The Parent-Child Relationship: A Potential Source of Resilience for Children and Youth Struggling with an Eating Disorder

Final Outcomes Report

Micayla Ahearn
McMaster University

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Executive Summary

Attachment theorists have long identified that a family environment unable to provide a sense of security, availability, and attention to the child’s needs, contributes to a dependency and/or detachment that characterizes a number of mental disorders, including eating disorders. It has also been established that the implications of attachment among youth populations may lead to affect dysregulation, a factor that has also associated with eating disorders. In fact, disordered eating is considered by some researchers to be a form of coping with internalized distress. Given that attachment has been associated with affect regulation, and that affect regulation has been associated with disordered eating, it is reasonable to predict that attachment will predict disordered eating, but that this relationship will be mediated by affect regulation. This prediction is consistent with a view held by several authors, which considers eating disorder symptoms to be direct expressions of the psychological and emotional processes constituting these attachment patterns. The present study uses regression analysis to test the proposed mediation model.

The purpose of the present study is to explore the relationships among attachment, affect regulation, and eating disorder symptoms in an adolescent patient population. The objective of this analysis is to better understand the underlying mechanisms involved in the development of eating disorders, and to apply these findings to improve treatment approaches among children and youth. Currently, the predicted mediation model involving attachment style, affect regulation and eating disorders has not yet been tested in a pediatric population.

The results of the present study are inconsistent with both adult and adolescent literature on attachment and eating disorders. The present study found that attachment was not consistently linked with eating disorder symptoms, and when there was an association, it was not mediated by affect regulation. Thus, the proposed hypothesis was not confirmed with this pediatric clinical population. Through further review of the literature, with specific attention being given to particular parental behaviours possible explanations were found. However, consistent with previous research, affect regulation was correlated with eating pathology. These findings indicate the need for future research and a more comprehensive theory on the manner in which parenting can influence the severity of child and youth mental health.
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Introduction

Attachment theory, according to Bowlby (1969, 1973, 1980), is the process of creating “internal working models” regarding the concept of self, others, and the external environment (Latzer, Hochdorf, Bachar & Canetti, 2002). The views of self and others contribute to concepts of interpersonal interaction, for example, a generalized trust in others and a readiness to share and express feelings (Bowlby, 1969, 1973, 1980). The child’s ‘attachment model’ is described by Dallos (2003) as shaped by early experiences that are internally represented as emotionally toned beliefs and expectations about relationships. Bowlby (1980) argued that over time, these models become stable patterns of thinking and behaving because the models guide the way in which information is processed. The quality of early attachment relationships is rooted in the degree to which an infant has come to rely on the attachment figure as a source of security (Ainsworth, Blehar, Walters & Wall, 1978).

The internalization of this early experience is expected to form a prototype for later relationships (Bowlby, 1973). Bowlby’s two-dimensional (positive or negative) models of the self and of the other were combined by Bartholomew & Horowitz (1991) to describe four prototypic forms of attachment: secure, preoccupied, dismissing and fearful. These four attachment styles are characterized by the associated positive or negative beliefs about the self and others. More specifically, as described by Zachrisson & Skarderud (2010), individuals with a secure attachment style are described as having experienced attachment figures as available and develop a positive view of themselves and of others. Conversely, individuals with a fearful attachment style are described as having experienced attachment figures being unpredictable or inconsistent, and develop negative views of both themselves and of others. Individuals with a preoccupied attachment style are described as having experienced attachment figures as unavailable and unpredictable, and come to hold negative views of both themselves and of others. Finally, individuals with a dismissing attachment style are described as having experienced attachment figures as rejecting and unavailable, and come to develop a negative view of others, while maintaining a positive view of themselves.

When considering the implications of attachment among youth populations, it is known that parental attachment plays a significant role in the development of affect regulation (Mikulincer, Shaver & Pereg, 2003). As described by Cole, Michel and Teti (1994) affect regulation is defined in the present study as “the ability to respond to the ongoing demands of experience with a range of emotions in a manner that is socially tolerable and sufficiently flexible…” In order to regulate one’s affect, one must be able to implement coping strategies effectively.

When considering the effect of parental attachment on the development of affect regulation, three main models of the way in which parental attachment relationships are represented have been proposed (Liu, 2008): (1) the hierarchy model, (2) the integrative model and (3) the independent model. The three models can be summarized as the following: The hierarchy model proposes that the organization of attachment relationships of multiple caregivers will be concordant with maternal attachments, and that the attachment to the mother will dominate the child’s developmental outcomes (Liu, 2008). The integrative model implies an organizational structure in which the child integrates all of his/her attachment relationships into a single representation, first
suggested by van IJzendoorn et al (1992). In this model, all attachment relationships are considered to be equal and independent. Finally, the independent model describes a system in which each attachment representation is considered as independent, both in quality and in its influence on development (Liu, 2008). This model claims that attachment to fathers and mothers may differentially predict the child’s relationship and adjustment.

Liu (2008) performed a study to determine which model best described the relationship between attachment to mothers versus fathers and its developmental consequences in an adolescent population. The consequences measured included adolescents’ social support from family and friends, social expectations in peer interaction, self-worth, and depressive symptoms. Although earlier studies have provided support for the hierarchy (Main et al 1985) and integrative models (van IJzendoorn et al 1992), the results from Liu (2008) indicate that the independent model best describes adolescents’ attachment relationships with parents and their subsequent developmental consequences, including affect regulation.

In addition to attachment relationships, poor affect regulation and particular coping strategies have also been associated with disordered eating (Bekker & Spoor, 2008). In fact, disordered eating is considered by some researchers as a form of coping with internalized distress (Blodgett Salafia, Gondoli, Corning, McEnery & Grundy, 2007). In support of this view, behaviours specific to Anorexia and Bulimia have often been associated with (releasing) negative affect, and viewed as a form of avoidant coping (Bekker & Spoor, 2008). Additional evidence is provided by Gilboa-Schechtman & colleagues (2006), who found that women with eating disorders exhibit lower emotional awareness and more deficient emotional regulation than normal controls. Further research has found different affect regulation strategies to differentially relate to specific eating disorder symptom presentations. In particular, high constraint, persistence and low novelty seeking has been associated with restriction and Anorexia, while impulsivity, sensation seeking, and novelty seeking has been predominantly associated with the bulimic pattern and Bulimia (Sohlb erg, 1991; Cassin & Ranson, 2005).

Given that attachment has been associated with affect regulation, and that affect regulation has been associated with disordered eating, it is reasonable to predict that attachment will predict disordered eating, but that this relationship will be mediated by affect regulation. This prediction is consistent with a view held by several authors (Candelori & Ciocca, 1998; Cole-Detke & Kobak, 1996; Ringer & Crittenden, 2007; Zachrisson & Kulbatten, 2006), which considers eating disorder symptoms to be direct expressions of the psychological and emotional processes constituting these attachment patterns. In support of this theory, attachment theorists have identified that a family environment unable to provide a sense of security, availability, and attention to the child’s needs, does contribute to a dependency and/or detachment that characterizes a number of mental disorders (Bowlby, 1988), including eating disorders (Bachar, 1998) (as in Latzer, Hochdorf, Bachar and Canetti, 2002).

Support for the prediction of a mediation relationship has been found in the literature related to parenting, a variable that contributes to the development of attachment. In a meta-analytic review of risk and maintenance factors for eating pathology, Stice (2002) summarized existing literature regarding parenting. Stice found that parenting predicted eating problems, and she proposed that the relationship was mediated by internalized
distress such as anxiety and depression. Blodgett Salafia and colleagues (2007) conducted a study that found support for Stice’s prediction. In particular, they found that parenting practices predicted maladaptive eating, and that this relationship was mediated by anxiety and depressive symptoms. Further support for this theory comes from findings indicating that attachment related factors (such as insecure attachment, fear of abandonment and lack of autonomy) differentiated those with eating disorders from those without (Ward, Ramsay & Treasure, 2000). Currently, the predicted mediation model involving attachment style, affect regulation and eating disorders has not yet been tested in a pediatric population.

The Present Study

The present study tested for a potential meditational relationship between attachment style, affect regulation and eating disorders in a pediatric population. This model considers the prediction that parent-child attachment itself will relate to eating disorders, and that affect regulation will mediate this relationship. Although past research has found relationships between these three variables, the majority of studies have focused on two variables at a time. The present study will attempt to combine all three variables into one comprehensive model, allowing for the examination of the interactions between the variables within a larger framework. Furthermore, the present study will examine the potential differences in effect of parental attachments by collecting measures of attachment for the adolescents’ general attachment style, in addition to the attachment relationships with both their mother and father independently.

The objective of the proposed study is to better understand factors that contribute to the development and maintenance of eating disorders among children and adolescents. Specifically, the present study will first consider whether youths’ relationships with their parents (attachment style) contribute to the strategies they use to cope with distressing emotions (affect regulation strategies). The present study will then consider whether the strategies youth use to cope with distressing emotions contribute to which eating disorder symptoms they present with (e.g. dietary restriction vs. binge eating and purging) and the severity of these symptoms.

Methods

Participants

Children and youth up to the age of 18 diagnosed with an eating disorder (e.g. Anorexia Nervosa, Bulimia Nervosa, Eating Disorder Not Otherwise Specified) and seen by the Pediatric Eating Disorders (PEDS) Program at McMaster Children’s Hospital in Hamilton, Ontario, were asked to participate in this study. The PEDS program provides services to children and adolescents up to the age of 18 who require multi-disciplinary assessment and treatment for an eating disorder. Services at the PEDS program include medical management, assessment, consultation, family therapy, individual therapy, group therapy, and nutritional counseling. Team members include pediatricians, psychologists, a psychiatrist, social workers, and a registered dietician.

In total, the study group comprised of 58 children and adolescents. However, as not all participants completed all measures, the sample size will vary depending on the
analysis conducted. Participants who did not complete all measures were not excluded from the study, as doing so would result in an unnecessarily reduced sample size.

**Procedure**

Patients treated by the PEDS Program at McMaster Children’s Hospital were asked to complete a series of self-report questionnaires related to attachment style, affect regulation strategies, and eating disorder symptom presentation and severity. All packages were completed at their time of intake into the PEDS Program. From these questionnaires, relevant data was extracted and analyzed as aggregated data. Statistical analyses were completed in order to test the hypothesis of this study.

**Measures**

Attachment style was measured using the Adolescent Relationship Scales Questionnaire (A-RSQ), the Adolescent Relationship Scales Questionnaire Mom (A-RSQ-M) and Adolescent Relationship Scales Questionnaire Dad (A-RSQ-D). All three of these scales are revisions of the original Relationships Scales Questionnaire (RSQ) (Griffith & Bartholomew 1994). Each of the A-RSQ measures is comprised of 17 statements related to attachment feelings and behaviours to which the youth is asked to indicate the extent to which the statements are characteristic of their close relationships. The statements in the A-RSQ refer to the adolescents’ general attachment style, while the statements in the A-RSQ-M and A-RSQ-D are directed specifically at the attachment relationship with the specified parent. The three variations of the RSQ were necessary to examine the potential differences and/or similarities in parental attachment on the development of affect regulation in an adolescent population. Given that Liu (2008) determined the independent model best described adolescents’ attachment relationships with parents and their subsequent developmental consequences, it is reasonable to predict differences in the correlations between the A-RSQ-M and A-RSQ-D, with the different measures of affect regulation.

The A-RSQ measures all yield scores on two dimensions, specifically the view of Self and Other. Both subscales produce scores in both the positive and negative direction. For example, a high score on the self-subscale would indicate a positive self-view, whereas a low score would be indicative of a negative or poor self-view.

Eating disorder symptom presentation and severity was measured using the EDI-3. The EDI-3 is a 91-item questionnaire assessing behavioral and psychological traits common in Anorexia and Bulimia. A review on the EDI-3 (Cullamen, 2006) reports that multiple factor analyses reveal reasonable support for EDI–3 scale compositions. The subscales used will be Drive for Thinness (DT), Bulimia (B) and Body Dissatisfaction (BD) subscales of the EDI. Specifically, the DT subscale is indicative of restrictive symptoms (highly associated with anorexia), the B subscale is indicative of bulimic symptoms (highly associated with bulimia), and the BD subscale is associated with both types of eating disorders. Data shall be analyzed using regression analyses to test the meditational model.

Affect-regulation was measured using both the Eating Disorders Inventory-3 (EDI-3) and Difficulties in Emotion Regulation Scale (DERS). The two subscales used from the EDI-3 to measure affect regulation in the present study were Affect Regulation (AR) and Impulse Control (IC).
The DERS is a 36-item questionnaire that was developed to assess emotion dysregulation, using items that reflect difficulties within the five specific dimensions of emotion regulation: (1) Awareness and understanding of emotions, (2) acceptance of emotions, (3) ability to control impulsive behaviours and behave in accordance with desired goals when experiencing negative emotions, (4) ability to use situationally appropriate emotion regulation strategies flexibly to modulate emotional responses as desired in order to meet individual goals and situational demands (5) ability to access emotion regulation strategies perceived as effective (Gratz & Roemer, 2004). The multidimensional assessment completed by Gratz and Roemer (2004) confirmed that the DERS has high internal consistency, good test-retest reliability, and adequate construct and predictive validity. The subscales used in the present study were Awareness (of emotions) (A) and Impulsivity (I).

**Statistical Methods**

All statistical analyses were completed using SPSS for Windows version 14.0. Descriptive data was produced to determine the prevalence of clinically significant scores in relevant psychometrics among the patients seen by the Pediatric Eating Disorders Program. Descriptive statistics were examined for all variables considered. All variables were analyzed to determine if data was normally distributed (Behrens, 1997). Pearson Product-Moment Correlations were used to examine the hypothesized relationships among variables. This involved the examination of three different correlation models; Attachment measure and eating disorder symptoms, attachment measure and affect regulation, and affect regulation and eating disorder symptoms. After these relationships were confirmed, the proposed mediator, affect regulation, was examined using stepwise multiple regressions for each of the proposed models.

As proposed by Baron and Kenny (1986), four criteria need to be met in order for affect regulation to be a mediator of attachment style and eating disorder symptom presentation: (1) attachment should be significantly associated with affect dysregulation; (2) attachment should be significantly associated with eating disorder symptoms; (3) affect dysregulation should be significantly associated with eating disorder symptoms; and (4) controlling for affect dysregulation, the association between attachment and eating disorders should be reduced or be no longer significant. Of note, multiple mediator variables (measures of affect regulation) were tested in the regression analysis. The Sobel test (1982) was used to determine whether the reduction in the association between attachment style and eating disorder symptoms was significant. The above criteria (Baron and Kenny, 1986) and the Sobel test (1982) are considered a valid and reliable method of testing for mediation.
Results

Demographics
A total of 58 female patients seen by the PEDS program completed the current study. However, as not all participants completed all measures, the sample size will vary depending on the analysis conducted. Participants who did not complete all measures were not excluded from the study, as doing so would result in an unnecessarily reduced sample size. The average age of the patients who participated in this study was 14.7 (range 11-18). The patient sample was largely Caucasian.

Descriptive Statistics
Descriptive analyses yielded means and standard deviations for the main variables: general attachment self-schema (A-RSQ Self), general attachment other-schema (A-RSQ Other), maternal attachment self-schema (A-RSQM Self), maternal attachment other-schema (A-RSQM Other), paternal attachment self-schema (A-RSQD Self), paternal attachment other-schema (A-RSQD Other), impulse control (EDI-IC), affect regulation (EDI-AR), impulsivity (DERS-I), awareness (DERS-A), drive for thinness (EDI-DT), bulimic symptoms (EDI-B) and body dissatisfaction (EDI-B).

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARSQ Self</td>
<td>58</td>
<td>-12.00</td>
<td>25.00</td>
<td>7.2069</td>
<td>8.28179</td>
</tr>
<tr>
<td>ARSQ Other</td>
<td>58</td>
<td>-24.00</td>
<td>20.00</td>
<td>-0.6897</td>
<td>9.64130</td>
</tr>
<tr>
<td>ARSQM Self</td>
<td>58</td>
<td>-10.00</td>
<td>30.00</td>
<td>11.6034</td>
<td>6.46160</td>
</tr>
<tr>
<td>ARSQM Other</td>
<td>58</td>
<td>-24.00</td>
<td>26.00</td>
<td>9.2759</td>
<td>12.08420</td>
</tr>
<tr>
<td>ARSQD Self</td>
<td>58</td>
<td>-28.00</td>
<td>26.00</td>
<td>1.9828</td>
<td>15.14664</td>
</tr>
<tr>
<td>ARSQD Other</td>
<td>58</td>
<td>-7.00</td>
<td>23.00</td>
<td>10.7414</td>
<td>6.96498</td>
</tr>
<tr>
<td>EDI-Impulse Regulation</td>
<td>58</td>
<td>0</td>
<td>26</td>
<td>10.16</td>
<td>6.429</td>
</tr>
<tr>
<td>EDI-Affect Regulation</td>
<td>58</td>
<td>0</td>
<td>24</td>
<td>10.10</td>
<td>6.717</td>
</tr>
<tr>
<td>DERS Nonacceptance of Affect</td>
<td>16</td>
<td>12.00</td>
<td>21.00</td>
<td>17.7500</td>
<td>2.76887</td>
</tr>
<tr>
<td>DERS Goal Oriented</td>
<td>16</td>
<td>9.00</td>
<td>21.00</td>
<td>16.0625</td>
<td>3.15106</td>
</tr>
<tr>
<td>DERS Impulse</td>
<td>16</td>
<td>7.00</td>
<td>26.00</td>
<td>15.5000</td>
<td>5.57375</td>
</tr>
<tr>
<td>DERS Awareness</td>
<td>16</td>
<td>11.00</td>
<td>19.00</td>
<td>15.4375</td>
<td>2.44864</td>
</tr>
<tr>
<td>DERS Strategies</td>
<td>16</td>
<td>19.00</td>
<td>32.00</td>
<td>25.1875</td>
<td>4.21456</td>
</tr>
<tr>
<td>EDI-Drive for Thinness</td>
<td>58</td>
<td>0</td>
<td>28</td>
<td>15.60</td>
<td>10.099</td>
</tr>
<tr>
<td>EDI-Bulimic Symptoms</td>
<td>58</td>
<td>0</td>
<td>30</td>
<td>8.88</td>
<td>9.073</td>
</tr>
<tr>
<td>EDI-Body Dissatisfaction</td>
<td>58</td>
<td>0</td>
<td>40</td>
<td>23.60</td>
<td>12.550</td>
</tr>
</tbody>
</table>

Note. Reduced sample size: DERS measures were completed by 16 of the 58 patients
Main Effects

Pearson’s Product Moment correlations were conducted in order to verify whether the variables of interest were related.

1. Attachment and Eating Disorder Symptoms

Table 2a: Pearson Product Moment Correlations

<table>
<thead>
<tr>
<th></th>
<th>-EDI-Drive for Thinness</th>
<th>-EDI-Bulimic Symptoms</th>
<th>-EDI-Body Dissatisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARSQ Self</td>
<td>-.024</td>
<td>.032</td>
<td>.008</td>
</tr>
<tr>
<td>ARSQ Other</td>
<td>.153</td>
<td>.013</td>
<td>.254</td>
</tr>
<tr>
<td>ARSQM Self</td>
<td>-.154</td>
<td>-.063</td>
<td>-.265(*)</td>
</tr>
<tr>
<td>ARSQM Other</td>
<td>-.255</td>
<td>-.199</td>
<td>-.444(**)</td>
</tr>
<tr>
<td>ARSQD Self</td>
<td>-.144</td>
<td>-.169</td>
<td>-.305(*)</td>
</tr>
<tr>
<td>ARSQD Other</td>
<td>-.138</td>
<td>.046</td>
<td>-.192</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed)
** Correlation is significant at the 0.01 level (2-tailed).

Table 2a indicates that both the maternal attachment self-schema and maternal attachment other-schema were negatively correlated with body dissatisfaction, but held no significant correlation with drive for thinness or bulimic symptoms. Similarly, the paternal attachment self-schema was negatively correlated with body dissatisfaction, but had no significant correlation with drive for thinness or bulimia subscales.

Surprisingly, neither the general attachment self-schema nor the general attachment other-schema was significantly correlated with any of the three eating disorder symptom measures. Due to the lack of association for all attachment schemas with drive for thinness and bulimia, these two eating disorder symptom measures were excluded from further analyses. As there also lacked correlation between the general attachment schemas and the paternal attachment other schema with all three eating disorder symptom measures (including body dissatisfaction), these predictor variables were also excluded from subsequent analyses.
2. Affect Regulation and Eating Disorder Symptoms

Table 2b: Pearson Product Moment Correlations

<table>
<thead>
<tr>
<th></th>
<th>EDI-Drive for Thinness</th>
<th>EDI-Bulimic Symptoms</th>
<th>EDI-Body Dissatisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>DERS Non-acceptance of Affect</td>
<td>.559(*)</td>
<td>.344</td>
<td>.418</td>
</tr>
<tr>
<td>DERS Goal Oriented</td>
<td>-.163</td>
<td>.157</td>
<td>-.425</td>
</tr>
<tr>
<td>DERS Impulse</td>
<td>.436</td>
<td>.626(**)</td>
<td>.203</td>
</tr>
<tr>
<td>DERS Awareness</td>
<td>-.234</td>
<td>-.257</td>
<td>.021</td>
</tr>
<tr>
<td>DERS Strategies</td>
<td>.463</td>
<td>.712(**)</td>
<td>.086</td>
</tr>
<tr>
<td>EDI-Impulse Control</td>
<td>.159</td>
<td>.033</td>
<td>.312(*)</td>
</tr>
<tr>
<td>EDI-Affect Regulation</td>
<td>.705(**)</td>
<td>.497(**)</td>
<td>.612(**)</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

Table 2b shows that the severity of drive for thinness was associated with non-acceptance of affect and general affect strategies. It is also shown that the severity of bulimic symptoms was associated with impulsivity and emotional problem solving. Furthermore, the severity of body dissatisfaction was associated with impulse regulation and affect regulation.

3. Attachment and Affect Regulation

Table 2c: Pearson Product Moment Correlations

<table>
<thead>
<tr>
<th></th>
<th>EDI-Impulse Control</th>
<th>EDI-Affect Regulation</th>
<th>DERS Non-acceptance of Affect</th>
<th>DERS Goal Oriented</th>
<th>DERS Impulse</th>
<th>DERS Awareness</th>
<th>DERS Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARSQ Self</td>
<td>.173</td>
<td>.119</td>
<td>.426</td>
<td>-.349</td>
<td>.623(**)</td>
<td>-.769(**)</td>
<td>.236</td>
</tr>
<tr>
<td>ARSQ Other</td>
<td>.244</td>
<td>.185</td>
<td>.721(**)</td>
<td>-.143</td>
<td>.286</td>
<td>-.392</td>
<td>.346</td>
</tr>
<tr>
<td>ARSQM Self</td>
<td>-.068</td>
<td>-.155</td>
<td>.143</td>
<td>.300</td>
<td>-.213</td>
<td>.061</td>
<td>.238</td>
</tr>
<tr>
<td>ARSQM Other</td>
<td>-.361(**)</td>
<td>-.285(*)</td>
<td>-.172</td>
<td>.453</td>
<td>-.719(**)</td>
<td>.585(*)</td>
<td>-.393</td>
</tr>
<tr>
<td>ARSQD Self</td>
<td>-.241</td>
<td>-.223</td>
<td>-.145</td>
<td>.350</td>
<td>-.393</td>
<td>.162</td>
<td>-.292</td>
</tr>
<tr>
<td>ARSQD Other</td>
<td>-.206</td>
<td>-.147</td>
<td>.110</td>
<td>.287</td>
<td>-.600(*)</td>
<td>.422</td>
<td>-.131</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Table 2c reveals multiple correlations between attachment and affect regulation. The general attachment self-schema is associated with both impulsivity and emotion awareness, while the general attachment other-schema is associated with the non-acceptance of affect. Although the maternal attachment self-schema does not correlate with the measures of affect regulation, the maternal attachment other-schema correlates with impulse control, affect regulation, impulsivity and emotion awareness. Similarly, the
paternal attachment self-schema does not correlate with the measures of affect regulation, but the paternal attachment other-model is significantly correlated with impulsivity.

Of these significant correlations, the maternal attachment other-schema is the **only** attachment measure that also correlates with eating disorder symptom measures. Given that regression analysis for mediation testing requires significant correlations between all three variables, the maternal attachment other-schema is the only attachment measure that can be used as the predictive variable in the mediation testing.

**Higher Order Analysis: Mediation Model**

Regression analyses were carried out in order to examine whether affect regulation was a possible mediator in the relationship between maternal attachment other-schema (A-RSQ-M) and body dissatisfaction (EDI BD). The total sample (n=58) was considered for meditational analysis. The predictor variable used was the maternal attachment other-schema and the dependent (outcome) variable was body dissatisfaction.

The four different mediation variables used were EDI-Impulse Control (Table 3a), EDI-Affect regulation (Table 3b), DERS Impulsivity and DERS Awareness. These variables were chosen because of their significant correlations with affect and attachment measures, a requirement that must be met in order to test a mediation model. However, when linear regression were conducted with the DERS measures of impulsivity and emotion awarenes, the maternal attachment other-schema no longer predicted body dissatisfaction and thus, we were no longer able to continue testing the mediation model for the two DERS measures, and excluded from further analyses.

<table>
<thead>
<tr>
<th>Table 3a: Regression Analysis to Test Mediation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>n = 58</strong></td>
</tr>
<tr>
<td>1. ARSQ-M Other → EDI IC</td>
</tr>
<tr>
<td>2. ARSQ-M Other → EDI BD</td>
</tr>
<tr>
<td>3. Block 1 EDI IC → EDI BD</td>
</tr>
<tr>
<td>Block 2 ARSQ-M Other → EDI BD</td>
</tr>
<tr>
<td>Sobel’s Test = -1.15</td>
</tr>
</tbody>
</table>

*Note. EDI IR = EDI Impulse Regulation*

<table>
<thead>
<tr>
<th>Table 3b: Regression Analysis to Test Mediation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>n = 58</strong></td>
</tr>
<tr>
<td>1. ARSQ-M Other → EDI AR</td>
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<tr>
<td>2. ARSQ-M Other → EDI BD</td>
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<td>3. Block 1 EDI AR → EDI BD</td>
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<tr>
<td>Block 2 ARSQ-M Other → EDI BD</td>
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<tr>
<td>Sobel’s Test = -2.46</td>
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*Note. EDI AR = EDI Affect Regulation*
Regressions tested for the four criteria that should be met to confirm mediation (Baron & Kenny, 1986). Table 3a shows that the maternal attachment other-schema is associated with impulse control (β = -0.361, p =0.005). Then, in accordance with the second criterion, the maternal attachment other-schema was significantly associated with body dissatisfaction (β = -0.444, p < 0.001). Next, impulse control was significantly associated with body dissatisfaction confirming the third criterion (β = 0.312, p < 0.001). However, not keeping with the fourth criterion, when impulse control was entered into the regression model, the beta coefficient of the association between the maternal attachment other-schema and body dissatisfaction was not significantly reduced. In other words, the strength of the relationship between the maternal attachment other-schema and body dissatisfaction did not significantly decrease when impulse regulation was included as a mediator. Unfortunately, the non-significant mediation effect found in Table 3a (testing EDI-Impulse Control) was repeated in Table 3b (testing EDI-Affect Regulation).

The Sobel’s test (Sobel, 1982) was used to confirm the above findings. Sobel’s test for mediation tests the null hypothesis that the mediated effect is zero. Unstandardized coefficients from the hierarchical regressions were used for the test. Sobel’s test demonstrated that the decrease in beta coefficients was not significant, indicating that affect regulation does not mediate the relationship between attachment and eating disorder symptoms (p>0.05).

Conclusions and Recommendations

The goal of the present study was to understand the relationship between attachment, affect regulation and eating disorder symptoms severity. To begin, the descriptive statistics of the present study show a surprising difference in the means of attachment schemas. Given the great degree of variability in the attachment subscales, one could argue that the present study provides support for both the hierarchy and independent models of attachment representation (as in Liu, 2008). It is interesting to note that attachment varies depending on the reference point for the schema. For example, a general schema relative to mother, relative to father.

Next, we considered the independent relationships between each of the proposed variables to consider whether the findings from previous literature could be replicated.

Attachment and Eating Disorder Symptom Severity

Inconsistent with past research, the present study reveals a lack of significant correlation between attachment measures and eating disorder symptoms. In fact, the only eating disorder symptom to correlate with any attachment schema is body dissatisfaction. This finding directly conflicts with the view held by several authors (as listed in the introduction: Candelori & Ciocca, 1998; Cole-Detke & Kobak, 1996; Ringer & Crittenden, 2007; Zachrisson & Kulbatten, 2006), that eating disorder symptoms are expressions of the psychological and emotional processes constituting attachment patterns.

The lack of correlation is further problematic in that significant correlations are needed for regression analysis. Hence, the mediation testing for the present study was extremely limited as only one of six attachment measures (predictor variables), the
maternal attachment other-schema (A-RSQ-M), correlated with a measure of eating disorder symptoms (outcome variable).

One possible explanation for this lack of correlation may be the recently reported unreliability of questionnaire-style attachment measures. In a review of attachment and eating disorders, Zachrisson and Skarderud (2010) note that there are two main types of attachment measures: questionnaires and interviews. When compared, the agreement between these two types of measures has been found to be very low (Roisman, Holland, Fortuna, et al. 2007). The interview-based attachment assessment is the preferred type of measure in review (Zachrisson & Skarderud 2010), specifically the Adult Attachment Interview (AAI). The AAI is described as more closely linked with the Bowlby tradition in attachment theory, and is the best validated attachment measure for adolescents and adults (Hesse, 2008). However, administering the AII in a clinic setting poses challenges in regards to time, resources and would not likely yield a sufficient sample size given the inconvenience to patients. For these reasons, the AAI is presently not feasible in the current clinical setting.

A more likely explanation for the lack the association of attachment with eating disorder symptoms is offered by Davis, Shuster, Blackmore and Fox (2004). These authors report that general family functioning models, such as attachment, may be too broad of a measure to predict specific pathology. Although general family models (e.g. dysfunction or attachment) has been associated with a multitude of mental health difficulties such as depression, substance abuse, and eating disorders, it may be that these variables contribute to an individual’s vulnerability to mental health issues.

A similar view is taken by Laliberté, Boland and Leichner (1999), who assert that theoretically, the content of what is expressed, valued, and modeled in a family may be more strongly related to the specific symptoms that emerge in specific families (Laliberte et al., 1999). Therefore, it is unlikely that general family variables, such as attachment are related to distinct or specific pathology, although they may interact with specific psychological and biological vulnerabilities in the individual to result in resiliency or pathology.

Affect Regulation and Eating Disorder Symptom Severity (Table 2b)

Consistent with past studies, various affect regulation dimensions were associated with eating disorder symptomology. In particular, consistent with past findings, the non-acceptance of affect and general affect regulation were associated with restrictive symptoms. Also consistent with past findings, impulsivity, emotional problem solving and general affect regulation were associated with bulimic symptoms.

Attachment to Affect Regulation (Table 2c)

Differences in correlations between maternal and paternal attachment schemas with affect regulation are significant. The maternal attachment schema is associated with all four measures of affect regulation (awareness of emotion, impulsivity, impulse control and affect regulation) whereas the paternal attachment schema was only associated with one (impulsivity).

When compared with past research, the discrepancy in correlations between mother and father attachment relationships with affect regulation could be interpreted as
support for either the hierarchy or independent model of attachment representations.

Higher Order Analysis

As only one attachment measure was significantly correlated with both an eating disorder symptom and a measure of affect regulation, all mediation testing was non-ideally limited to one predictor variable: the maternal attachment other schema. An additional limitation to the mediation testing is that the model was limited to a single outcome variable: body dissatisfaction. The exclusion of the EDI drive for thinness and bulimic symptom subscales was detrimental because not only did it limit the number of testable mediation models, but it also limited the results to disordered eating in general, nonspecific to restrictive of bulimic symptoms.

Inconsistent with the predicted model, among the variables that were significantly correlated, none of the affect regulation measures significantly mediated the relationship between attachment and eating disorder symptoms. Thus, contradictory with previous research on affect regulation, and with the prediction of the present study these results suggest that the proposed mediation model does not hold true. However, due to the fact that attachment was found to be generally unrelated to eating disorder symptoms, it is reasonable to conclude that mediation between these two variables would be unlikely.

Next Steps

The original mediation model, as proposed in the introduction, is based on the assumption that there is a significant association between attachment and eating disorders. Thus, the first steps taken must address the lack of correlation found between these two variables. My supervisor and I will meet to discuss further explanations for the existing findings and whether such information can be presented in a manner suitable for publication in a peer reviewed journal. If it is at all possible to condense information gathered in this project for submission to a journal, such steps will be taken. However, given that some of this present finding contradicts existing literature, it is unlikely for this to be the case. Nonetheless, the present results will be presented to the entire Eating Disorder team at the PEDS Program for feedback, as well as next year’s research assistants as an example of research methodology and application to clinical issues.

Knowledge Exchange Plan

Currently, a presentation of this project has been given at one of Dr. Van Blyderveen’s research meetings, with her current students and research assistants. Specifically, the presentation included a background of attachment theory, affect regulation, and current views on their roles in the development and/or maintenance of eating disorders in adolescents. Future plans for knowledge dissemination include a formal presentation of the acquired knowledge to staff members of the Pediatric Eating Disorders Program in the fall.
Future Plans

My academic goals for the immediate future include first, the completion of undergraduate studies with honours in behavioural neuroscience and minor in biology, and second, to attend medical school. I am currently interested and highly motivated to specialize in the research and clinical treatment of child and adolescent mental health, with particular interest in the fields of psychiatry and neuroscience. Following the completion of my specialization, my goal is to work in an applied teaching hospital.

Throughout the course of this award at the Pediatric Eating Disorders Clinic at McMaster University, I have also had the opportunity to work together with Jessica Pan on her CHEO undergraduate study, examining the rates of co-morbidity and adolescent eating disorders. My role has been to act as the second coder (for inter-rater reliability) of the discharged patient files from the McMaster PEDS Program. In conjunction with my current research project, my involvement in the co-morbidity research has provided me with a rewarding and well-rounded research experience. Together, these two research projects have provided me with the opportunity to explore adolescent mental health from both a biological and psychological perspective, which I believe is extremely valuable and will be applicable in both future clinical and research settings.

As stated in the application for this undergraduate research award, it is my goal that through the completion of my undergraduate studies in behavioural neurosciences, together with my experiences working at the Pediatric Eating Disorder Program, I will gain experience and knowledge in both the fields of psychology and medical neurosciences. Continuing my pursuit of an integrated education in the field of mental health, I will be beginning a fourth year thesis in May 2010 in the department of Psychology, Neuroscience and Behaviour, studying neural control of human movement using Transcranial Magnetic Stimulation (TMS). In pursuit of my goal to attend medical school, I have registered to write the Medical College Admission Test in August 2010, and I am currently in the process of preparing medical school applications for admission in the upcoming year.

As I have benefited from the involvement with and mentoring from a previous CHEO Undergraduate Award recipient, I plan to continue my involvement with McMaster Eating Disorder Program throughout my final year of undergraduate studies. It is my hopes that as I continue to develop knowledge and skills in a research setting, that I will also have the opportunity to offer expertise on the research process to future research assistants, and share the knowledge gained from the experience of conducting this research study.
References


