary purpose of the present study is to examine the potential role that parenting behavior plays in the development of maladaptive eating patterns and attitudes
over time in a clinical adolescent sample, particularly among females. As summarized in a recent review, a fair amount of research suggests that dysfunctional family environments and unhealthy parenting may not play a primary causal role in eating pathology, but can affect the genesis and maintenance of disordered eating (Le Grange, Lock, Loeb, & Nicholls, 2010). For example, low affection, low communication, parental separation, high parental expectations, low parental contact, parental criticism about shape and weight, and over- or under-involvement (Botta & Dumlao, 2002; Graber, Brooks-Gunn, Paifoff, & Warren, 1994; Johnson, Cohen, Kasen, & Brook, 2002; Neumark-Sztainer, Story, Hannan, Beuhring, & Resnick, 2000; Shoebridge & Gowers, 2000; Vidović, Jureša, Begovac, Mahnik, & Tocilj, 2005; Welch, Doll, & Fairburn, 1997) have been associated with disordered eating in adolescents. Less well studied, though potentially important, is the effect of parental monitoring on adolescent disordered eating behaviors and attitudes.

Parental monitoring refers to parental knowledge of their children’s whereabouts and daily activities. Parents who fail to adequately monitor their children tend to be less involved in their adolescents’ lives and thus less likely to be knowledgeable about difficulties (i.e., peer problems, mental health problems, academic difficulties, substance use, etc.). An extensive amount of research suggests that poor parental monitoring is associated with a range of negative adolescent outcomes, including externalizing behavior problems (Bowman, Prelow, & Weaver, 2007; Buehler, Benson, & Gerard, 2006; Donenberg, Wilson, Emerson, & Bryant, 2002; Elgar, Mills, McGrath, Easchbusch, & Brownridge, 2007; Formoso, Gonzales, & Aiken, 2000; Fosco,
Stormshak, Dishion, & Winter, 2012; Fulkerson, Pasch, Perry, & Komro, 2008; Kim, Hetherington, & Reiss, 1999; Laird, Criss, Pettit, Dodge, & Bates, 2003; 2008; Stattin & Kerr, 2000; Van Loon, Van de Ven., Van Doesum, Witteman, & Hosman, 2013; Vieno, Nation, Pastore, & Santinello, 2009; Walton & Fouri, 2010; Wang, Li, Cottrell, Deveaux, & Kaljee; 2013; Wiesner & Silbereisen, 2003) as well as internalizing symptoms and behaviors, such as depression, anxiety, and suicidal ideation (Blodgett, Gondoli, Corning, McEnery, & Grundy, 2007; Buehler et al., 2006; Gil-Rivas, Greenberger, Chuansheng, & Lopez-Lena, 2003; Jacobson & Crockett, 2000; King, Schwab-Stone, Flisher, Greenwald, Kramer, Goodman, & Gould et al., 2001). Less research has been conducted to examine the association between parental monitoring and disordered eating. However, it stands to reason that parents who do not adequately monitor their adolescents may be less aware of the presence of disordered eating patterns. Thus, they may be less likely to intervene and seek needed help for their adolescent.

Only a handful of studies have examined the association between parental monitoring and disordered eating. In a cross-sectional study conducted with 2793 racially/ethnically and socio-economically diverse adolescents from the community, Berge, Wall, Larson, Eisenberg, Loth, and Neumark-Sztainer (2012) found that greater adolescent report of maternal monitoring was associated with lower odds of engaging in extreme dieting and disordered eating behaviors for both males and females. Greater adolescent report of paternal monitoring was also associated with lower odds of disordered eating, but only among females. In a sample of 363 middle-school females, McVey, Pepler, Davis, Flett, and Abdolell (2002) found that lower adolescent report of
paternal (but not maternal) involvement (e.g., the degree to which parents are interested in, knowledgeable about, and spend time relating to their children concerning activities and experiences) was associated with greater levels of disordered eating using a cross-sectional design. In a longitudinal study that included 191 community adolescents and their parents, May, Kim, McHale, and Crouter (2006) found that increases in females’ weight concerns were associated with decreases in maternal monitoring, but not paternal monitoring, over the course of three years. For males, no significant relationship was found between maternal or paternal knowledge and eating behaviors. In this study, a combined parent-adolescent rating of monitoring was used.

As evidenced in the studies described above, research suggests that higher levels of parental monitoring may serve as a protective factor, while lower levels may serve as a risk factor, for adolescent eating disordered behavior. Furthermore, this relationship between monitoring and disordered eating may vary by adolescent gender, with the relationship stronger for females than males. This is not surprising given that gender differences exist in both the prevalence rates of clinical and subclinical eating disorders with rates higher among females; Croll et al., 2002; Patton et al., 1997; Stice, Shaw, & Oehner, 2011) as well as some correlates of disordered eating. For example, in a community based study with over 80,000 adolescents, Croll et al. (2002) found that females relative to males with disordered eating were more likely to report strong appearance concerns (73% vs. 41%). Another study found that males desired to be bigger and more muscular, rather than thinner, which is a primary concern for females (Furnham & Calnan, 1998). In a recent review article, it was concluded that obesity and
involvement in sports may present a greater risk for eating disorders in adolescent males than in females (Muise, Stein, & Arbess, 2003). Moreover, prior research also suggests that females may respond more positively to parental monitoring in general. Several studies have shown that parental monitoring is more protective against delinquent behaviors for adolescent females than males (Bowman et al., 2007; Buehler et al., 2006; Formoso et al., 2000; Jacobson & Crockett, 2000; Steinberg, 1986; Weintraub & Gold, 1991).

In sum, research supports the association between poor parental monitoring and greater levels of adolescent disordered eating, and some research suggests this relationship differs by gender. Yet, with the exception of research conducted by May et al. (2006), studies to date have only examined this relationship using cross-sectional designs and only included adolescent report of parental monitoring. Further, to our knowledge, no research has been conducted to explore this relationship in a general clinical sample of adolescents. The present study has two aims. The first aim was to examine whether parental monitoring, as reported by adolescents and their parents, predicts more or less favorable trajectories of maladaptive eating behavior and attitudes over the course of one year in a clinical sample of adolescents. Second, we explored whether these trajectories vary when study analyses are limited to females. We used individual growth curve (IGC) analyses to examine growth or change in eating attitudes and behaviors for both aims. We hypothesized that adolescents with parents who provided low levels of parental monitoring would be more likely to develop maladaptive eating attitudes and behaviors than those who received greater parental monitoring.
hypothesized that this association would be present in the sample as a whole, and particularly strong among females.

**Methods**

**Participants**
Participants included 87 adolescents, ages 13 through 18, and their parents (174 total individuals). These families participated in a pilot trial (6 dyads) or randomized clinical trial (81 dyads) that examined the efficacy of a suicide, substance abuse, and HIV prevention program for adolescents in mental health treatment (Project SHAPE).

Families were randomized to a 12 hour prevention workshop plus a 2 hour individualized booster session or an assessment-only control condition. Adolescents across both arms were receiving community based mental health treatment at the time of recruitment. Inclusion criteria for the study were as follows: adolescent enrollment in mental health treatment, parent and adolescent proficiency in English, and parent and adolescent residing in the same home. Exclusion criteria included a diagnosis of drug or alcohol dependence, current enrollment in a drug or alcohol treatment program, HIV infection, pregnancy, or adolescent cognitive level that would prohibit understanding of study material. The adolescent sample was primarily female (n = 53 females and 34 males) with a mean age of 15.5 (SD = 1.4). The sample was racially (46.5% Caucasian, 34.9% African-American, and 18.6% “Mixed race/Other”) and ethnically (82.8% non-Hispanic, 17.2% Hispanic) diverse.

**Procedure**
Participants were recruited via clinical referral from counselor or administrative staff at community mental health centers (27%), a youth shelter (43%), private mental
health practices (10%), high school counselors (2%), or juvenile court staff (10%), as well as advertisements posted in local newspapers, on Craigslist, and university listserves (10%) (3% did not specify source of recruitment or referral). Parents and teens interested in participating in Project SHAPE provided their contact information to a counselor or administrative personnel at one of the recruitment facilities or contacted the research team directly based on information provided in study advertisements. The doctoral level project director or a graduate-level research assistant, screened parent and teen separately for eligibility via phone or in person and further explained the study. They were informed that the study would consist of four assessment time points, including a baseline and three follow-up assessments (one, six, and twelve months post-baseline). Those randomized to the intervention condition received a one and a half day group workshop (12 hours total) plus one booster session one month later (2 hours total) and those randomized to the assessment only control were provided with reading materials on substance use, HIV/STDs, and suicide. Parent and adolescent were also informed that they would each receive between $25 and $75 at each of the four assessments. If eligibility criteria were met, an appointment was made for the baseline assessment, at which time, consent and adolescent assent was obtained. A total of 293 families were screened for eligibility and 87 were retained in the study. The other 206 families were either deemed ineligible (primarily because adolescents were not in mental health treatment or were substance dependent at the time of screening) or declined participation. Though most families did not specify a reason for declining, the most common reasons reported were: time commitment too great, wanted guaranteed placement in the workshop
intervention condition, wanted long term mental treatment, and scheduling conflicts. All measures used for the present study were completed via a computer questionnaire. This study used data obtained at baseline for the predictor variable (parental monitoring). Baseline, six month follow-up, and twelve month follow-up data were used for the outcome variable (disordered eating attitudes and behaviors). Of the 87 participants, 62 provided data at six month follow-up and 61 provided data at twelve month follow-up. All study procedures were approved by the university affiliated institutional review board.

**Measures**

**Demographic Variables.** Demographics were assessed by participants’ self-reported gender, age, ethnicity, and race as part of the baseline assessment.

**Parental Monitoring:** The 6-item Parental Monitoring subscale of the Parental Monitoring Questionnaire (PMQ; Stattin & Kerr, 2000) was used to assess degree of parental monitoring (i.e., parental knowledge of adolescent whereabouts and daily activities). Each item is rated on a 5-point Likert scale (‘no, never’ to ‘yes, always’). Both the adolescent-report and parent-report versions were used. This subscale had high internal consistency (chronbach’s alpha =.87 for adolescents and .85 for parents) in the present study.

**Eating Disorder Attitudes and Behaviors.** The 13-item Dieting subscale of the Eating Attitudes Test (EAT-26; Garner et al., 1982) was used to assess extreme dieting attitudes and behaviors and body shape preoccupation associated with eating disorders at baseline and 12-month follow-up. Each item is rated on a 6-point Likert scale (‘never’ to
‘always’). It had high internal consistency (chronbach’s alpha = .80 to .84) across the three time points in this study. According to Garner et al (1982), the dieting subscale has a high correlation with the EAT-26 total score, and thus may be used as an “economical substitute for the total scale”.

**Data Analysis Plan**

In preliminary analyses, bivariate relationships between disordered eating attitudes and behaviors (measured at baseline, 6-month follow up, and 12-month follow up), adolescent and parent report of parental monitoring (at baseline), and potential covariates (demographic variables, intervention condition, hours seen in mental health treatment over the 12 month study period) were examined via correlations and t-tests.

Individual Growth Curve (IGC) analyses were used to investigate within-person systematic change and between-person differences in the development of disordered eating attitudes and behaviors over time. IGC analyses allowed us to examine variation in the growth parameters (i.e., intercept and slope) for each participant’s EAT-Dieting trajectory. Our IGC analyses were conducted using linear mixed models in SPSS Statistics 22. This method of analysis represents a powerful way to assess change in a continuous dimension overtime within individuals (Rogosa, Brandt, & Zimowski, 1982; Rogosa & Willett, 1985) and has several advantages over more conventional statistical techniques that examine change over time (e.g., generalized linear models, analysis of variance, and analysis of covariance) (Shek & Ma, 2011). IGC analyses do not require balanced data across different waves of data, resulting in a more flexible approach when handling unequal sample size, inconsistent time interval, and/or missing data (Shek &
Ma, 2011). Additionally, they are more powerful, as they model the true covariance structure as opposed to imposing a different structure on the data (Shek & Ma, 2011).

The process of using IGC analyses entails specifying different sets of models in order to examine change in the predictive effect when additional variables are added. First, we examined the unconditional means model in which no predictors were included in order to partition the variance within-person and the variance between-person in EAT-Dieting scores separately. Second, we examined the unconditional linear growth model by adding time-point as the only predictor in order to examine individuals’ EAT-Dieting trajectories over time. Such unconditional analyses are useful for describing the net variation in slope and intercept across individuals. Before adding the predictor of interest (parental monitoring) to the linear growth model, a series of three conditional linear growth models were created to examine the influence of three potential covariates on EAT-Dieting trajectories, including gender, intervention condition, and hours spent in community based mental health treatment. These variables were selected as covariates given that gender differences in eating behavior have been found in prior research and material presented in the context of the study intervention and outpatient mental health treatment could influence parental monitoring behavior. Then, we conducted two conditional linear growth models in which we examined systematic between-person differences in growth parameters of EAT-Dieting trajectories as a function of adolescent’s report of parental monitoring and parent’s report of parental monitoring. Significant parental monitoring-by-time interactions were probed for simple slopes (Preacher, Curran, & Bauer, 2006) by running the unconditional linear growth model
among participants low in parental monitoring (-1 SD) and high in parental monitoring (+1 SD) to further understand the direction of the relationship between parental monitoring and disordered eating trajectory.

Lastly, each of the two parental monitoring (adolescent and parent report) conditional linear growth models was examined among females only. Given that the sample only included a small number of males (n=34), and the males had a very restricted range on the EAT-Dieting scale (0-15) compared to the females (0-33), the growth models were not examined among males alone.

Results

Descriptive Statistics

Descriptive statistics for measures of parental monitoring (adolescent and parent report) and disordered eating attitudes and behaviors are presented in Table 1.

Table 1: Descriptive Statistics and Bivariate Correlations of Study Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>Range</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. PMQ – Adolescent Report</td>
<td>30.43</td>
<td>8.46</td>
<td>13-45</td>
<td>-</td>
<td>.25*</td>
<td>.09</td>
<td>.07</td>
<td>.23*</td>
</tr>
<tr>
<td>2. PMQ – Parent Report</td>
<td>35.25</td>
<td>6.76</td>
<td>20-45</td>
<td>-</td>
<td>.14</td>
<td>.08</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td>3. Baseline EAT-26 – Dieting</td>
<td>4.05</td>
<td>4.98</td>
<td>0-28</td>
<td>-</td>
<td>.55**</td>
<td>.47**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.6 mo EAT-26 – Dieting</td>
<td>4.15</td>
<td>5.51</td>
<td>0-30</td>
<td>-</td>
<td>.65**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.12 mo EAT-26 – Dieting</td>
<td>4.30</td>
<td>5.85</td>
<td>0-33</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: PMQ = Parental Monitoring Questionnaire; EAT-26 = Eating Attitudes and Behaviors Test – 26
*Correlations for the EAT-26 – Dieting computed using the log transformation
*p < .10, **p < .05, ***p < .01
Preliminary Bivariate Analyses

As scores on the EAT-Dieting subscale were positively skewed (>2), a log transformation was conducted to decrease the skew to <1. All analyses were conducted with the transformed version of this variable. All other variables were normally distributed.

Correlation coefficients were computed to examine the bivariate relationships between parental monitoring (adolescent and parent report) and disordered eating attitudes and behaviors (measured at baseline, 6-month follow up, and 12-month follow up) (Table 1). There was a trend toward a negative correlation between adolescent report of parental monitoring and eating disorder attitudes and behaviors at 12-month follow up. Bivariate relationships were also examined between demographic variables, hours seen in mental health treatment over the study period, study intervention condition (prevention workshop or assessment only), and predictor and outcome variables. Female gender was significantly correlated with eating disorder attitudes and behaviors at 6-month follow up, such that females reported higher levels of eating disorder symptoms than males. No other significant associations were found.

Individual Growth Curve Analyses

In the first model, the unconditional means model, no predictors were included in order to partition the variance within-person and the variance between-person separately (see Table 2). The Intraclass Correlation (ICC) was approximately .525, which indicates that 52.5% of the variance in EAT-Dieting scores was due to between-person differences and 47.5% was due to within-person differences. This means that slightly over half of the variation in the entire sample’s eating scores was due to differences between participants.
In the second model, the unconditional linear growth model, time was added as a predictor to examine individuals’ EAT-Dieting trajectories over time (see Table 2). Time was not a significant predictor, indicating that there was not a significant change in the mean EAT-Dieting score over the course of one year. However, time did account for 10.9% of within-person variance in EAT-Dieting scores. See Figure 1 for a plot of all participants’ individual growth curves.

Table 2: EAT-Dieting Individual Growth Curve Analyses

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unconditional Means Model</th>
<th>Unconditional Linear Growth Model</th>
<th>Linear Growth Model with Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Estimate</td>
<td>SE</td>
<td>p-value</td>
</tr>
<tr>
<td>Intercept</td>
<td>-0.02</td>
<td>0.04</td>
<td>0.66</td>
</tr>
<tr>
<td>Time</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condition x Time</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model Fit Criterion</td>
<td>-2LL</td>
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</table>

* p < .10,  * p < .05, **p < .01

Figure 1: Plot of all EAT-Dieting Individual Growth Curves
Next, three conditional linear growth models examined the influence of potential covariates (gender, intervention condition, and hours spent in community based mental health treatment) on EAT-Dieting trajectories. Gender was marginally significant in predicting between-person intercept variance, but not slope variance, in EAT-Dieting trajectories, meaning that gender predicted baseline EAT-Dieting scores but did not predict the rate of change in EAT-Dieting over the year. Specifically, females reported greater disordered eating attitudes and behaviors at baseline ($\beta = .15, p = .05$). Intervention condition trended towards significantly predicting slope variance, but not intercept variance, such that individuals in the prevention workshop group showed a faster rate of change in EAT-Dieting score over the course of one year than the assessment only group ($\beta = .04, p = .08$), but there was no significant difference in baseline EAT-Dieting score between the two groups. Hours spent in community based mental health treatment did not significantly predict variance in intercept or slope of EAT-Dieting trajectories. To control for gender and intervention condition in all IGC analyses, the base linear growth model to which predictors of interest (adolescent and parent report of parental monitoring) were added included gender and intervention condition (Table 2).

**Parental Monitoring (Adolescent Report)**

According to results of the linear growth model including parental monitoring (adolescent report) as a predictor of EAT-Dieting trajectories, parental monitoring by adolescent report significantly predicted between-person variance in slope ($\beta = -.01, p < .05$) (see Table 3). Specifically, results suggest that there was a significant change in
disordered eating attitudes and behaviors in a maladaptive direction (i.e., less decrease or greater increase in disordered eating) among adolescents who reported lower levels of parental monitoring than those who report greater parental monitoring. Parental monitoring (adolescent report) explained 70.3% of the variance in the slopes of the EAT-Dieting trajectories. Additionally, by adding parental monitoring (adolescent report) as a predictor to the linear growth model, the -2 Log Likelihood (an assessment of model fit) decreased from 135.85 to 130.18, indicating that this model is a better fit to the data. These results provide support for the hypothesis that parental monitoring affects the developmental trajectory of disordered eating.

Table 3: Parental Monitoring as a Predictor of EAT-Dieting Individual Growth Curves

<table>
<thead>
<tr>
<th>Variable</th>
<th>Linear Growth Model with Controls</th>
<th>Model Parental Monitoring (Adolescent)</th>
<th>Model Parental Monitoring (Parent Report)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Estimate</td>
<td>SE</td>
<td>p-value</td>
</tr>
<tr>
<td>Intercept</td>
<td>-.02</td>
<td>.04</td>
<td>.05</td>
</tr>
<tr>
<td>Time</td>
<td>-.01</td>
<td>.02</td>
<td>.70</td>
</tr>
<tr>
<td>Gender</td>
<td>.13</td>
<td>.07</td>
<td>.10*</td>
</tr>
<tr>
<td>Condition x Time</td>
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<td>.02</td>
<td>.07*</td>
</tr>
<tr>
<td>Parent Monitoring</td>
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<td>.00</td>
<td>.56</td>
</tr>
<tr>
<td>Parent Monitoring x Time</td>
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<td>.00</td>
<td>.02*</td>
</tr>
</tbody>
</table>

Model Fit Criterion

<table>
<thead>
<tr>
<th>-2LL</th>
<th>135.85</th>
<th>130.18</th>
<th>132.65</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of variance in EAT-Dieting trajectory explained by predictor</td>
<td>70.3</td>
<td>50.3</td>
<td></td>
</tr>
</tbody>
</table>

*p < .10,  *p < .05, **p < .01

Probing results indicated that adolescents who reported low levels of parental monitoring had increasing EAT-Dieting trajectories (β = .11, p < .05). Probing results did not find a significant change in the slope of the EAT-Dieting trajectory for adolescents who reported high levels of parental monitoring. In sum, adolescents
reporting lower levels of parental monitoring tended to show an increasing trajectory of disordered eating attitudes and behaviors over the year, while those reporting higher levels of parental monitoring tended not to show a significant change in disordered eating attitudes and behaviors.

**Parental Monitoring (Parent Report)**

According to results of the linear growth model including parental monitoring (parent report) as a predictor of adolescent EAT-Dieting trajectories, parental monitoring by parent report trended towards significantly predicting between-person variance in slope \(\beta = -.01, p = .07\) (see Table 3). Specifically, results suggest that there was a trend toward a significant change in disordered eating attitudes and behaviors in a maladaptive direction (i.e., less decrease or greater increase in disordered eating) among adolescents whose parents reported lower levels of parental monitoring than those whose parents reported greater parental monitoring. Parental monitoring (parent report) explained 50.4% of the variance in the slopes of the EAT-Dieting trajectories. Additionally, by adding parental monitoring (parent report) as a predictor to the linear growth model the -2 Log Likelihood (an assessment of model fit) decreased from 135.85 to 132.65, indicating that this model is a better fit to the data. These results provide preliminary support for the hypothesis that parental monitoring affects the developmental trajectory of disordered eating, though only at a trend level.

**Parental Monitoring in Female Adolescents**

The adolescent- and parent-report of parental monitoring linear growth models were each examined among only female adolescents. Similar to results from analyses
examining the influence of adolescent report of parental monitoring on EAT-Dieting trajectory in the full sample, results suggest that there was a significant change in disordered eating attitudes and behaviors in a maladaptive direction (i.e., less decrease or greater increase in disordered eating) among females who reported lower levels of parental monitoring than those who report greater parental monitoring ($\beta = -.01, p < .05$) (see Table 4). Probing results indicated that females who reported lower levels of parental monitoring trended towards increasing EAT-Dieting trajectories ($\beta = .17, p = .09$).

Results were similar in the full sample, but reached full significance. Similar to the full sample, probing results did not yield a significant change in the slope of the EAT-Dieting trajectory for adolescents who reported high levels of parental monitoring. In sum, female adolescents reporting lower levels of parental monitoring trended toward an increase in disordered eating attitudes and behaviors over the year, while those reporting higher levels of parental monitoring tended not to show a significant change in disordered eating attitudes and behaviors.

### Table 4: Parental Monitoring as a Predictor of EAT-Dieting Individual Growth Curves in Females

<table>
<thead>
<tr>
<th>Variable</th>
<th>Linear Growth Model with Controls</th>
<th>Model Parental Monitoring (Adolescent)</th>
<th>Model Parental Monitoring (Parent Report)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Estimate</td>
<td>SE</td>
<td>p-value</td>
</tr>
<tr>
<td>Intercept</td>
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<td>.05</td>
<td>.32</td>
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<tr>
<td>Time</td>
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<td>.04</td>
<td>.49</td>
</tr>
<tr>
<td>Condition x Time</td>
<td>.07</td>
<td>.04</td>
<td>.05*</td>
</tr>
<tr>
<td>Parent Monitoring</td>
<td>.00</td>
<td>.01</td>
<td>.56</td>
</tr>
<tr>
<td>Parent Monitoring x Time</td>
<td>-0.01</td>
<td>.00</td>
<td>.03*</td>
</tr>
</tbody>
</table>

-2LL Criterion: 99.00, 93.86, 94.63

*% of variance in EAT-Dieting trajectory explained by predictor: 84.4, 83.6

*p < .10,  *p < .05, **p < .01
Results from analyses examining the influence of parent report of parental monitoring on EAT-Dieting trajectories suggest that there was a significant change in disordered eating attitudes and behaviors in a maladaptive direction (i.e., less decrease or greater increase in disordered eating) among females whose parents reported lower levels of parental monitoring compared to those whose parents reported greater parental monitoring ($\beta = -.01, p < .05$) (see Table 4). Similar results were found in the full sample, but only at the trend level. Probing results were not significant, thus, we are not able to draw conclusions about the direction of EAT-Dieting trajectories of adolescents whose parents reported low versus high levels of parental monitoring.

**Discussion**

This study explored change in eating attitudes and behaviors over the course of one year in a clinical sample of adolescents. It also explored the degree to which parental monitoring plays a role this change. Specifically, individual growth curve analysis was used to examine whether parental monitoring predicts more or less favorable trajectories of maladaptive eating behavior and attitudes in the sample as a whole and among females alone. Notably, this is the first study, to our knowledge, to use a longitudinal design to examine the relationship between parental monitoring and disordered eating using adolescent and parent report of monitoring. Furthermore, this study is also unique because it employs a racially and economically diverse sample with a relatively high percentage of males, whereas the majority of eating disorder studies consist of predominantly female, Caucasian samples. While a significant change in mean level of eating attitudes and behavior was not found in the sample as a whole, which likely stems
from the fact that a heterogeneous versus eating specific clinical sample was employed, between person change was predicted by degree of parental monitoring.

Consistent with study hypotheses, adolescents who reported lower levels of parental monitoring tended to show an increasing trajectory of disordered eating attitudes and behaviors. These results are consistent with previous cross-sectional research that has found a negative association between adolescent report of parental monitoring and disordered eating (Berge et al., 2012; McVey et al., 2002). The same pattern of results was found using parent report of parental monitoring, though results only trended toward significance. Generally, these results support the importance of parental monitoring on adolescent mental health in general and eating disordered behavior specifically (Graber et al., 1994; Jacobson & Crockett, 2000; Johnson et al., 2002; Shoebridge & Gowers, 2000).

Adequate parental monitoring may be a marker of healthy involvement. If a parent is less involved and less knowledgeable about their adolescent’s daily life, the parent might be less aware if his or her child begins to demonstrate disordered eating attitudes and behaviors or to experience certain risk factors for disordered eating (e.g., teasing, low self-esteem, anxiety, depression). Hence, the parent may be less likely to intervene to address his or her adolescent’s struggles. In contrast, a parent who is actively monitoring may be more attuned to concerning changes in his or her child and quicker to provide needed support.

Interestingly, while the direction of effect was consistent across adolescent and parent report, lending credence to study findings, adolescent perception of parental monitoring had a stronger effect on eating disordered attitudes and behavior relative to
parental perception (only a trend) in the sample as a whole. This suggests that adolescents’ perception of their parents’ knowledge about their daily activities may be more important than parent’s perception with regard to the development of disordered eating. Adolescents who perceive higher levels of monitoring may feel that their parents are more attentive to and interested in them. However, when analyses were restricted to females alone, the main effect of parental and adolescent report of parental monitoring on eating attitudes and behavior were equally strong. Consistent with prior research, this may suggest that parental monitoring may play a greater protective role for females relative to males (Bowman et al., 2007; Bueler et al., 2006; Formoso et al., 2000; Jacobson & Crockett, 2000; Steinberg, 1986; Weintraub & Gold, 1991). It may also reflect that the nature of monitoring may differ between males and females. Indeed, there exists research to suggest that parents may monitor adolescent females more closely relative to males (Kerr & Stattin, 2000; Jacobson & Crockett, 2000). Thus, parents may be more attuned to their monitoring behavior for their female offspring. Alternatively, it is also possible that the inclusion of males attenuated the significance of study results given the relatively more restricted range among males in eating disordered attitudes and behaviors in the present sample.

**Clinical Implications**

Results of this study hold several important clinical implications. Adolescents who present for mental health treatment may be at risk for disordered eating if their parents do not provide adequate monitoring, particularly if they are female. Thus, it will be important for clinicians to assess parental monitoring behavior as perceived by both
parents and adolescents and teach parents monitoring skills as needed. This may help to prevent the escalation of disordered eating attitudes and behavior among at risk youth. More generally, these results highlight the importance of involving parents in their adolescent’s mental health treatment. Indeed, one of the most promising evidence-based treatment approaches for adolescents with eating disorders is Family Based Therapy (also referred to at the Maudsley Approach) (Lock, Le Grange, Agras, Moye, Bryson, & Jo, 2010).

Limitations
While the current results offer new and important data for understanding how parental monitoring relates to eating disorder attitudes and behaviors, several limitations deserve mention. While there was adequate power to detect significant main effects, our sample size was relatively small, which may have affected our ability to detect significance when probing with simple slopes analyses. Additionally, our relatively small sample size and restricted range of EAT-Dieting scores for male participants, precluded our ability to directly compare males and females in the models under investigation. Moreover, because the study sample only included adolescents in mental health outpatient treatment, results may not readily apply to other populations. Relatedly, generalizability is also limited by study recruitment and retention rates for the parent prevention study, which are notably low for family-focused prevention research in general (see Heinrichs, Bertram, Kuschel, & Hahlweg, 2005; Spoth & Redmond, 2000). However, rates in the present study are better than or consistent with those of other community based prevention studies for at-risk youth that include parents (e.g., Wu et al.,
Lastly, the rate of eating disorder attitudes and behavior present in the sample was somewhat lower in the present study relative to previously reported adolescent norms. The mean score of the EAT-Dieting scale for females in our sample was 4.8 (SD=5.7), 5.4 (SD=6.4), and 5.4 (SD=7.1) at baseline, 6 months, and 12 month (range 0 to 33) and for males was 3.0 (SD=3.5), 2.1 (SD=2.7), and 2.6 (SD=2.6) (range 0 to 15) at each of the respective time points. A study of over 1,300 high school students found a mean of 7.9 (SD=8.0) for females and 2.8 (SD=2.6) for males on the EAT-Dieting scale (Rosen, Silberg, & Gross, 1988). While the males in our study scored in a comparable range, the mean score for females was notably lower than reported norms. Therefore, results may not apply to samples with greater eating pathology.

**Future Directions**
Findings from this study suggest several directions for future research. It would be valuable to replicate this study in a larger, more diverse sample. To further study gender differences in the relationship between parental monitoring and disordered eating attitudes and behaviors, it would be particularly important to include more males in the study. It would also be interesting to include both maternal and paternal caregivers in order to examine parental gender as a potential moderator. It would be interesting to test our hypotheses in a clinical population of individuals with eating disorders to determine whether the models examined in the present study receive support among those with more severe eating pathology. It would be equally valuable to test our hypotheses in a non-clinical sample, given that over 50% of teenage girls and 33% of teenage boys are
using restrictive measures to lose weight at any given time (Neumark Sztainer, 2005). Such studies could yield data to inform universal prevention programs. Lastly, these data were gathered in the context of a clinical intervention study. While the intervention was not designed to address eating pathology and intervention condition was controlled in analyses, it would be beneficial to conduct a similar study using a naturalistic longitudinal assessment design.
Introduction

Eating disorders are often first diagnosed during adolescence and comprise the third most common chronic illness among adolescents, after obesity and asthma (Fisher, Golden, & Katzman, 1995). Just as concerning is the prevalence of sub-clinical eating pathology (e.g., desire to lose weight, fear of being overweight, guilt over eating, preoccupation with food and weight, undue influence of body shape and weight on self-evaluation). In a sample of over 80,000 ninth and twelfth graders, 56% of 9th-grade females and 28% of 9th-grade males reported disordered eating behaviors (e.g., fasting or skipping meals, diet pills, vomiting, laxatives or smoking cigarettes, binge-eating) (Croll, Neumark-Sztainer, Story, & Ireland, 2002). These rates were slightly higher among 12th-grade females and males, 57% and 31%, respectively. Sub-clinical eating pathology and maladaptive attitudes are associated with substantial psychological, social, and physiological disturbances (Moor, Vartanian, Touyz, & Beaumont, 2004; Schmidt et al., 2008) and are common precursors to a full diagnosable eating disorder. Indeed, Patton, Coffey, and Sawyer (2003) reported that adolescent females who reported significant dieting at baseline (e.g., frequently skipping meals, restricting calories, avoiding fat, avoiding snacks) were 18 times more likely to develop a diagnosable eating disorder 3
years later than those who did not diet. These data suggest that adolescent eating-disordered behavior is a significant public health problem that warrants significant study.

The purpose of the present study is to explore the potential role that family environment and social-emotional coping skills play in the development of maladaptive eating patterns and attitudes over time in a clinical adolescent sample. It has been well documented that the family environment affects youth psychological and behavioral functioning. A recent review concluded that while families do not appear to play a primary causal role in eating pathology, dysfunctional family environments and unhealthy parenting can affect the genesis and maintenance of disordered eating (Le Grange, Lock, Loeb, & Nicholls, 2010). Low affection, low communication, change in family structure (e.g., a parent leaving), high parental expectations, low parental contact, family criticism about shape and weight, and over- or under-involvement (Botta & Dumlao, 2002; Graber, Brooks-Gunn, Paifoff, & Warren, 1994; Johnson, Cohen, Kasen, & Brook, 2002; Neumark-Sztainer, Story, Hannan, Beuhring, & Resnick, 2000; Shoebridge & Gowers, 2000; Vidović, Jureša, Begovac, Mahnik, & Tocilj, 2005; Welch, Doll, & Fairburn, 1997) have all been associated with disordered eating in adolescents. Much less research exists on whether parental mental health problems, which can have a profound effect on the family environment, play a role in adolescent disordered eating behaviors.

Parental depression has been identified as a vulnerability factor for the development of youth mental health problems (Nelson, Hammen, Brennan, & Ullman, 2003). Depression can interfere with a parent’s sensitivity and ability to attend to a
child’s behavioral, interpersonal, or emotional needs (Rutter, 1990). For example, maternal and paternal depression have been associated with negative parent–child affective quality, disrupted family management practices (e.g., using coercion to control a child’s behavior) (Downey & Coyne, 1990) and poorer parent-child communication (e.g., greater expression of criticism, rejection, and negative affect) (Goodman, Adamson, Riniti, & Cole, 1994; Gordon et al., 1989; Radke-Yarrow, Nottelman, Belmont, & Welsh, 1993). Parental depression may also hinder the development of a healthy attachment style with a child (Allen, Hauser, & Borman-Spurrell, 1996; Brenning, Soenens, Braet, & Bosmans, 2012), which is particularly important given the well established association between eating pathology and insecure attachment styles in adolescents (Brown & Wright, 2001; Dallos & Denford, 2008; Salzman, 1997; Brown & Wright, 2003).

Given the effect of parental depression on the family environment, it is not surprising that it has been associated with eating disordered behavior. Using case control designs, Fairburn, Doll, Welch, Hay, Davies, and O’Conner (1997) and Fairburn, Welch, Doll, Davies, and O’Connor (1998) found that adults with eating disorders (binge eating and bulimia) were more likely to have a parent with depression than psychologically healthy individuals. In a case control study conducted with adolescents, Fairburn, Cooper, Doll, and Welch (1999) found a trend toward a higher rate of parental depression among adolescents with anorexia than psychologically healthy controls. Studies have also found an association between parental depression and severity of eating disordered symptoms. In a study that included 35 adolescents and young adults with anorexia, purging subtype, Strober, Salkin, Borroughs, and Morrell (1982) found that maternal
depression was associated with greater severity of anorexia symptoms. Similarly, in a study that included 94 women with bulimia, Arikian, Keel, Miller, Thuras, Mitchell, and Crow (2007) found that those who reported that their mothers were depressed during their adolescence, were more likely to report worse eating disordered behavior into adulthood. Finally, in a case-control study with 120 pre-adolescents, those with loss of control eating (i.e., eating a large amount of food accompanied by a sense of loss of control over eating) were more likely to have a parent with depression that those with normal eating patterns (Hartmann, Czaja, Rief, and Hilbert, 2012).

Parental anxiety has also been associated with adolescent mental health problems and maladjustment (Berg-Nielsen, Vikan, Dahl, 2002; Silverman, Cerny, Nelles, & Burke, 1988), including child and adolescent anxiety (Beidel & Turner, 1997; Merikangas & Dierker, 1998; Turner, Beidel, & Costello, 1987) and depression (Burstein, Ginsburg, & Tein, 2010). Only one study has examined the relationship between parental anxiety and disordered eating behavior. In a college female sample, McGrane and Carr (2008) found that women at risk for an eating disorder (as per scores on the Eating Disorder Inventory – 2; Garner, 1991) reported greater perceived parental anxiety than age and SES matched controls. Also notable is that parental anxiety has been associated with child directed criticism (Hirshfeld, Biederman, Brody, Faraone, & Rosenbaum, 1997), which has been associated with adolescent disordered eating (Graber et al., 1994).

As evidenced in the studies described above, parental mental health can have a significant impact on child and adolescent mental health and well-being, including disordered eating. However, not all children of parents with depression or anxiety
develop problems such as an eating disorder; hence, it is important to examine factors that may increase or decrease the likelihood of this maladaptive outcome. One factor that may play a role in this relationship is social-emotional coping skills. Youth with poor social-emotional skills may develop maladaptive methods to cope with difficult emotions and problems. Disordered eating behavior itself has been conceptualized as a coping mechanism; in particular, as a way to escape or manage negative emotions (Heatherton & Baumeister, 1991).

Three major domains of social-emotional coping skills that may increase vulnerability for disordered eating are: 1) emotional awareness and expression (self-awareness of what one is feeling and the ability to express these emotions); 2) emotion regulation (ability to manage and control difficult emotions through affect regulation skills); and 3) adaptability (perceived ability to manage change, adapt, and solve problems). An individual who lacks these skills will be unable to understand, express, and manage emotions in an adaptive way, and struggle to flexibly cope with environmental stressors and changes; hence, will likely be more vulnerable to developing maladaptive coping mechanisms. Indeed, several studies suggest that a relationship exists between each of these types of social-emotional coping skills and disordered eating.

A number of studies have found an association between emotional self-awareness and expression, and disordered eating among adolescents. For example, adolescent girls from the community with high levels of disordered eating have been found to report poorer emotional awareness than those with low or no disordered eating (Sim & Zeman, 2006). Poor emotional awareness was also found to be positively associated with drive...
for thinness, even after taking into account the effects of body dissatisfaction (Sim & Zeman, 2006). Similarly, in a community based case control study that compared adolescent females with depression, bulimia, and no mental health diagnosis, those with bulimia reported poorer emotional awareness and identification skills than both other groups (Sim and Zeman, 2004).

Similar to emotional awareness, a number of studies have also found an association between emotional expression and adolescent eating disordered behavior. Sim and Zeman (2004) found that adolescent females with bulimia relative to healthy controls were more reluctant to express negative emotions. Similarly, Zaitsoff, Geller, and Srikameswaran (2002) found that female high school students with higher (versus lower) eating disorder symptoms reported less emotional expression, particularly anger. In a sample of adolescent females from the community, Buchholz, Henderson, Hounsell, Wagner, Norris, and Spettigue (2007) found that lower emotional expression was associated with eating disorder symptoms.

Alexithymia, another term used to represent emotional self-awareness and expression, has also been associated with eating disordered behavior. Alexithymia is characterized by “difficulty identifying and describing one’s emotions” (Sifneos, 1973). In a study conducted by Zonnevijlle-Bendek, Goozen, Cohen-Kettenis, and Van Elburg (2002), adolescent females with an eating disorder scored significantly higher on a measure of alexithymia relative to healthy adolescent female controls. In a community sample of older adolescents, Karukivi, Hautala, Korpelainen, Haapasalo-Pesu, Liuksila, Joukamaa, and Saarijärvi (2010) found that eating disorder symptoms were more
common in adolescents who were identified as alexithymic relative to those without this characteristic.

Similar to emotional awareness and expression, the ability to manage and regulate ones emotions in the face of stress has also been associated with disordered eating in adolescents. In a study conducted by McLaughlin, Hatzenbuehler, Mennin, and Nolen-Hoekeama (2011), poor emotion regulation was found to predict increases in eating pathology over the course of seven months in a community based sample of adolescents. Poor emotion regulation skills have also been associated with more eating disorder symptoms in cross-sectional research with a community based adolescent sample (Weinberg & Klonsky, 2009). In a study that compared adolescents and young adults (ages 15-25 years) diagnosed with an eating disorder to same aged healthy controls, Pierrehumbert, Bader, Miljkovitch, Mazet, Amar, and Halfon (2002) found that those with an eating disorder had poorer emotion regulation skills than healthy controls.

Various facets of adaptability (the ability to manage change, adapt, and solve problems) have also been associated with disordered eating across several studies. Adolescents with disordered eating (specifically, binge eating) report use of problem-solving coping (i.e., strategies to directly remove or reduce the problem causing distress) less frequently that those who do not report binge eating (Sierra-Baigre, Lemo-Giraldez, Paino, & Fonseca-Pedrero, 2012). Furthermore, in adult populations, several studies suggest that women with eating disorders report lower problem solving ability (Campanelli, Bove, & D’Annunzio, 1993; Etringer, Altmaier,, & Bowers, 1989; Soukup, Beiler, & Terrell, 1990) than those without eating disorders.
As suggested above, there exists ample evidence for an association between several domains of social-emotional coping (emotional awareness and expression skills, emotion regulation skills, and adaptability) and disordered eating among adolescents. There is also some preliminary evidence for an association between parental depression and anxiety and disordered eating in adolescents, albeit potentially through a negative effect on the family environment. Therefore, it stands to reason that adolescents who have parents with depression or anxiety may be at greater risk for developing eating pathology if they have difficulty recognizing, expressing, managing, and/or controlling difficult emotions, and/or solving problems in the face of familial stress, than those with better social-emotional coping skills.

The present study examined whether parental depression and anxiety interact with social-emotional coping skills, to influence change in level of adolescent disordered eating attitudes and behaviors over the course of one year. Specifically, we hypothesized that adolescents with highly anxious and depressed parents would be more likely to develop maladaptive eating attitudes and behaviors than those without anxious and depression parents. Furthermore, we hypothesized that the association between parental mental health problems and adolescent maladaptive eating and body attitudes and behaviors would be stronger among individuals with weaker (versus stronger) social-emotional coping skills, including emotional awareness and expression skills, emotion regulation skills, and adaptability.
Methods

Participants
Participants included 87 adolescents, ages 13 through 18, and their parents (174 total individuals). These families participated in a pilot trial (6 dyads) or randomized clinical trial (81 dyads) that examined the efficacy of a suicide, substance abuse, and HIV prevention program for adolescents in mental health treatment (Project SHAPE).

Families were randomized to a 12 hour prevention workshop plus a 2 hour individualized booster session or an assessment-only control condition. Adolescents across both arms were receiving community based mental health treatment at the time of recruitment.

Inclusion criteria for the study were as follows: adolescent enrollment in mental health treatment, parent and adolescent proficiency in English, and parent and adolescent residing in the same home. Exclusion criteria included a diagnosis of drug or alcohol dependence, current enrollment in a drug or alcohol treatment program, HIV infection, pregnancy, or adolescent cognitive level that would prohibit understanding of study material. The adolescent sample was 61% female (mean age = 15.5). The sample was racially (46.5% Caucasian, 34.9% African-American, and 18.6% “Mixed race/Other”) and ethnically (82.8% non-Hispanic, 17.2% Hispanic) diverse.

Procedure
Participants were recruited via clinical referral from counselor or administrative staff at community mental health centers (27%), a youth shelter (43%), private mental health practices (10%), high school counselors (2%), or juvenile court staff (10%), as well as advertisements posted in local newspapers, on Craigslist, and university listserves (10%) (3% did not specify source of recruitment or referral). Parents and teens interested
in participating in Project SHAPE provided their contact information to a counselor at the recruitment facility or contacted the research team directly based on information provided in the study advertisements or brochure. The doctoral level project director or a graduate-level research assistant, screened parent and teen separately for eligibility via phone or in person and further explained the study. They were informed that the study would consist of four assessment time points, including a baseline and three follow-up assessments (one, six, and twelve months post-baseline). Those randomized to the intervention condition received one and a half day group workshop (12 hours total) plus one booster session one month later (2 hours total) and those randomized to the assessment only control were provided with reading materials on substance use, HIV/STDs, and suicide. Parent and adolescent were also informed that they would each receive between $25 and $75 at each of the four assessments. If eligibility criteria were met, an appointment was made for the baseline assessment, at which time, consent and adolescent assent was obtained. All measures used for the proposed study were completed via a computer questionnaire. This study used data obtained at baseline for all predictor (parental depression and parental anxiety) and moderator (social-emotional coping skills) variables. Baseline and twelve month follow-up data were used for outcome variables. Approximately one-third of participants did not complete the 12-month follow-up; hence, a total of 59 dyads completed both baseline and 12-month follow-up and were included in analyses.
Measures

Demographic Variables. Demographics were assessed by participants’ self-reported gender, age, ethnicity, and race as part of the baseline assessment.

Parental Mental Health: The 6-item self-report Depression and Anxiety subscales of the Brief Symptom Inventory (BSI; Derogotis, 1993) were used to assess depressive and anxiety symptom severity over the last week using a 5-point Likert scale (‘not at all’ to ‘extremely’). Both subscale have strong psychometric properties, including high internal consistency (alpha = .82-88) in the present study.

Social-Emotional Coping Skills. The 6-item self-report Intrapersonal Skills, Stress Management Skills, and Adaptability Skills subscales from the BarOn Emotional Quotient Inventory: Short Youth Version (BarOn EQ-i:YV(S); Bar-On & Parker, 2000) were used to assess emotional awareness and expression, emotion regulation, and adaptability, respectively. This self-report instrument employs a 4-point Likert scale (‘not true of me’ to ‘very much true of me’). Bar-On and Parker (2000) report 3 week test-retest subscale reliabilities ranging from .84 to .88.

Eating Disorder Attitudes and Behaviors. The 13-item Dieting subscale of the Eating Attitudes Test (EAT-26; Garner, Olmsted, Bohr, & Garfinkel, 1982) was used to assess extreme dieting attitudes and behaviors and body shape preoccupation associated with eating disorders at baseline and 12-month follow-up. Each item is rated on a 6-point Likert scale (‘never’ to ‘always’). It had high internal consistency, ranging from .80 to .84 across the three time points, in this study. According to Garner et al (1982), given the Dieting subscale’s high correlation with the EAT-26 total, it may be used as an “economical substitute for the total scale”.
Results

Descriptive Statistics

Descriptive statistics for measures of parental depression, parental anxiety, emotion awareness and expression, emotion regulation, adaptability, and disordered eating attitudes and behaviors are presented in Table 5.

Table 5: Descriptive Statistics and Bivariate Correlations of Study Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>Range</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
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<td>1. BSI – Depression*</td>
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<td>.61</td>
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<td>-</td>
<td>-.67*</td>
<td>-.38**</td>
<td>-.11</td>
<td>-.19</td>
<td>-.13</td>
<td>.05</td>
</tr>
<tr>
<td>2. BSI – Anxiety*</td>
<td>.35</td>
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<td>0-2.0</td>
<td>-</td>
<td>.27*</td>
<td>.02</td>
<td>.23*</td>
<td>.14</td>
<td>-.13</td>
<td></td>
</tr>
<tr>
<td>3. Emotion Awareness (EQi – Inttrapersonal)</td>
<td>13.61</td>
<td>4.30</td>
<td>6-23</td>
<td>-</td>
<td>.15</td>
<td>.11</td>
<td>-.15</td>
<td>-.16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Emotion Regulation (EQi – Stress Management)</td>
<td>16.76</td>
<td>4.71</td>
<td>6-24</td>
<td>-</td>
<td>-.34**</td>
<td>-.38*</td>
<td>.17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Adaptability (EQi – Adaptability)</td>
<td>17.34</td>
<td>3.92</td>
<td>6-24</td>
<td>-</td>
<td>.20</td>
<td>-.02</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. 12-mo EAT-26 – Dieting*</td>
<td>4.39</td>
<td>5.93</td>
<td>0-33</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Note: BSI = Brief Symptom Inventory; EQi = Baron Emotional Quotient Inventory; EAT-26 = Eating Attitudes and Behaviors Test – 26
*Correlations for the BSI – Depression computed using the log transformation
**Correlations for the BS – Anxiety computed using the inverse transformation
Correlations for the EAT-26 – Dieting computed using the log transformation
* p < .10, * p < .05, ** p < .01

Preliminary Bivariate Analyses

As scores on some variables were positively skewed (> 2), transformations were conducted to decrease the skew to < 1. A log transformation was used on the EAT-Dieting subscale and the BSI-Depression scale. An inverse transformation was used on the BSI-Anxiety scale. All analyses were conducted with the transformed versions of these variables. All other variables were normally distributed.

Correlation coefficients were computed to examine the bivariate relationships between parental depression, parental anxiety, emotion awareness and expression skills,
emotion regulation skills, and adaptability skills (measured at baseline) and disordered eating attitudes and behaviors (measured at baseline and 12-month follow up) (See Table 5). Among predictor variables, only emotion regulation skills were significantly correlated with eating disorder attitudes and behaviors (in a negative direction) at baseline, but not at 12-month follow up. Baseline and 12-month follow up eating disorder attitudes and behaviors were significantly associated in a positive direction. Bivariate relationships were also examined between demographic variables, hours seen in mental health treatment over the study period, and predictor and outcome variables. Among demographic variables, gender was significantly correlated with eating disorder attitudes and behaviors at baseline, but not at 12-month follow up. Specifically, females reported more eating disorder attitudes and behaviors than males at baseline. No other significant associations were found. T-tests were also conducted to examine whether group differences were present for any of these variables based on intervention condition (prevention workshop or assessment only). No significant differences were found.

**Linear Regression Analyses**

Six separate linear regression analyses were used to examine how each hypothesized predictor (parental depression and parental anxiety) interacts with each hypothesized moderator (emotional awareness and expression skills, emotion regulation skills, and adaptability) to predict eating disorder attitudes and behaviors at 12 months. Baseline EAT-Dieting score was controlled for in the first step of each analysis. The hypothesized predictor and moderator were entered in the second step. Finally, the interaction between the predictor variable and moderator was entered in the third step for
each analysis. All predictor variables were mean centered prior to computing interaction
terms. Hayes and Matthes (2009) MODPROBE procedure was used to probe significant
interactions.

**Linear Regressions – Parental Depression**

The first linear regression analyses examined the relationship between parental
depression, emotion awareness and expression skills, and disordered eating attitudes and
behaviors (See Table 6). There was no main effect of either parental depression ($\beta = -
.03, p = .85$) or emotion awareness and expression skills ($\beta = -.12, p = .36$) on eating
disorder attitudes and behaviors. There was a significant interaction between parental
depression and emotion awareness and expression skills ($\beta = -.25, p < .05$).
MODPROBE analysis indicated that adolescents who had a more depressed parent and
poorer emotion awareness and expression skills reported increased levels of eating
disorder attitudes and behaviors one year later than those who had a more depressed
parent, but stronger emotion awareness and expression skills.
The second linear regression analyses examined the relationship between parental depression, emotion regulation skills, and disordered eating attitudes and behaviors (See Table 6). There was no main effect of either parental depression ($\beta = .18, p = .13$) or emotion regulation skills ($\beta = .04, p = .77$) on eating disorder attitudes and behaviors. There was a significant interaction between parental depression and emotion regulation skills ($\beta = -.35, p < .01$). MODPROBE analysis indicated that individuals who had a more depressed parent and poorer emotion regulation skills reported increased levels of eating disorder attitudes and behaviors one year later than those who a more depressed parent, but stronger emotion regulation skills.

The third linear regression analyses examined the relationship between parental depression, adaptability skills, and disordered eating attitudes and behaviors (See Table 6). There was no main effect of either parental depression ($\beta = .09, p = .45$) or adaptability skills ($\beta = -.12, p = .37$) on eating disorder attitudes and behaviors and there

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**Table 6: Linear Regression Analyses of Parental Depression on EAT-Dieting**

<table>
<thead>
<tr>
<th>Step</th>
<th>Condition</th>
<th>$B$</th>
<th>SEB</th>
<th>$\beta$</th>
<th>$R^2$</th>
<th>$\Delta R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Baseline EAT – Dieting</td>
<td>.51</td>
<td>.12</td>
<td>.48**</td>
<td>.22</td>
<td>.22**</td>
</tr>
<tr>
<td>2</td>
<td>Parental Depression</td>
<td>-.07</td>
<td>.37</td>
<td>-.03</td>
<td>.23</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>Emotion Awareness and Expression</td>
<td>-.01</td>
<td>.01</td>
<td>-.12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Parental Depression X</td>
<td>-.18</td>
<td>.09</td>
<td>-.25*</td>
<td>.28</td>
<td>.05*</td>
</tr>
<tr>
<td></td>
<td>Emotion Awareness and Expression</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Baseline EAT – Dieting</td>
<td>.64</td>
<td>.14</td>
<td>.60**</td>
<td>.22</td>
<td>.22**</td>
</tr>
<tr>
<td>2</td>
<td>Parental Depression</td>
<td>.47</td>
<td>.31</td>
<td>.18</td>
<td>.23</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>Emotion Regulation</td>
<td>.00</td>
<td>.01</td>
<td>.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Parental Depression X</td>
<td>-.25</td>
<td>.08</td>
<td>-.35**</td>
<td>.34</td>
<td>.11**</td>
</tr>
<tr>
<td></td>
<td>Emotion Regulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Baseline EAT – Dieting</td>
<td>.53</td>
<td>.13</td>
<td>.50**</td>
<td>.22</td>
<td>.22**</td>
</tr>
<tr>
<td>2</td>
<td>Parental Depression</td>
<td>.25</td>
<td>.32</td>
<td>.09</td>
<td>.24</td>
<td>.02</td>
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<tr>
<td></td>
<td>Adaptability</td>
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<td>.01</td>
<td>-.12</td>
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</tr>
<tr>
<td>3</td>
<td>Parental Depression X</td>
<td>.04</td>
<td>.08</td>
<td>.06</td>
<td>.24</td>
<td>.00</td>
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<tr>
<td></td>
<td>Adaptability</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

*p < .10, *p < .05, **p < .01
was not a significant interaction between parental depression and adaptability skills ($\beta = .06, p = .65$).

**Linear Regressions - Parental Anxiety**

The fourth linear regression analyses examined the relationship between parental anxiety, emotion awareness and expression skills, and disordered eating attitudes and behaviors (See Table 7). There was no main effect of either parental anxiety ($\beta = -.11, p = .37$) or emotion awareness and expression skills ($\beta = -.06, p = .61$) on eating disorder attitudes and behaviors. There was a significant interaction between parental anxiety and emotion awareness and expression skills ($\beta = .28, p < .05$). MODPROBE analysis indicated that individuals who had a more anxious parent and poorer emotion awareness and expression skills reported increased levels of eating disorder attitudes and behaviors one year later than those who had a more anxious parent, but stronger emotion awareness and expression skills.

**Table 7: Linear Regression Analyses of Parental Anxiety on EAT-Dieting**

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Baseline EAT – Dieting</th>
<th>B</th>
<th>SEB</th>
<th>$\beta$</th>
<th>$R^2$</th>
<th>$\Delta R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 2</td>
<td>Parental Anxiety</td>
<td>.24</td>
<td>.26</td>
<td>-.11</td>
<td>.26</td>
<td>.04</td>
</tr>
<tr>
<td>Step 3</td>
<td>Parental Anxiety X Emotion Awareness and Expression</td>
<td>.01</td>
<td>.01</td>
<td>-.06</td>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Baseline EAT – Dieting</th>
<th>B</th>
<th>SEB</th>
<th>$\beta$</th>
<th>$R^2$</th>
<th>$\Delta R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 2</td>
<td>Parental Anxiety</td>
<td>-.39</td>
<td>.23</td>
<td>-.18</td>
<td>.26</td>
<td>.04</td>
</tr>
<tr>
<td>Step 3</td>
<td>Parental Anxiety X Emotion Regulation</td>
<td>.01</td>
<td>.01</td>
<td>.07</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Baseline EAT – Dieting</th>
<th>B</th>
<th>SEB</th>
<th>$\beta$</th>
<th>$R^2$</th>
<th>$\Delta R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 2</td>
<td>Parental Anxiety</td>
<td>-.45</td>
<td>.25</td>
<td>-.21</td>
<td>.26</td>
<td>.04</td>
</tr>
<tr>
<td>Step 3</td>
<td>Parental Anxiety X Adaptability</td>
<td>-.02</td>
<td>.01</td>
<td>-.17</td>
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</table>

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Baseline EAT – Dieting</th>
<th>B</th>
<th>SEB</th>
<th>$\beta$</th>
<th>$R^2$</th>
<th>$\Delta R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 2</td>
<td>Parental Anxiety</td>
<td>-.15</td>
<td>.07</td>
<td>-.27*</td>
<td>.32</td>
<td>.06*</td>
</tr>
</tbody>
</table>

*p < .10, *p < .05, **p < .01
NOTE: inverse transformation so higher scores reflect lower anxiety
The fifth linear regression analyses examined the relationship between parental anxiety, emotion regulation skills, and disordered eating attitudes and behaviors (See Table 7). There was no main effect of either parental anxiety ($\beta = -.18, p = .11$) or emotion regulation skills ($\beta = .07, p = .54$) on eating disorder attitudes and behaviors. There was a significant interaction between parental anxiety and emotion regulation skills ($\beta = .35, p < .01$). MODPROBE analysis indicated that individuals who had a more anxious parent and poorer emotion regulation skills reported increased levels of eating disorder attitudes and behaviors one year later than those who had a more anxious parent, but stronger emotion regulation skills.

The sixth linear regression analyses examined the relationship between parental anxiety, adaptability skills, and disordered eating attitudes and behaviors (See Table 7). There was a trend towards a main effect of parental anxiety ($\beta = -.21, p = .07$) on eating disorder attitudes and behaviors. There was no main effect for adaptability skills ($\beta = -.17, p = .17$) on eating disorder attitudes and behaviors. There was a significant interaction between parental anxiety and adaptability skills ($\beta = -.27, p < .05$). MODPROBE analysis indicated that individuals who had a less anxious parent and stronger adaptability skills reported decreased levels of eating disorder attitudes and behaviors one year later than those who had a less anxious parent, but weaker adaptability skills.

**Discussion**

This study explored whether parental depression and anxiety interact with social-emotional coping skills (specifically, emotional awareness and expression skills, emotion
regulation skills, and adaptability) to influence change in level of disordered eating attitudes and behaviors over the course of one year in a clinical sample of adolescents. Notably, this question was examined in racially and economically diverse sample with a relatively high percentage of males, whereas the majority of eating disorder studies consist of predominantly female, Caucasian samples. Partial support for study hypotheses was found. While parental depression and anxiety did not directly predict disordered eating attitude and behaviors, they were associated with this outcome in the presence of poor social-emotional coping skills. Specifically, greater parental depression and anxiety were only associated with increased disordered eating attitudes and behaviors among adolescents who reported poorer emotional awareness/expression skills and less ability to adaptively regulate emotions. These results may suggest that adolescents who lack the social-emotional coping skills needed to navigate the potential negative effects of parental depression and anxiety (e.g., poorer parent-child communication, child-directed criticism, under and/or over parental involvement), may be more likely to engage in maladaptive coping behaviors, such as disordered eating, as a means to manage associated distress and negative emotions (Heatherton & Baumeister, 1991).

Interestingly, the relationship between parental mental health problems, adaptability, and disordered eating was less straightforward. Only parental anxiety, not parental depression, interacted with adolescent adaptability to predict severity of disordered eating attitudes and behaviors. Moreover, in this model, lower parental anxiety predicted decreased disordered eating attitudes and behaviors among highly adaptable individuals. Hence, it appears that stronger adaptability or problem solving
skills may help protect against disordered eating symptoms, but only when the adolescent has a parent with minimal anxiety.

It is notable that the social-emotional coping deficits that had the strongest negative influence on the increase of disordered eating attitudes and behaviors among adolescents in the presence of parental depression or anxiety were those domains most directly tied to emotions (i.e., emotional awareness and expression and emotion regulation), emphasizing the key role that emotions play in disordered eating. In contrast, adaptability, which reflects perceived problem-solving ability and does not have a significant emotional component, did not affect level of disordered eating in the presence of a highly anxious parent. Rather, it served a protective effect in the presence of a minimally anxious parent.

Interestingly, the present study failed to find a significant direct association between parental mental health or any domain of social-emotional coping and eating disorder attitudes and behaviors, after controlling for baselines levels of eating behavior. These findings are inconsistent with previous research (Fairburn et al., 1997; 1998; 1999; McLaughlin et al., 2011; McGrane & Carr, 2008; Sierra-Baigne et al., 2012; Sim & Zeman, 2006) and may, in part, be due to the relatively low levels of eating pathology in the sample as a whole as well as the inclusion of males. The level of eating disorder attitudes and behaviors was somewhat lower in the present study relative to previously reported adolescent norms, which in turn reduced range and variability of scores. The mean score of the EAT-Dietering scale in our sample was 4.0 and 4.3 at baseline and 12 months (range 0 to 33). The mean score for females was 4.8 and 5.3 (range 0 to 33) at
each of the respective time points and for males was 2.9 and 2.6 (range 0 to 15) at each of the respective time points. A study of over 1,300 high school students found a mean of 7.9 (SD=8.0) for females and 2.8 (SD=2.6) for males on the EAT-Dieting scale (Rosen, Silberg, & Gross, 1988). While the males in our study scored in a comparable range, the mean score for females was notably lower than reported norms. Levels of disordered eating attitudes and behaviors may have been lower in our sample because parents who enrolled their adolescents our study were most concerned about adolescent substance use, suicidality, and risky sexual behavior (the focus of the intervention study from which our data was collected) rather than disordered eating. Additionally, all participants were already in mental health treatment; hence, they may have already been getting help for emotional concerns which may have decreased the likelihood of developing eating pathology. Given that the vast majority of eating disorder studies include only females, our inclusion of males may also help explain our failure to find a relationship between parental mental health and adolescent disordered eating symptoms. While we were unable to examine our hypotheses separately for males and females due to our sample size, this is an important avenue to explore in future research.

**Clinical Implications**

Results of this study hold several important clinical implications. Clinically, results suggest that adolescents who present for mental health treatment may be at risk for disordered eating if they have a parent suffering from anxiety or depression and they lack healthy social-emotional coping skills. Skills that seem to be particularly important are ability to be aware of and express emotions and ability to regulate emotions. Therefore,
it is important for clinicians to gather a thorough history of parental mental health and assess for these social-emotional coping skills. Furthermore, emotional awareness and expression and emotion regulation may be important targets for intervention. If an adolescent is able to understand his or her emotions, express them in a healthy way, and regulate them as needed, the adolescent may be less likely to turn to disordered eating as way to express or cope with his or distress.

**Limitations**
While the current results offer new and important data for understanding how parental mental health and social-emotional coping skills relate to eating disorder attitudes and behaviors, several limitations deserve mention. First, because the study involved only adolescents in mental health outpatient treatment, results may not readily apply to other populations. A second limitation is that the rate of eating disorder attitudes and behavior present in the sample was relatively low. Therefore, results may not apply to samples with greater eating pathology. Third, the sample size was relatively small. However, the fact that interactions were found in a sample of this size attests to the strength of these findings.

**Future Research**
Findings from this study suggest several directions for future research. While there was adequate power to detect significant results, our sample size was relatively small and it would be valuable to replicate this study in a larger, more diverse sample. Additionally, these data were gathered in the context of a clinical intervention study; and while the intervention was not designed to address eating nor was there an association
between disordered eating symptoms and treatment condition, it would be beneficial to conduct similar analyses outside the context of an intervention study. Lastly, it would be interesting to test our hypotheses in a clinical population of individuals with eating disorders to determine whether the models examined in the present study receive support among those with more severe eating pathology. Such information may further improve our understanding of the manner in which parental mental health problems and social-emotional coping skills contribute to the development and maintenance of eating disorder behaviors and attitudes.
APPENDIX A

Background and Literature on Disordered Eating, Maladaptive Parenting, and Emotional-Social Intelligence

In the United States, approximately 10 million individuals suffer from a clinically significant eating disorder at some time in their life, including anorexia nervosa, bulimia nervosa, or binge eating disorder, with lifetime prevalence rates ranging from 0.6% to 4.5% (Hudson, Hiripi, Pope, & Kessler, 2007). These disorders are associated with high relapse rates, emotional distress, medical complications, and functional impairment. Furthermore, eating disorders are often co-morbid with other psychiatric disorders, such as depression (Mangweth, Hudson, Pope, Hausmann, De Col, Laird, & Tsuang, 2003), generalized anxiety (Kaye, Bulik, Thorton, Barbarich, & Masters, 2004), OCD (Altman & Shankman, 2009), and substance abuse (Harrop & Marlatt, 2010). Physiological consequences of eating disorders include serious cardiovascular and neurological problems, bone loss, kidney failure, gastrointestinal complications, and overall impaired physical development (Kreipe, Golden, Katzman, Fisher, Rees, Tonkin, et al., 1995). The medical complications of anorexia nervosa are especially severe; this disorder has the highest mortality rate of any psychiatric disorder (Arcelus, Mitchell, Wales, & Nielsen, 2011) and is associated with a 50-fold increase in the relative risk of death from suicide (Keel, Dorer, Eddy, Franko, Charatan, & Herzog, 2003). It is clear that eating disorders can have a devastating impact on patients and their families. There is also increasing
evidence that eating disorders cut across race, gender, socioeconomic status and sexual orientation (Wade, Keski-Rahkonen & Hudson, 2011). In fact, the prevalence of eating disorders is similar among Non-Hispanic Whites, Hispanics, African-Americans, and Asians in the United States, with the exception anorexia nervosa, which is more common among Non-Hispanic Whites (Hudson et al., 2007; Wade et al., 2011).

There is an even larger number of people who report disturbed eating behaviors and attitudes (e.g., desire to lose weight, fear of being over weight, guilt over eating, preoccupation with food and weight, undue influence of body shape and weight on self-evaluation) that do not fall neatly into a particular diagnostic category. Sub-clinical eating pathology and related maladaptive attitudes have also been associated with substantial psychological, social, and physiological disturbances (Moor, Vartanian, Touyz, & Beaumont, 2004; Schmidt, Lee, Perkins, Eisler, Tresure, Beechum, et al., 2008).

Furthermore, sub-clinical eating pathology can be a precursor to a full diagnosable eating disorder. In a three-year follow up study, Patton, Coffey, and Sawyer (2003) reported that adolescent females who had severely dieted at baseline (e.g., frequently skipping meals, restricting calories, avoiding fat, avoiding snacks) were 18 times more likely to develop a diagnosable eating disorder 3 years later than those who did not diet.

Eating disorders are frequently first diagnosed during adolescence. Adolescence represents a particularly vulnerable time for the development of mental health problems. During adolescence, significant changes occur in brain development, endocrinology, emotions, cognition, behavior, and interpersonal relationships (Evans & Seligman, 2005). Adolescents encounter new developmental challenges related to becoming more
autonomous and forming an identity. A large part of the developmental process involves adapting, with increased cognitive ability and social understanding, to a changing body (Erikson, 1980).

Together, these factors converge to increase vulnerability for developing disordered eating habits, particularly when a genetic risk is present. Recent research suggests that additive genetic factors account for approximately 40% to 60% of liability to diagnosable eating disorders (Trace, Baker, Peñas-Lledó, & Bulik, 2013). Eating disorders and disturbances are so prevalent in adolescents, that they comprise the third most common chronic illness, after obesity and asthma (Fisher, Golden, Kreipe, Rees, Schebendach, Katzman, et al., 1995). Just as concerning is the prevalence of sub-clinical eating pathology, which comprises the majority of all cases in outpatient settings (Fairburn & Bohn, 2005). In a study that included over 80,000 ninth and twelfth graders, 56% of 9th-grade females and 28% of 9th-grade males reported disordered eating behaviors (i.e., one or more of the following to lose or control weight: fasting or skipping meals, diet pills, vomiting, laxatives or smoking cigarettes; and binge-eating) (Croll, Neumark-Sztainer, Story, & Ireland, 2002). These rates were slightly higher among 12th-grade females and males, 57% and 31%, respectively. While most adolescents with subclinical eating pathology seem to recover, for 10-33% of these individuals, these disordered eating patterns persist into adulthood (Chamay-Weber, Narring, & Michaud, 2005).

Though both males and females report eating pathology at alarmingly high rates, they share some, but not all, risk factors for this behavior. Male and female adolescents
with eating pathology report similar physiologic and psychological characteristics, age of onset and premorbid characteristics, psychiatric comorbidity, and susceptibility to parental and media influence (Croll et al., 2002; Muise, Stein, & Arbess, 2003).

However, there are higher rates of diagnosable and sub-clinical eating disorders among adolescent females compared to males (Croll et al., 2002; Patton et al., 1997; Stice, Shaw, & Ochner, 2011). Notably, the rate of disordered eating in males has been steadily increasing. While this may be a result of an actual increase in eating problems in males, it also may reflect a higher rate of reporting these problems than in the past. Additionally, some studies have found gender-based differences in correlates of disordered eating. In a community based study conducted with over 80,000 adolescents, Croll et al. (2002) found that, 73% of females with disordered eating reported strong appearance concerns in comparison to 41% of males with disordered eating. Some research also shows that males and females differ with respect to why they report being dissatisfied with their body; specifically, some males desire to be bigger and more muscular rather than thinner which is most common among females (Furnham & Calnan, 1998). A review article of disordered eating in adolescent males suggests that obesity and involvement in sports may present a greater risk for eating disorders in males than in females (Muise et al., 2003).

A few studies have explored gender differences in developmental trajectories of eating problems over time in adolescents. While most studies that examine change in eating pathology over time aggregate all data to identify one developmental pathway, developmental trajectory studies are unique in that they identify multiple developmental
pathways of disordered eating. They allow for an exploration of within person changes over time as well as between person variability in eating related trajectories when examining the influence of socio-demographic variables, such as gender, and other risk factors, on these trajectories. In a community sample of 739 adolescents ages 13 to 18, Aime, Craig, Pepler, Jiang, & Connolly (2008) identified five trajectories of disordered eating based on yearly assessments over the course of four years. Specifically, these trajectories included no eating problems (58.5%), some eating problems (21.9%), increasing from some to a high level of eating problems (3.9%), decreasing from a high level of eating problems to some eating problems (10.1%), and chronically high level of eating problems (5.5%). Predictor variables that were examined included externalizing problems (characterized by attention, oppositional, antisocial, and aggressive problems), internalizing problems (characterized by inhibition and over-control), substance use, peer victimization, and depression. Generally, there were differences between the “no eating problems” group and the other four groups for most psychological correlates, but few differences between the four groups that reported at least some level of disordered eating. There were several interesting findings related to gender differences. While males were more likely to belong to the group with “no eating problems” and less likely to belong to the group with “some”, “chronic high”, and “decreasing from high to some” eating problems, there were no significant differences in the proportion of males and females in the “increasing” problem eating group. Additionally, in males, eating problems and depression tended to co-occur, while in females, depressive symptoms did not vary over
time in a consistent pattern with variations in eating pathology; hence depressive symptoms were not predictive of changes in eating pathology for females.

In a study of a community sample of 1050 adolescents in grades nine through eleven, Fay and Lerner (2013) identified six trajectories for level of ‘drive for thinness’ (i.e. an excessive concern with dieting, preoccupation with weight, and fear of weight gain) and five trajectories for body dissatisfaction based on yearly assessments over the course of three years. The drive for thinness trajectories identified included a very low stable level (13.3%), low stable level (36.6%), increasing from a low to a moderate level (9.5%), decreasing from a moderate to a low level (21.5%), increasing from a moderate level to a high level and then decreasing back to a moderate level (13.5%), and high stable level (5.5%) of drive for thinness. The five trajectories for level of body dissatisfaction identified, all of which were stable across three years, included none (4.6%), a very low level (36.6%), a low level (33.4%), a moderate level (21.2%), and a high level (4.3%) of body dissatisfaction. With regard to correlates of the six different ‘drive for thinness’ trajectories, gender, weight perception, and level of self-esteem distinguished several of the trajectories. With regard to the five different body dissatisfaction trajectories, these same correlates (gender, weight perception, and self-esteem) as well as BMI distinguished several of the trajectories. In general, adolescents who were male, perceived themselves to be a normal weight, and reported higher levels of self-esteem were more likely to have a favorable trajectory of ‘drive for thinness’ and body dissatisfaction. In contrast, adolescents who were female, perceived themselves as overweight, had a higher BMI, and reported lower self esteem were more likely to have
overall higher levels of ‘drive for thinness’ and body dissatisfaction. Sports participation did not distinguish different ‘drive for thinness’ trajectories or different body dissatisfaction trajectories.

Though males were not included, one additional longitudinal trajectory based study examined the effects of thinness and eating expectancies in a community sample of 394 7th to 9th grade females. Smith, Simmons, Flory, Annus, and Hill (2007) found four trajectories of binge eating frequency based on annual assessments over the course of three years. Specifically, these were none, stable (76.6%), moderate stable level (12.2%), a high decreasing to moderate level (3.6%), and a low increasing to moderate level (7.6%) of binge eating. Both eating and thinness expectancies differentiated the group of non-binge eating girls from the group who began with little binge eating and increased their binge eating during the study period. Smith et al. (2007) also examined changes in frequency of purging and found four trajectories. They included none, stable (5.8%), moderate, stable (9.4%), high stable (1.0%), and increasing from low to moderate/high (7.6%). Thinness expectancies differentiated the non-purging group from the group that began with minimal purging behavior and increased their purging over time.

As is evident, gender plays a role in the development of eating pathology, and thus, it is important to attend to gender differences in the adolescent eating disorder literature. The remainder of this literature review will focus on malleable and prominent environmental and intra-individual psychological risk factors for disordered eating among adolescents, with close attention to gender differences. Specifically, a review of research studies that have explored the extent to which several parent-related
environmental risk factors (parental depression, poor parental monitoring, and emotional abuse) affect disordered eating among adolescents follows. This is followed by a review of studies that have examined the role that a set of intra-individual psychological factors, namely aspects of emotional-social intelligence (a measure of social emotional competence), play in the development of disordered eating among adolescents.

**Parent-related Environmental Risk Factors for Disordered Eating**

**Introduction to Parental Environment Factors**

It is well known that the early parenting environment affects the development of psychological and behavioral functioning. A recent review that examined the role of family in the development of eating disorders concluded that families do not play a primary causal role in eating pathology and there is not one profile or “type” of family that causes eating disorders (Le Grange, Lock, Loeb, & Nicholls, 2010). However, as evidenced through the studies below, it is clear that dysfunctional family environments and unhealthy parenting can play a role in the genesis and maintenance of disordered eating (Le Grange et al., 2010).

Research has suggested that a range of parental factors may play a role in eating disorders. For example, using a longitudinal study design, Johnson, Cohen, Kasen, and Brook (2002) found that low paternal affection, low paternal communication, and low paternal time spent with one’s child, as well as low parental education, were each negatively associated with one or more type of eating or weight problems in offspring during adolescence or early adulthood. Community based retrospective studies have found that change in family structure (e.g., a parent leaving) (Welch, Doll, & Fairburn,
1997), high parental expectations, low parental contact, and more family criticism about shape and weight (Graber, Brooks-Gunn, Paifoff, & Warren, 1994), were found more commonly in families with an adolescent who developed bulimia nervosa relative to those with healthy adolescents. Another community based study involving nearly 10,000 adolescents found that youth who perceived family communication, parental caring, and parental expectations were at increased risk for disordered eating (Neumark-Sztainer, Story, Hannan, Beuhring, & Resnick, 2000).

In comparing the developmental history of young adults with and without anorexia nervosa, Graber et al. (1994) found that those with anorexia experienced more parental problems (i.e., separation, arguments, criticism, high expectations, over- or under-involvement, low affection and critical comments about shape, weight, or eating) compared to healthy controls. In another study comparing patients with anorexia nervosa to controls, researchers found that early-life “overprotective/high-concern” parenting behaviors were more common in mothers of those with anorexia nervosa (Shoebridge & Gowers, 2000). This same study found that parental indifference, family discord, and lack of parental care was greater in individuals with bulimia nervosa and mixed anorexia/bulimia compared to normal controls. In a study involving individuals with eating disorders and their mothers, both eating disorder patients and their mothers reported poorer family cohesion and impaired mother-daughter communication (Vidović, Jureša, Begovac, Mahnik, & Tociłj, 2005). Poor father-daughter communication has also been implicated as a correlate of disordered eating among college females (Botta & Dumlao, 2002).
In summary, there is clear evidence to suggest that the early rearing environment plays a role in the development and/or maintenance of eating disordered behavior, such that unhealthy parenting (e.g., criticism, under-or over-involvement, poor communication) may influence eating disordered behavior among offspring. Less research exists on whether factors such as parental monitoring, parental depression, and childhood emotional abuse play a role in adolescent disordered eating attitudes and behaviors. Below is a review of relevant literature in each of these areas.

**Poor Parental Monitoring**

One important parental factor that affects the parent-adolescent relationship and healthy youth development is poor parental monitoring. Overall, parental monitoring is defined as “knowledge that parents have about their children’s activities outside the home which is obtained through active parental efforts to find out what their children are doing as well as children’s spontaneous and willing divulgence of information” and encompasses four components (Statton & Kerr, 2000). Three of these domains reflect parental *sources of knowledge* about their child’s daily life (e.g. who the child is with, what they are doing, where they are). These three components include: 1) **child disclosure** of information, 2) **parent solicitation** of information, and 3) **parental control** over whether the child provides information about his or her whereabouts. It is important to note that the third component, parental control, does *not* refer to psychological control (i.e., coercive, non-democratic discipline and psychological manipulative strategies used to control the child’s behavior). The fourth component, **parental knowledge** (defined broadly as parental monitoring in most research studies), specifically refers to parents’
actual knowledge of child’s whereabouts and daily activities. [To avoid confusion, in the studies reviewed below, the fourth component of parental monitoring will be referred to as “parental knowledge”.] Parents who fail to adequately monitor their children tend to be less involved in their adolescents’ lives and thus less likely to be knowledgeable about difficulties (i.e., peer problems, mental health problems, academic difficulties, substance use, etc.).

It is important to note that the majority of the studies described below only capture one component of parental monitoring (as defined above by Stattin and Kerr, 2000). Generally, research suggests that poor parental monitoring is associated with a range of negative outcomes, particularly externalizing behavior problems, for adolescents. In a study conducted with a large sample of adolescents from the community, Fletcher, Steinberg, and Williams-Wheeler (2004) found that low parental solicitation of information was associated with problem behaviors, including substance use and involvement in delinquent activities (e.g., carrying a weapon, vandalism, theft, and using a phony ID). Another study conducted with a group of 14-year-old community adolescents found that greater parental knowledge was associated with fewer antisocial behavior problems and greater relationship enjoyment and involvement (Laird, Pettit, Dodge, & Bates, 2003). In a study involving adolescents in psychiatric care, Donenberg, Wilson, Emerson, and Bryant (2002) found that higher parental knowledge was associated with lower levels of risky sexual behavior. In a longitudinal study conducted by Laird, Pettit, Bates, & Dodge (2003), low levels of parental knowledge predicted increases in delinquent behavior over time in community adolescents. Several other
cross-sectional and longitudinal studies similarly support the assertion that poor parental knowledge is associated with and predictive of more adolescent externalizing behaviors (Bowman, PRElow, & Weaver, 2007; Buehler, Benson, & Gerard, 2006; Donenberg et al., 2002; Elgar, Mills, McGrath, Easchbusch, & Brownridge, 2007; Formoso, Gonzales, & Aiken, 2000; Fosco, Stormshak, Dishion, & Winter, 2012; Fulkerson, Pasch, Perry, & Komro, 2008; Kim, Hetherington, & Reiss, 1999; Laird, Criss, Pettit, Dodge, & Bates, 2008; Stattin & Kerr, 2000; Van Loon, Van de Ven., Van Doesum, Witteman, & Hosman, 2013; Vieno, Nation, Pastore, & Santinello, 2009; Walton & Fouri, 2010; Wang, Stanton, Li, Cottrell, Deveaux, & Kaljee; 2013; Wiesner & Silbereisen, 2003).

There is less research supporting the relationship between poor parental monitoring and internalizing behavior. Most studies conducted in this area have examined the association between parental knowledge and internalizing symptoms. In a study conducted by Jacobson and Crockett (2000) with seventh to twelfth graders from the community, parental knowledge had a strong negative association with depressed mood; however, this was only apparent in girls, not boys. Blodgett, Gondoli, Corning, McEnery, and Grundy (2007) found that, in middle school female adolescents, lower maternal knowledge was predictive of anxiety and depression one year later. In a sample of Mexican adolescents from the community, Gil-Rivas, Greenberger, Chuansheng, and Lopez-Lena (2003) found that higher levels of parental knowledge were associated with lower levels of depressed mood. Similarly, in a study conducted by Buehler et al., (2006), low parental knowledge was associated with higher levels of internalizing behaviors in a community sample of adolescents. King, Schwab-Stone, Flisher, Greenwald, Kramer,
Goodman, and Gould et al. (2001) found that low parental knowledge was associated with higher levels of suicidal ideation in a community sample of children and adolescents (age 9-17). Only one study failed to find any association between parental knowledge and internalizing symptoms. In a study including adolescents with a mentally ill parent, Van Loon et al. (2013) found an association between low parental knowledge and externalizing, but not internalizing behaviors.

Only a handful of studies have examined the association between other components of parental monitoring and adolescent internalizing symptoms. In a study that included high school adolescents from Italy, parental solicitation and child disclosure was negatively associated with anxiety and depression, but only in females (Bacchini, Miranda, & Affuso, 2011). Using a longitudinal study design with adolescents from the community, Elgar et al.’s (2007) found that higher parental control was predictive of lower levels of internalizing problems two years later. Similarly, in a group of adolescents from the community, Barber, Olsen, and Shagle (1994) found that low parental control was related to internalizing problems. Overall, there is some evidence to suggest that parental monitoring may play a less significant role in internalizing problems for boys relative to girls. It is also possible that parental monitoring may be more strongly associated with internalizing symptoms in the presence of other psychological vulnerability factors.

To date, only a handful of studies have examined the association between various components of parental monitoring and disordered eating. Most have examined the role of parental knowledge in eating disordered behavior. Specifically, in a study with 2793
racial/ethnically and socio-economically diverse adolescents, Berge, Wall, Larson, Eisenberg, Loth, and Neumark-Sztainer (2012) found that greater parental knowledge was associated with lower odds of engaging in dieting and disordered eating behaviors. In a longitudinal study that included 191 community adolescents and their parents, May, Kim, McHale, and Crouter (2006) found that increases in girls’ weight concerns were linked to decreases in maternal knowledge, but not paternal knowledge, over the course of three years. For boys, no significant relationship was found between parent knowledge and eating behaviors. In a sample of 363 middle-school girls, McVey, Pepler, Davis, Flett, and Abdolell (2002) found that higher paternal (but not maternal) involvement (e.g., the degree to which parents are interested in, knowledgeable about, and spend time relating to their children concerning activities and experiences) was a protective factor against disordered eating.

Two studies have examined other components of parental monitoring in relation to disordered eating. In a sample of 428 Dutch families, Snoek et al. (2010) found that adolescent, but not parent, report of low parental solicitation and control was associated with higher emotional eating. In a group of 4625 adolescent females who participated in a state-wide health survey, Fonseca, Ireland, and Resnick (2002) found that higher parental control was a protective factor against extreme weight control behaviors (i.e., vomiting, taking laxatives, diet pills, or diuretics) in females. Interestingly, control was a risk factor for extreme weight control behaviors in males.

Taken together, these results suggest that higher levels of parental monitoring is a protective factor, while lower levels of parental monitoring is a risk factor for eating
disordered behavior in adolescents; and this relationship may be different for females than males. With regard to disordered eating, it stands to reason that parents who do not adequately monitor their adolescents may be less aware of the presence of disordered eating patterns. Thus, they may be less likely to intervene and seek needed help. Parental monitoring reflects parents’ involvement in adolescents’ lives. As discussed earlier, research suggests that parents’ over- or under-involvement is associated with eating pathology (Graber et al., 1994; Johnson et al., 2002; Shoebridge & Gowers, 2000). Adequate parental monitoring may be a marker of healthy involvement. Furthermore, since parental monitoring encompasses aspects of communication (i.e., parent solicitation of information and adolescent disclosure of information) poor parental monitoring may reflect a more distant relationship between a parent and their adolescent. In fact, parental knowledge, one component of monitoring, has been shown to be associated with the quality of the parent–child relationship (Dishion & McMahon, 1998). Hence, an adolescent may not feel comfortable reaching out for help or support if he or she experiences any of the common difficulties that can be precursors to disordered eating (e.g., teasing about shape or weight, negative body image, low self-esteem, difficulty coping with high stress and negative emotions).

**Parental Depression**

Another parental factor that has been identified as a vulnerability factor for the development of youth mental health problems is parental depression (Nelson, Hammen, Brennan, & Ullman, 2003). Depression can interfere with a parent’s sensitivity to and ability to attend to a child’s behavioral, interpersonal, or emotional needs (Rutter, 1990).
Maternal and paternal depression is associated with parenting deficits, such as negative parent–child affective quality and disrupted family management practices (Downey & Coyne, 1990). Research has shown that depressed parents are more critical, rejecting, and express more negative affect toward their child (Goodman, Adamson, Riniti, & Cole, 1994; Gordon et al., 1989; Radke-Yarrow, Nottelman, Belmont, & Welsh, 1993). Parental depression may also interfere with adequate monitoring, which (as described above) is a risk factor for child psychopathology. Additionally, parental depression may hinder the development of a healthy attachment style with their child, which has been shown to be associated with a range of developmental and mental health difficulties (Allen, Hauser, & Borman-Spurrell, 1996; Brenning, Soenens, Braet, & Bosmans, 2012), including severe psychopathology (Rosenstein & Horowitz, 1996). Notably, much research has demonstrated an association between eating pathology and insecure attachment styles in adolescents (Brown & Wright, 2001; Dallos & Denford, 2008; Salzman, 1997; Brown & Wright, 2003).

Research has shown that parental depression is associated with both internalizing and externalizing problems among adolescents. Adolescents with a depressed parent have a more difficult time coping with life stressors and are more likely to suffer from depression (Bouma, Ormel, Verhulst, & Oldehinkel, 2008; Lieb, Isensee, Hofler, Pfister, & Wittchen, 2002). Remission of a parent’s depression has been shown to be associated with an increase in healthy functioning in their adolescent (Garber, McCauley, Diamond, & Schloredt, 2011). Additionally, parental depression has been associated with both suicidal ideation and completed suicide in adolescents (Brent, Perper, Moritz, Liotus,
Adolescents whose mothers are depressed have been shown to have more school problems, be less socially competent, and have lower self-esteem (Gotlib & Goodman, 1999; Nelson, Hammen, Brennan, & Ullman, 2003). They are also at risk for substance use (Weissman, Wickramaratne, Moreau, & Olfson, 1997). While genetics may account for part of the transmission of depression from parent to child, the environmental also plays a significant role. This is exemplified in a study conducted by Tully, Iacono, and McGue (2006) with 568 adopted adolescents and 416 non-adopted adolescents. Regardless of adoption status, those whose mothers’ had major depression were found to be at a significantly greater risk for major depression and disruptive behavior disorders.

With regard to disordered eating, research has shown that parental depression is associated with eating disorders. In a case control study conducted by Fairburn, Welch, Doll, Davies, and O’Connor (1997), he found that individuals with bulimia were more likely to have a parent with depression than psychologically healthy individuals or those with other psychiatric disorders. Similarly, in a second case control study, Fairburn, Doll, Welch, Hay, Davies, and O’Connor (1998) found that individuals with binge eating disorder were more likely to have a parent with depression than psychologically healthy individuals. It is important to note that both of these studies included young adults rather than adolescent participants. However, in a third case control study, Fairburn, Cooper, Doll, and Welch (1999) used an adolescent sample and found a trend toward a higher rate of parental depression among adolescents with anorexia than psychologically healthy controls.
Studies have also found an association between parental depression and severity of eating disordered symptoms. In a study that included 35 adolescents and young adults with anorexia, purging subtype, Strober, Salkin, Borroughs, and Morrell (1982) found that maternal depression was associated with greater severity of anorexia symptoms. Similarly, in a study that included 94 women with bulimia, Arikian, Keel, Miller, Thuras, Mitchell, and Crow (2007) found that those who reported that their mothers were depressed during their adolescence, were more likely to report worse eating disordered behavior into adulthood. In a case-control study involving 60 pre-teens (average age 11 years old) with loss of control eating (defined as eating a large amount of food accompanied by a sense of loss of control over eating) versus 60 with normal eating patterns, Hartmann, Czaja, Rief, and Hilbert (2012) found that those with loss of control eating were more like to have a parent with depression.

In sum, as is evident through the studies presented above, parental depression has been associated with eating disordered behavior among adolescents and this relationship may be stronger for maternal relative to paternal depression (Arikian et al., 2007; Strober et al., 1982).

**Emotional Abuse**

A third parental factor that has been shown to have a detrimental effect on youth development is emotional abuse (EA). EA is characterized by verbal hostility, taunting, belittling, and rejection and is typically a persistent, chronic pattern, rather than an isolated incident (Egeland, 2009). Emotional abuse has been associated with a wide array of mental health problems among children and adolescents, including internalizing and
externalizing behaviors, social impairment, low self-esteem, suicidal behavior, as well as current and previous psychiatric diagnoses and hospitalizations (McGee, Wolfe, & Wilson., 1997; Mullen, Martin, Anderson, Romans, & Herbison, 1996; Vissing, Straus, Gelles, & Harrop, 1991). For example, Mullen at al., (1996) reported that a history of emotional abuse increases the likelihood of attempting suicide 12-fold. In a study by Shaffer, Yates, and Egeland (2009), teachers rated emotionally abused 6th graders as less likely to be accepted by peers and less emotionally healthy. Wekerle, Wolfe, Hawkins, Pittman., Glickman, & Lovald (2001) found that adolescents with a history of EA reported elevated PTSD symptoms and higher rates of dating violence. While most studies of childhood EA do not specify the perpetrator of abuse, parents are the most frequent perpetrators of EA. In 2005, research from the National Child Abuse and Neglect Data System (NCANDS), a voluntary data collection system that gathers information about reports of child abuse and neglect throughout the US, indicated that 79.4 percent of perpetrators of all forms abuse were parents.

Most of the research to date that has examined the association between childhood abuse and adolescent eating disordered behavior has focused on sexual abuse. Indeed, sexual abuse has been shown to be a reliable non-specific risk factor for eating disordered behavior (Thompson & Wonderlich, 2004; Smolak & Murnen, 2002). Physical abuse has also received some attention in this literature, and results suggest that there are higher rates of physical abuse histories in women with eating disorders, particularly bulimia (Folsom, Krahn, Nairn, Gold, Demitrack, & Silk, 1993; Rorty, Yager, & Rosotto, 1994). EA has received relatively less attention in the literature. This may be due fact that
emotional abuse is difficult to define and operationalize, is less detectable than other forms of abuse (i.e., sexual and physical), and the consequences were assumed to be less severe than sexual or physical abuse (Egeland, 2009).

In recent years researchers have begun to explore the role that EA during childhood may play in the etiology of disordered eating. Only one study has examined the effect of childhood EA on eating disordered behavior during adolescence. In a sample of adolescent psychiatric inpatients, Hopwood, Ansell, Fehon, and Grilo (2011) found that childhood EA was associated with eating disorder symptoms. Given the paucity of adolescent research in this area, studies involving adults (primarily young adults) will be reviewed below. Indeed, preliminary research suggests that the relationship between childhood EA and disordered eating remains significant into adulthood.

Higher rates of childhood EA have been reported among women with versus without bulimic spectrum disorders (bulimia, binge eating disorder, anorexia-binge/purge subtype) (Groleau, Steiger, Bruce, Israel, Sycz, Ouellette, & Badawi, 2012; Rorty et al., 1994). Additonally, Allison, Grilo, Masheb, & Stunkard (2007) found that adults diagnosed with binge eating disorder had higher rates of childhood EA than both overweight and obese individuals without binge eating disorder.

Some studies have found an association between childhood EA and severity of eating related symptoms and behavior among individuals with eating disorders. In a group of adults diagnosed with binge eating disorder, childhood EA was associated with greater levels of body dissatisfaction (Dunkley, Masheb, & Grilo, 2010). In a group of women with bulimic spectrum disorders, Groleau et al. (2012) found that childhood EA
was associated with higher overall severity of eating symptomology, increased dieting, and higher restraint around food. However, a few studies have not found a relationship between childhood EA and severity of eating pathology in adults with bulimia spectrum disorders (Hart & Waller, 2002) and adolescents and adults (age range 14-36) with eating disorders (anorexia, bulimia, and EDNOS) (Kong & Bernstein, 2009).

Research also supports a relationship between childhood EA and overall disordered eating attitudes and behaviors in non-clinical populations, including undergraduates (Burns, Fischer, Jackson, & Harding, 2012; Fischer, Stojek, & Hartzell, 2010; Kennedy, Ip, Samra, & Gorzalka, 2007) and adult women from the community (Kent, Waller, & Dagnan, 1999). Several studies also found this relationship when looking specifically at bulimic symptoms (Gerke, Mazzeo, & Kliwer, 2006; Hund & Espelage, 2006). In fact, research with non-clinical population suggests that EA may play a stronger role than childhood physical or sexual abuse in predicting disordered eating (Fischer et al., 2010; Kent et al., 1999).

**Summary of Parental Factors**

Overall, there is some research to suggest that lower parental monitoring and parental depression are associated with increased disordered eating in adolescents. Research in the area of EA has largely been conducted with adult populations who provided retrospective reports of childhood EA. However, results from the one study that examined the association between childhood EA and disordered eating in adolescents found a significant positive relationship. It is clear that additional studies are needed with adolescent populations.
Intra-individual Risk Factors for Disordered Eating

Emotional-Social Intelligence

Similar to the parental rearing environment, psychological, intra-individual factors may also play an important role in adolescent eating disordered behavior. Specifically, aspects of “emotional-social intelligence” (ESI), one measure of social and emotional competence, are potential predictors. ESI is a broad construct that is defined as a “cross-section of interrelated emotional and social competencies, skills and facilitators that determine how effectively we understand and express ourselves, understand others and relate with them, and cope with daily demands” (Bar-On & Parker, 2000). As per Bar-On and Parker (2000), it is comprised of four domains: 1) intrapersonal abilities (emotional self awareness and the ability to subsequently express these emotions to others); 2) interpersonal abilities (ability to understand others’ emotions and relate well to them); 3) stress management (ability to manage and control difficult emotions through affect regulation), and 4) adaptability (perceived ability to manage change, adapt, and solve problems). Ultimately, an individual who has these skills (i.e., has an adaptive level of ESI) and, hence is able to understand and manage emotions, will effectively be able to “manage personal, social, and environmental change by realistically and flexibly coping with the immediate situation, solving problems, and making decisions” (Bar-On, 2006).

Lower social and emotional competence, as conceptualized by Bar-On’s theory of ESI, has been associated with a range of internalizing and externalizing problems in adolescents. Specifically, research suggests that emotional-social intelligence has an inverse relationship to smoking cigarettes and drinking alcohol (Trinidad & Johnson, 2002), number of school discipline referrals (Peterson et al., 2009), depression (Reker &
Parker, 1999), mental health problems (as assessed by a composite measure of somatic symptom, anxiety, social dysfunction and depression) (Hassan, Shabani, Ahmad., & Baba, 2011), family problems, conduct problems, cognitive problems, anger control problems, hyperactivity (Bar-On & Parker, 2000), and neuroticism (Bar-On & Parker, 2000). Additionally, higher social emotional competence has been associated with academic success (Salami & Ogundokun, 2009), social skills (Falatooni., Maktabi, Honarmand, & Pour, 2012), and several adaptive dimensions of personality (extraversion, agreeableness, and conscientiousness) (Bar-On & Parker, 2000).

It stands to reason that individuals with poor social-emotional skills may develop maladaptive methods to cope with difficult emotions and problems. Disordered eating behavior itself has been conceptualized as a coping mechanism; in particular, as a way to escape or manage negative emotions (Heatherton & Baumeister, 1991). No studies of the relationship between overall ESI and disordered eating in adolescents have been published. However, support exists to suggest that poorer ESI, based on Bar-On’s conceptual model, is associated with disordered eating among female college students. In a study conducted by Costarelli, Demerzi, and Stamou (2009), college women who reported high levels of disordered eating compared to healthy controls, had lower levels of ESI. Additionally, in both groups of women, lower levels of ESI were associated with poorer body satisfaction. Similarly, Markey and Van Der Wall (2007) found that lower ESI was associated with higher levels of bulimic symptoms in undergraduate females. A number of studies have also examined Bar-On’s four domains of ESI (intrapersonal
abilities, interpersonal abilities, stress management, and adaptability) in relation to disordered eating, which are presented below.

**Intrapersonal abilities**

Several studies suggest a relationship exists between intrapersonal abilities (emotional self awareness and emotional expression), and disordered eating in adolescents. With regard to emotional awareness, adolescent girls from the community with high levels of disordered eating have been found to report poorer emotional awareness than those with low or no disordered eating (Sim & Zeman, 2006). Poor emotional awareness was also found to be positively associated with drive for thinness, even after taking into account the effects of body dissatisfaction (Sim & Zeman, 2006). Sim and Zeman (2004) compared three groups of adolescent females, those diagnosed with bulimia nervosa, those diagnosed with depression, and health controls from the community, in a case control study. They found that girls diagnosed with bulimia nervosa reported poorer emotional awareness and identification skills than both other groups.

Similar to emotional awareness, a number of studies have also found an association between emotional expression and adolescent eating disordered behavior. Sim and Zeman (2004) found that adolescent females with bulimia relative to healthy controls were more reluctant to express negative emotions. Similarly, Zaitsoff, Geller, and Srikameswaran (2002) found that female high school students with higher eating disorder symptoms reported less emotional expression, particularly anger, compared to those with lower eating disorder symptoms. In a sample of adolescent females from the community,
Buchholz, Henderson, Hounsell, Wagner, Norris, and Spettigue (2007) found that lower emotional expression was associated with eating disorder symptoms.

Another term used to represent emotional self-awareness and expression in the ESI literature is alexithymia. Alexithymia is characterized by “difficulty identifying and describing one’s emotions” (Sifneos, 1973). In a study conducted by Zonnevijlle-Bendek, Goozen, Cohen-Kettenis, and Van Elburg (2002), a group of adolescent females with eating disorders was compared to a healthy control group. Researchers found that those with an eating disorder scored significantly higher on a measure of alexithymia relative to healthy controls. In a community sample of older adolescents, Karukivi, Hautala, Korpelainen, Haapasalo-Pesu, Liukila, Joukamaa and Saarijärvi (2010) found that eating disorder symptoms were more common in adolescents who were identified as alexithymic relative to those without this characteristic.

**Interpersonal abilities**

Research in the area of interpersonal abilities (specifically, the ability to understand others’ emotions and relate well to them), suggests that adolescents with disordered eating have weaker interpersonal competence and more problems developing healthy relationships. In a sample of adolescent psychiatric inpatients, Zaitsoff, Fehon, and Grilo (2009) found that interpersonal deficits in peer relations were associated with eating psychopathology in both females and males, even after accounting for depression and low self-esteem. In a study conducted by Elliot, Tanofsky-Kraff, Shomaker, Columbo, Wolkoff, Ranzenhofer, and Yanovski (2010), social problems were found to be associated with binge eating in a sample of community children and adolescents (ages 8-
Interestingly, some evidence suggests that adolescents with eating disorders struggle to even recognize others’ emotions as evidenced by worse performance on a facial emotion recognition task (Zonnevijlle-Bendek et al., 2002). This would undoubtedly make it more difficult for them to understand their emotions and relate well to others.

**Stress management**

Research in the area of stress management (managing and regulating difficult emotions), suggests that difficulties regulating emotions are associated with disordered eating in adolescents. In a study conducted by McLaughlin, Hatzenbuehler, Mennin, and Nolen-Hoeksema (2011), emotion dysregulation was found to predict increases in eating pathology over the course of seven months in a community based sample of adolescents. Emotion dysregulation has also been associated with more eating disorder symptoms in cross-sectional research with a community based adolescent sample (Weinberg & Klonsky, 2009). In a study that compared adolescents and young adults (ages 15-25 years) diagnosed with an eating disorder to same aged healthy controls, Pierrehumbert, Bader, Miljkovitch, Mazet, Amar, and Halfon (2002) found that those with an eating disorder had poorer emotion regulation skills than healthy controls.

**Adaptability**

Various indicators of adaptability (the ability to manage change, adapt, and solve problems) have also been associated with disordered eating across numerous studies. Though no research has examined problem solving ability in this regard, research does suggest that adolescents with disordered eating (specifically, binge eating) use problem-
solving coping (i.e., strategies to directly remove or reduce the problem or situation causing distress) less frequently that those who do not report binge eating (Sierra-Baigre, Lemo-Giraldez, Paino, & Fonseca-Pedrero, 2012). Furthermore, in adult populations, several studies suggest that women with eating disorders report lower problem solving ability (Campanelli, Bove, & D’Annunzio, 1993; Etringer, Altmaier, & Bowers, 1989; Soukup, Beiler, & Terrell, 1990) than those without eating disorders.

**Summary of Intra-individual Factors**

While no studies of the relationship between overall ESI and disordered eating in adolescents have been published, some support exists to suggest that poorer ESI is associated with disordered eating among female college students. Several studies have examined individual domains of ESI (intrapersonal abilities, interpersonal abilities, stress management, and adaptability) in relation to disordered eating among adolescents. Results from this research suggest that deficits in intrapersonal abilities, interpersonal abilities, and stress management skills are associated with disordered eating in adolescents. No studies examining the relationship between adaptability and disordered eating in adolescents have been published; however, there is some research support for the relationship between disordered eating and problem-solving coping, a construct related to adaptability, in adolescents.

**Interaction of Parent-Related Environmental and Intra-individual Risk Factors**

As described above, research suggests a direct relationship between parent-related environmental risk factors (i.e., poor parental monitoring, parental depression, childhood emotional abuse) and disordered eating as well as between emotional-social intelligence.
and disordered eating in adolescents. It is also possible that ESI may moderate the association between the parent-related environmental risk factors and disordered eating. Adolescents with poor ESI lack the emotional and social competencies that enable them to understand and express themselves, understand others and relate to them, and cope with difficult emotions and daily stress. For these adolescents, the negative effects of growing up without adequate parental monitoring, with a depressed parent, or as a victim of emotional abuse may be compounded. Specifically, they may have a more difficult time coping with the distress associated with a maladaptive parenting environment and develop disordered eating behaviors as a maladaptive means to manage this distress. Indeed, according to escape theory, disordered eating behavior itself has been conceptualized as a coping mechanism; in particular, as a way to escape or manage negative emotions (Heatherton & Baumeister, 1991). In contrast, adolescents with relatively healthier ESI may be able to better manage a difficult parenting environment. Hence, the interaction between parenting environment and an adolescent’s ESI may predict disordered eating trajectories. To date, no published studies have examined how these environmental and intra-individual risk factors interact to influence disordered eating.

**Summary**

In summary, eating disorders are a significant public health concern. Both diagnosable and sub-clinical eating pathology are associated with high relapse rates, emotional distress, medical complications, and functional impairment (Moor et al., 2004; Schmidt et al., 2008). Additionally, eating disorders are frequently first diagnosed during adolescence (Streigel-Moore & Bulik, 2007) and are more prevalent among adolescent
females compared to males (Croll et al., 2002). Many studies that examine the development of eating pathology over time aggregate all data to identify one developmental pathway; however, multiple trajectories of adolescent eating pathology have been identified (Aime et al., 2008; Fay et al., 2013; Smith et al., 2007). Gender has been found to significantly influence these trajectories. In addition to socio-demographic factors, there are numerous environmental and intra-individual psychological factors that affect the degree to which an adolescent is at risk for developing disordered eating. Dysfunctional family environments and unhealthy parenting can play a role in the genesis and maintenance of disordered eating (Le Grange et al., 2010). In particular, there exists evidence to suggest that parental depression, poor parental monitoring (including child disclosure, parental control, parental solicitation, and parental knowledge), and emotional abuse are all associated with adolescent disordered eating attitudes and behavior. With regard to intra-individual psychological factors, an association has been found between ESI (intrapersonal abilities, interpersonal abilities, stress management, and adaptability) and disordered eating in adolescents. Not yet examined in this literature, though worthy of study, is whether ESI moderates the association between parental-related environmental risk factors and disordered eating. Adolescents with poor emotional and social competencies may have difficulty adaptively coping with the distress resulting from a maladaptive parenting environment. Consistent with escape theory (Heatherton & Baumeister, 1991), these adolescents may be at greater risk for developing disordered eating behaviors as a means to cope with this distress. It will be important for future research to comprehensively examine the association between parenting environment,
adolescent ESI, and their interaction in the prediction of adolescent disordered eating attitudes and behavior using longitudinal designs that account for both within and between person change and variability over time.
APPENDIX B

Null Results

Study Hypotheses
Based on the prior literature review (Appendix A), the following study hypotheses were offered:

1. Poor parental monitoring (i.e., child disclosure, parental solicitation, and/or parental control), parental depression, and childhood emotional abuse will predict maladaptive trajectories of eating attitudes and behaviors (i.e., increasing eating pathology, high and stable eating pathology). Moreover, these relationships will be stronger for females relative to males.

2. The associations between poor parental monitoring, parental depression, and childhood emotional abuse, and maladaptive eating trajectories, will be stronger among adolescents with poorer emotional-social intelligence (interpersonal skills, interpersonal skills, stress management, and adaptability) relative to those with stronger social-emotional intelligence.

Method

Participants
Participants included 87 adolescents, ages 13 through 18, and their parents (174 total individuals). These families participated in a pilot trial (6 dyads) or randomized clinical trial (81 dyads) that examined the efficacy of a suicide, substance abuse, and HIV prevention program for adolescents in mental health treatment (Project SHAPE). Families were randomized to a 12 hour prevention workshop plus a 2 hour individualized booster session or an assessment-only control condition. Adolescents across both arms were receiving community based mental health treatment at the time of recruitment.
Inclusion criteria for the study were as follows: adolescent enrollment in mental health treatment, parent and adolescent proficiency in English, and parent and adolescent residing in the same home. Exclusion criteria included a diagnosis of drug or alcohol dependence, current enrollment in a drug or alcohol treatment program, HIV infection, pregnancy, or adolescent cognitive level that would prohibit understanding of study material. The adolescent sample was primarily female (n = 53 females and 34 males) with a mean age of 15.5 (SD = 1.4). The sample was racially (46.5% Caucasian, 34.9% African-American, and 18.6% “Mixed race/Other”) and ethnically (82.8% non-Hispanic, 17.2% Hispanic) diverse.

**Procedure**

Participants were recruited via clinical referral from counselor or administrative staff at community mental health centers (27%), a youth shelter (43%), private mental health practices (10%), high school counselors (2%), or juvenile court staff (10%), as well as advertisements posted in local newspapers, on Craigslist, and university listserves (10%) (3% did not specify source of recruitment or referral). Parents and teens interested in participating in Project SHAPE provided their contact information to a counselor or administrative personnel at one of the recruitment facilities or contacted the research team directly based on information provided in study advertisements. The doctoral level project director or a graduate-level research assistant, screened parent and teen separately for eligibility via phone or in person and further explained the study. They were informed that the study would consist of four assessment time points, including a baseline and three follow-up assessments (one, six, and twelve months post-baseline). Those
randomized to the intervention condition received one and a half day group workshop (12 hours total) plus one booster session one month later (2 hours total) and those randomized to the assessment only control were provided with reading materials on substance use, HIV/STDs, and suicide. Parent and adolescent were also informed them that they would each receive between $25 and $75 at each of the four assessments. If eligibility criteria were met, an appointment was made for the baseline assessment, at which time, consent and adolescent assent was obtained. All measures used for the present study were completed via a computer questionnaire. This study used data obtained at baseline for the predictor variables (parental monitoring, parental depression, and child emotional abuse) and moderator variables (emotional-social intelligence). Baseline, six month follow-up, and twelve month follow-up data were used for outcome variable (disordered eating attitudes and behaviors). All study procedures were approved by the university affiliated institutional review board.

Measures

Demographic Variables. Demographics were assessed by participants’ self-reported gender, age, ethnicity, and race as part of the baseline assessment.

Parental Monitoring. The Parental Monitoring Questionnaire (PMQ; Stattin & Kerr, 2000) is a 24-item self and parent-report questionnaire that uses a 5-point Likert scale (‘no, never’ to ‘yes, always’) to assess degree of several aspects of parental monitoring. The three subscales used in the present study were Child Disclosure, Parental Solicitation, and Parental Control. Both the adolescent-report and parent-report versions were used. The Child Disclosure subscale (children’s free, willing provision of
information about who they are with, what they are doing, where they are) had acceptable internal consistency for parent-report (chronbach’s alpha = .76), but poor internal consistency for adolescent-report (chronbach’s alpha = .66) in this study. Hence, the adolescent version of this subscale was not used in analyses. The Parental Solicitation subscale (parents efforts to gather information about children’s activities by asking them, their friends and their friends’ parents) had high internal consistency for adolescent-report (chronbach’s alpha = .88) and acceptable internal consistency for parent-report (chronbach’s alpha = .72) in this study. Scores on the parent version of this subscale were not normally distributed (skew and kurtosis > 2) and could not be successfully transformed; hence, they were not used in analyses. The Parental Control subscale (parent’s control over children’s freedom to simply come and go as they please, without getting permission first or explaining afterward where they have been and what they have been doing) had acceptable internal consistency for adolescent-report (chronbach’s alpha = .77) and poor internal consistency for parent-report (chronbach’s alpha = .60) in this study. Hence, the parent version of this subscale was not used in analyses.

**Parental Depression.** The 6-item self-report depression subscale of the Brief Symptom Inventory (BSI; Derogotis, 1993) assesses depressive symptom severity over the last week using a 5-point Likert scale (‘not at all’ to ‘extremely’). This subscale had high internal consistency (chronbach’s alpha = .88) in the present study.

**Childhood Emotional Abuse.** The 5-item Emotional Abuse subscale of the Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1998) was used to assess emotional abuse. Items begin with the stem, “When I was growing up,” and are followed
by items that keep words such as “abuse” to a minimum. The items are rated on a 5-point scale (‘never true’ to ‘very often true’). This subscale had good internal consistency (chronbach’s alpha =.80) in the present study.

**Emotional Social Intelligence.** The BarOn Emotional Quotient Inventory: Short Youth Version (BarOn EQ-i:YV(S); Bar-On & Parker, 2000) was used to assess emotional social intelligence. This is a 30-item self-report instrument that employs a 4-point Likert scale (‘not true of me’ to ‘very much true of me’). It includes a total EI score as well as 4 subscales: intrapersonal skills (capacity for understanding and expressing feelings), interpersonal skills (capacity for understanding other’ feelings and relating with people), stress management skills (capacity for managing and controlling emotions), and adaptability (capacity for solving problems). Internal consistencies were good for all subscales and the full scale (chronbach’s alphas ranging from .79 to .87) in the present study. However, the interpersonal skills subscale was not normally distributed (kurtosis > 2) and could not be successfully transformed; hence, they were not used in analyses.

**Eating Disorder Attitudes and Behaviors.** The Eating Attitudes Test (EAT-26; Garner, Olmsted, Bohr, & Garfinkel, 1982) is a 26-item self report measure that assesses thoughts, feelings, and behaviors associated with eating disorders. Each item is rated on a 6-point Likert scale (‘never’ to ‘always’). The measure yields 3 subscales (Dieting, Bulimia and Food Preoccupation, Oral Control) and a total score. Internal consistencies were good at all time points for the total score (chronbach’s alphas ranging from .83 to .89).
Data Analysis Plan
In preliminary analyses, bivariate relationships between disordered eating attitudes and behaviors (measured at baseline, 6-month follow up, and 12-month follow up), predictor variables at baseline (aspects of parental monitoring, child emotional abuse, and parental depression), moderator variables at baseline (domains of emotional-social intelligence), and potential covariates (demographic variables, intervention condition, hours seen in mental health treatment over the 12 month study period) were examined via correlations and t-tests.

Individual Growth Curve (IGC) analyses were used to investigate within-person systematic change and between-person differences in the development of disordered eating attitudes and behaviors over time. IGC analyses allowed us to examine variation in the growth parameters (i.e., intercept and slope) for each participant’s EAT trajectory. Our IGC analyses were conducted using linear mixed models in SPSS Statistics 22. This method of analysis represents a powerful way to assess change in a continuous dimension overtime within subjects (Rogosa, Brandt, & Zimowski, 1982; Rogosa & Willett, 1985) and has several advantages over more conventional statistical techniques that examine change over time (e.g., generalized linear models, analysis of variance, and analysis of covariance) (Shek & Ma, 2011). IGC analyses do not require balanced data across different waves of data, resulting in a more flexible approach when handling unequal sample size, inconsistent time interval, and/or missing data (Shek & Ma, 2011). Additionally, they are more powerful, as they model the true covariance structure as opposed to imposing a different structure on the data (Shek & Ma, 2011).
The process of using IGC analyses entails specifying different sets of models in order to examine change in the predictive effect when additional variables are added. First, we examined the unconditional means model in which no predictors were included in order to partition the variance within-person and the variance between-person in EAT scores separately. Second, we examined the unconditional linear growth model by adding time-point as the only predictor in order to examine individuals’ EAT trajectories over time. Such unconditional analyses are useful for describing the net variation in slope and intercept across individuals. Before adding the predictor of interest (aspect of parental monitoring, childhood emotional abuse, or parental depression) to the linear growth model, a series of three conditional linear growth models were created to examine the influence of three potential covariates on EAT trajectories, including gender, intervention condition, and hours spent in community based mental health treatment. These variables were selected as covariates given that gender differences in eating behavior have been found in prior research and material presented in the context of the study intervention and outpatient mental health treatment could influence parental monitoring behavior.

Then, for each predictor variable, we conducted a conditional linear growth model in which we examined systematic between-person differences in growth parameters of EAT trajectories as a function of that predictor variable. Significant predictor-by-time interactions were probed for simple slopes (Preacher, Curran, & Bauer, 2006) by running the unconditional linear growth model among participants low in the predictor variable (-1 SD) and high in the predictor variable (+1 SD) to further understand the direction of the relationship between the predictor and disordered eating trajectory. To explore effects of
gender, each of the conditional linear growth models was examined among females only. Given that the sample only included a small number of males (n=34), and the males had a very restricted range on the EAT scale (0-17) compared to the females (0-50), the growth models were not examined among males alone.

Lastly, to examine if emotional social intelligence acts as a moderator for the relationship between the parental environment variables and disordered eating, an interaction model was run for each of the parental environment predictors. For each of these models, three predictors of the individual growth trajectory parameters were entered in the model, specifically, the parental environment variable, emotional social intelligence variable, and the interaction between parental environment and emotional social intelligence variables. In addition to overall emotional social intelligence (as assessed by overall EQi score), specific domains of ESI (as assessed by EQi subscales) were examined independently as moderators.

Results

Descriptive Statistics
Descriptive statistics for measures of parental monitoring, childhood emotional abuse, parental depression, emotional-social intelligence, and disordered eating attitudes and behaviors are presented in Table 8.
Preliminary Bivariate Analyses

As scores on some several variables were positively skewed (> 2), transformations were conducted to decrease the skew to < 1. A log transformation was used on the EAT scale and the BSI-Depression scale. All analyses were conducted with the transformed versions of these variables. As noted in the Methods section, parent-report of the parent solicitation subscale on the PMQ and interpersonal skills subscale of the ESI were not normally distributed. Attempts to transform variables did not yield a normal distribution and, hence, these subscales were not used in analyses. All other variables were normally distributed.

Bivariate relationships between disordered eating attitudes and behaviors (measured at baseline, 6-month follow up, and 12-month follow up), predictor variables at baseline (aspects of parental monitoring, child emotional abuse, and parental depression), moderator variables at baseline (emotional-social intelligence variables), and potential covariates (demographic variables, intervention condition, hours seen in mental
health treatment over the 12 month study period) were examined via correlations and t-tests. Correlation coefficients are presented in Table 8. Among predictor variables, childhood emotional abuse was significantly and positively correlated with eating disorder symptoms at 6-month and 12-month follow-up. Additionally, higher levels of parental control were correlated with higher levels of eating disorder symptoms at 6-month follow-up. Among moderator variables, lower intrapersonal skills were correlated with greater levels of eating disorder symptoms at baseline. Additionally, lower stress management skills were significantly correlated with greater levels of eating disorder symptoms at baseline and 6-month follow-up. Among demographics variables, female gender was significantly correlated with eating disorder attitudes and behaviors at baseline and 6-month follow up, such that females reported higher levels of eating disorder symptoms than males. No other significant correlations were found.

**Individual Growth Curve Analyses**

In the first model, the unconditional means model, no predictors were included in order to partition the variance within-person and the variance between-person separately (see Table 9). The Intraclass Correlation (ICC) was approximately .492, which indicates that 49.2% of the variance in EAT scores was due to between-person differences and 50.8% was due to within-person differences. This means that slightly under half of the variation in the entire sample EAT scores was due to differences between participants. In the second model, the unconditional linear growth model, time was added as a predictor to examine individuals’ EAT trajectories over time (see Table 9). Time was not a significant predictor, indicating that there was not a significant change in the mean EAT
score over the course of one year. However, time did account for 20.5% of within-person variance in EAT scores.

Table 9: EAT Individual Growth Curve Analyses

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unconditional Means Model</th>
<th>Unconditional Linear Growth Model</th>
<th>Linear Growth Model with Controls</th>
</tr>
</thead>
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<td>SE</td>
<td>p-value</td>
</tr>
<tr>
<td>Intercept</td>
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</tr>
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<td>.56</td>
</tr>
<tr>
<td>Gender</td>
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<td>.07</td>
<td>.01*</td>
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<tr>
<td>Condition x Time</td>
<td>-.21</td>
<td>.04</td>
<td>.23</td>
</tr>
</tbody>
</table>

Next, three conditional linear growth models examined the influence of potential covariates (gender, intervention condition, and hours spent in community based mental health treatment) on EAT trajectories. Gender was significant in predicting between-person intercept variance, but not slope variance, in EAT trajectories, meaning that gender predicted baseline EAT scores but did not predict the rate of change in EAT over the year. Specifically, females reported greater disordered eating attitudes and behaviors at baseline ($\beta = .21, p < .05$). Intervention condition trended toward significantly predicting slope variance, but not intercept variance, such that individuals in the prevention workshop group showed a faster rate of change in EAT score over the course of one year than the assessment only group ($\beta = .05, p = .06$), but there was no significant difference in baseline EAT score between the two groups. Hours spent in community based mental health treatment did not significantly predict variance in intercept or slope of EAT trajectories. To control for gender and intervention condition in all IGC analyses,
the base linear growth model to which predictors of interest were added included gender and intervention condition (Table 9).

**Parental Monitoring – Child Disclosure**

Given the poor internal consistency of the adolescent-report Child Disclosure subscale (as noted in the Methods section), only parent-report of Child Disclosure was used in analyses. According to results of the linear growth model including Child Disclosure as a predictor of EAT trajectories, Child Disclosure did not significantly predict between-person variance in slope ($\beta = -.00, p = .81$) in the full sample or among just females ($\beta = -.00, p = .73$).

None of the linear growth models examining domains of emotional social intelligence or the full scale as potential moderators of the relationship between Child Disclosure and EAT trajectories were significant.

**Parental Monitoring – Parent Solicitation**

Given that the scores on the parent-report Parent Solicitation subscale were not normally distributed (as noted in the Methods section), only adolescent-report of Parent Solicitation was used in analyses. According to results of the linear growth model including Parent Solicitation as a predictor of EAT trajectories, Parent Solicitation did not significantly predict between-person variance in slope ($\beta = .00, p = .65$) in the full sample or among just females ($\beta = .00, p = .75$).

None of the linear growth models examining domains of emotional social intelligence or the full scale as potential moderators of the relationship between Parent Solicitation and EAT trajectories were significant.
**Parental Monitoring – Parental Control**

Given the poor internal consistency of the parent-report Parental Control subscale (as noted in the Methods section), only adolescent-report of Parental Control was used in analyses. According to results of the linear growth model including Parental Control as a predictor of EAT trajectories, Parental Control did not significantly predict between-person variance in slope ($\beta = -.00, p = .73$) in the full sample or among just females ($\beta = -.01, p = .49$).

None of the linear growth models examining domains of emotional social intelligence or the full scale as potential moderators of the relationship between Parental Control and EAT trajectories were significant.

**Parental Monitoring – Parental Monitoring (a.k.a. Parental Knowledge)**

According to results of the linear growth model including parent report of Parental Knowledge as a predictor of EAT trajectories, Parental Knowledge did not significantly predict between-person variance in slope ($\beta = -.00, p = .48$) in the full sample or among just females ($\beta = -.01, p = .18$). None of the linear growth models examining domains of emotional social intelligence or the full scale as potential moderators of the relationship between parent report of Parental Knowledge and EAT trajectories were significant.

According to results of the linear growth model including adolescent report of Parental Knowledge as a predictor of EAT trajectories, there was a trend towards Parental Knowledge predicting between-person variance in slope ($\beta = -.01, p = .07$) in the full sample as well as among just females ($\beta = -.01, p = .07$). Specifically, results suggest a trend towards a change in disordered eating attitudes and behaviors in a maladaptive
direction (i.e., less decrease or greater increase in disordered eating) among adolescents who reported lower levels of parental monitoring. None of the linear growth models examining domains of emotional social intelligence or the full scale as potential moderators of the relationship between adolescent report of Parental Knowledge and EAT trajectories were significant.

12-Month Change Scores in Domains of Parental Monitoring

The linear growth models examining twelve-month change in domains of Parental Monitoring as predictors of EAT trajectories yielded null results for all of the domains of Parental Monitoring. Change in parent report of Child Disclosure did not significantly predict between-person variance in slope ($\beta = -.01, p = .16$) in the full sample or among just females ($\beta = -.01, p = .22$). Change in adolescent report of Parent Solicitation did not significantly predict between-person variance in slope ($\beta = -.01, p = .18$) in the full sample or among just females ($\beta = -.00, p = .41$). Change in adolescent report of Parent Control did not significantly predict between-person variance in slope ($\beta = -.00, p = .20$) in the full sample or among just females ($\beta = -.01, p = .16$). Change in parent report of Parental Knowledge did not significantly predict between-person variance in slope ($\beta = -.01, p = .16$) in the full sample or among just females ($\beta = -.01, p = .14$). Change in adolescent report of Parental Knowledge did not significantly predict between-person variance in slope ($\beta = -.00, p = .62$) in the full sample or among just females ($\beta = -.00, p = .41$). None of the linear growth models examining domains of emotional social intelligence or the full scale as potential moderators of the relationship between twelve-month change in domains of Parental Monitoring and EAT trajectories were significant.
**Parental Depression**
According to results of the linear growth model including Parental Depression as a predictor of EAT trajectories, Parental Depression did not significantly predict between-person variance in slope ($\beta = .08, p = .66$) in the full sample or among just females ($\beta = .13, p = .63$).

None of the linear growth models examining domains of emotional social intelligence or the full scale as potential moderators of the relationship between Parental Depression and EAT trajectories were significant.

**Childhood Emotional Abuse**
According to results of the linear growth model including Childhood Emotional Abuse as a predictor of EAT trajectories, Childhood Emotional Abuse did not significantly predict between-person variance in slope ($\beta = .00, p = .83$) in the full sample or among just females ($\beta = .00, p = .52$).

None of the linear growth models examining domains of emotional social intelligence or the full scale as potential moderators of the relationship between Childhood Emotional Abuse and EAT trajectories were significant.

**Discussion**
The null results from this study may, in part, be due to the relatively low levels of eating pathology in the sample. The level of eating disorder attitudes and behaviors was somewhat lower in the present study relative to previously reported adolescent norms, which in turn reduced range and variability of scores. The mean EAT scores in our sample were 4.6, 3.4, and 3.9 for males, and 7.4, 8.6, and 8.2 for females, across the three
time points. In contrast, a study of over 1,300 high school students found a mean of 5.2 for males and 11.9 for females on the EAT (Rosen, Silberg, & Gross, 1988). Levels of disordered eating attitudes and behaviors may have been lower in our sample because parents who enrolled their adolescents in our study were most concerned about adolescent substance use, suicidality, and risky sexual behavior (the focus of the intervention study from which our data was collected) rather than disordered eating. Additionally, all participants were already in mental health treatment; hence, they may have already been getting help for emotional concerns which may have decreased the likelihood of developing eating pathology.

The null results from may also be due, in part, to the relatively small sample size used in this study and resulting low power to detect effects. Although there are few strict requirements for the types of data that might be analyzed using growth models, and IGC analysis is a more flexible and powerful method for capturing developmental change than many traditional approaches (e.g., generalized linear models, analysis of variance, and analysis of covariance) (Shek & Ma, 2011), sample sizes approaching 100 are preferred (Curran, Obeidat, & Losardo, 2010). There was some evidence for a relationship between a number of the predictors of interest and eating pathology in bivariate correlations, but none significant predicted trajectory of EAT scores in IGC analyses.
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