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The Effect of Parental Monitoring on Trajectories of Disordered Eating Attitudes and Behaviors Among Adolescents: An Individual Growth Curve Analysis

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Abstract

The primary aim of the present study was to examine whether parental monitoring, as reported by adolescents *and* their parents, predicts more or less favorable trajectories of disordered eating behavior and attitudes over the course of one year in a sample of adolescent males and females. An additional aim was to explore whether these trajectories vary when study analyses are limited to females. Participants included 87 adolescents (mean age = 15.5 ± 1.4) in mental health treatment and their parents. Self-report measures included the Parental Monitoring Questionnaire, completed at baseline, and the Eating Attitudes Test-Dieting Subscale, completed at baseline as well as 6-month and 12-month follow-ups. Individual growth curve (IGC) analyses were used to examine change in disordered eating behavior and attitudes. Adolescents who reported lower parental monitoring showed trajectories characterized by increases in disordered eating attitudes and behaviors. 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 disordered eating were equally strong. Results may suggest that parents who are less knowledgeable about their adolescents' daily lives, may be less aware of potential disordered eating attitudes and behaviors, and thus less likely to intervene. Findings could be used to inform family-based interventions for this population.

Keywords

Adolescent; Disordered Eating; Eating Attitudes; Eating Behaviors; Parental Monitoring; Family

Disordered eating attitudes and behaviors, including frequent dieting, extreme weight control behaviors (e.g., fasting, skipping meals, self-induced vomiting, diet pills), binge

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Conflict of interest

The authors have no conflict of interest to declare.

eating, and body dissatisfaction are prevalent among adolescents (Croll, Neumark-Sztainer, Story, & Ireland, 2002; Eaton et al., 2010; Ricciardelli & McCabe, 2001; Stice and Whitenton, 2002). 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 et al., 2008) and are common precursors to a diagnosable eating disorder (Patton, Coffey, & Sawyer, 2003; Santonastaso, Friederici, & Favaro, 1999). Research that examines factors that influence adolescent disordered eating attitudes and behaviors are of critical importance in addressing this public health problem.

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; Vidovi , Jureša, Begovac, Mahnik, & Tocilj, 2005) 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; Fosco, Stormshak, Dishion, & Winter, 2012; Fulkerson, Pasch, Perry, & Komro, 2008; Laird, Criss, Pettit, Dodge, & Bates, 2008; Wang, Li, Cottrell, Deveaux, & Kaljee, 2013) as well as internalizing symptoms and behaviors, such as depression, anxiety, and suicidal ideation (Blodgett, Gondoli, Corning, McEnery, & Grundy, 2007; Gil-Rivas, Greenberger, Chuansheng, & Lopez-Lena, 2003; Jacobson & Crockett, 2000; King, Schwab-Stone 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 boys and girls. Greater adolescent report of paternal

monitoring was also associated with lower odds of disordered eating, but only among girls. In a sample of 363 middle-school girls, McVey, Pepler, Davis, Flett, and Abdoell (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 girls' weight concerns were linked to decreases in maternal monitoring, but not paternal monitoring, over the course of three years. For boys, no significant relationship was found between maternal or paternal monitoring 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, & Ochner, 2011), as well as correlates of disordered eating (Croll et al., 2002; Muise, Stein, & Arbess, 2003). Moreover, several studies have shown that parental monitoring is more protective against delinquent behaviors for adolescent females than males (Bowman et al., 2007; 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 suggests that 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. It is important to examine both adolescent and parental perceptions of monitoring as they do not always concur (Racz & McMahon, 2011). 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. We hypothesized that this association would be present in the sample as a whole, and particularly strong among females.

1. Subjects and Methods

1.1. Study population

Participants included 87 adolescents, ages 13 through 18, and their primary caregiver (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 (60.9%) with a mean age of 15.5 (SD = 1.4). The sample was racially (46.5% White, 34.9% African-American, 18.6% “Mixed race/Other”) and ethnically (17.2% Hispanic) diverse. Primary caregivers were primarily female (89.7%) with a mean age of 44.7 (SD = 8.2). The caregivers were also racially (51.8% White; 37.3% African-American; Asian, 2.4%; and 8.4% “Mixed race/Other”) and ethnically (12.6% Hispanic) diverse. Most were biological mothers (72.4%) and fathers (9.2%). Other primary caregivers included adoptive mothers (5.7%), step-mothers (2.3%), step-fathers (1.1%), or other guardians (e.g., grandparents) (9.2%). Marital status varied (47.1% married, 29.4% separated/divorced, 4.7% widowed, 15.3% single/never married, 3.5% single/living with partner). The average annual family income range was 60K-70K (SD = 20-30K).

1.2. 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/STIs, 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 present study were completed via a computer questionnaire with the exception of the Child and Adolescent Services Assessment (Burns, Angold, Magruder-Habib, Costello & Patrick, 1997), which was administered to caregivers in an interview format. 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). All study procedures were approved by the university affiliated institutional review board.

1.3. Study measures

1.3.1. Demographic variables—Demographics were assessed by adolescent self-reported gender, age, race, and ethnicity, and caregiver self-reported gender, age, race, ethnicity, marital status, relationship to adolescent, and annual family income as part of the baseline assessment.

1.3.2. Mental health treatment—The well validated Child and Adolescent Services Assessment (CASA; Burns et al., 1997) interview was used to assess number of minutes adolescents spent in outpatient mental health treatment.

1.3.3. Parental monitoring—The 9-item Parental Monitoring subscale of the Parental Monitoring Questionnaire (PMQ; Stattin & Kerr, 2000) was used to assess degree of parental monitoring. Participants are asked to rate degree of parental knowledge of adolescent whereabouts and various daily activities. Each item is rated on a 5-point Likert scale (1 = 'no, never', 2 = 'some of the time', 3 = 'about half the time', 4 = 'more than half but not always', to 5 = 'yes, always'). Scores range from 1 to 45. Both the adolescent-report and parent-report versions were used. This subscale had high internal consistency (Cronbach's $\alpha = .87$ for adolescents and $.85$ for parents) in the present study.

1.3.4. 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, 6 month, and 12-month follow-up. Participants are asked to choose a response that indicates the frequency of current eating related thoughts and behaviors. Each item in these subscales is rated on a 6-point Likert scale (0 = 'never', 'rarely', 'sometimes', 1 = 'often', 2 = 'usually', 3 = 'always'). Scores range from 0 to 39. The dieting subscale had high internal consistency (Cronbach's $\alpha = .80$ to $.84$) across the three time points in this study. According to Garner, Olmstead, Bohr, and Garfinkel (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".

1.4. Data analysis plan

In preliminary analyses, bivariate relationships between disordered eating attitudes and behaviors (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, minutes seen in mental health treatment over the 12-month study period) were examined.

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 over time 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-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 minutes 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 using 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.

2. Results

2.1. Descriptive statistics

Means, standard deviations, and range of scores for measures of parental monitoring (adolescent and parent report) and disordered eating attitudes and behaviors are presented in Table 1.

2.2. Preliminary bivariate analyses

The scores on the EAT-Dieting subscale were positively skewed (skewness statistic > 2.0). A log transformation was conducted to decrease skew to an acceptable range (skewness statistic < 1.0) (Hopkins & Weeks, 1990). 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 disordered eating attitudes and behaviors (measured at baseline, 6-month follow-up, and 12-month follow-up), adolescent and parent report of parental monitoring (measured at baseline), demographic variables (age and gender measured at baseline), total minutes seen in mental health treatment over the study period (measured at 6 and 12 month follow-up), and study intervention condition (prevention workshop or assessment only). Females reported higher levels of eating disorder attitudes and symptoms than males at 6-month follow-up ($r = .36, p = .004$). Additionally, 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 ($r = -.23, p = .08$). No other significant associations were found. Correlations between the eating disordered attitudes and behaviors and parental monitoring scales can be seen in Table 1.

2.3. Individual growth curve analyses

As can be seen in Table 2, in the first model (unconditional means model), no predictors were included in order to partition the variance within-person and the variance between-person separately. 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 (unconditional linear growth model), time was added as a predictor to examine individuals' EAT-Dieting trajectories over time. 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.

Next, three conditional linear growth models examined the influence of potential covariates (gender, intervention condition, and minutes spent in community based mental health treatment) on EAT-Dieting trajectories. As can be seen in Table 2 (linear growth model with covariates), gender was marginally significant in predicting between-person intercept variance ($\beta = .13, p = .10$), meaning that gender predicted baseline EAT-Dieting scores. Specifically, females reported greater disordered eating attitudes and behaviors at baseline (β

= .15, $p = .05$; data not presented in Table 2). However, gender did not predict slope variance ($\beta = -.04$, $p = .44$) in EAT-Dieting trajectories, meaning gender did not predict the rate of change in EAT-Dieting over the year, and thus was left out of the model presented in Table 2. 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 ($\beta = -.04$, $p = .07$), but there was no significant difference in baseline EAT-Dieting score between the two groups. The main effect of gender and the intervention condition $\times$ time interaction is displayed in the third column of Table 2. Minutes spent in community based mental health treatment did not significantly predict variance in intercept or slope of EAT-Dieting trajectories, and thus was not included in the model depicted in Table 2. To control for gender and intervention condition in all subsequent 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.

2.4. Parental monitoring (adolescent report)

As can be seen in Table 3, results of the linear growth model including parental monitoring (adolescent report) as a predictor of EAT-Dieting trajectories indicates that parental monitoring by adolescent report significantly predicted between-person variance in slope ($\beta = -.01$, $p = .02$). Specifically, these 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.

Parental monitoring $\times$ Time interactions were probed using simple slope analysis. Results indicated that adolescents who reported low levels of parental monitoring at baseline had increasing EAT-Dieting trajectories ($\beta = .11$, $p = .03$). A significant change in the slope of the EAT-Dieting trajectory for adolescents who reported high levels of parental monitoring was not found. 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.

2.5. Parental monitoring (parent report)

As can be seen in Table 3, 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 ($\beta = -.01$, $p = .07$). 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 50.3% 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.

2.6. Parental monitoring in female adolescents

The adolescent- and parent-report of parental monitoring linear growth models were each examined among only female adolescents. As can be seen in Table 4, 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 ($\beta = -.01$, $p = .03$). These results are similar to those found when the same analyses were conducted with the full sample of males and females.

Parental monitoring $\times$ Time interactions were probed using simple slope analysis. 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 with males and females, but reached full significance. A significant change in the slope of the EAT-Dieting trajectory for adolescent females who reported high levels of parental monitoring was not found, consistent with that found in the full sample with males and females.

In sum, adolescent report of parental monitoring significantly negatively impacted disordered eating attitudes and behaviors among females. 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.

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 ($\beta = -.01$, $p = .04$) (see Table 4). Similar results were found in the full sample that included males and females, but only at the trend level. Simple slope analyses used to probe interactions 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.

3. Discussion

The present study explored change in eating attitudes and behaviors over the course of one year in a clinical sample of adolescents in mental health treatment. It also explored the degree to which parental monitoring plays a role in 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. 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. However, between person change was predicted by degree of parental monitoring, offering support for the hypothesis that parental monitoring affects the adolescent developmental trajectory of disordered eating.

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 difficulties. 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. 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; 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 (Stattin & Kerr, 2000; Jacobson & Crockett, 2000; Racz & McMahon, 2011). 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.

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 our growth curve analysis increased our power to detect significant main effects by using all observations, our person-level 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. It would be valuable to replicate this study in a larger more diverse sample that includes more males. Moreover, because the study sample only included treatment seeking adolescents in mental health outpatient treatment, half of whom also received a preventive workshop targeting high risk behavior (alcohol abuse, suicide, and HIV) in the context of the parent research study, results may not readily apply to normative populations or those with unaddressed mental health needs. Though the prevention workshop did not address eating behaviors, it did have a marginal influence on eating outcomes, suggesting that it could have attenuated or altered study findings. It would be of interest to replicate this study in a clinical population of individuals with eating disorders, as well as a normative sample, given that over 50% of adolescent females and 33% of adolescent males use restrictive measures to lose weight at any given time (Neumark Sztainer, 2005). Also of note is that because this study employed a clinical non-eating disordered sample, on average, EAT-Dieting scores were comparable to that found in community-based samples. 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-months (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. According to a study conducted with 1,300 high school students to obtain normative data on the EAT-26 and its subscales (Rosen, Silberg, & Gross, 1988), these scores, on average, place females in 49th to 52nd percentile (range of 12th to 99th percentile) and males in the 58th to 76th percentile (27th to 99th percentile) across assessment time-points. Therefore, though clinical variability existed within this sample, most adolescents reported extreme dieting attitudes and behaviors, and body shape preoccupation associated with eating disorders, at a rate commonly found in community-based adolescent samples. Thus, these results may not apply to samples with greater eating pathology and require replication. Despite the aforementioned limitations, study results add uniquely to existing literature and hold important clinical implications.

4. Conclusions

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 for parental monitoring behavior and teach parents monitoring skills as needed. This may help 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 as the Maudsley Approach) (Lock, Le

Grange, Agras, Moye, Bryson, & Jo, 2010). Further research on the influence of the family environment, particularly parental monitoring, on adolescent disordered eating is warranted.

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Figure 1.
Plot of All Adolescent Individual Growth Curves Reflecting EAT-Dieting Trajectories Over the Course of 12 Months.

Table 1

Intercorrelations Between Parental Monitoring and EAT-Dieting Variables

Variable	M	SD	Range	1	2	3	4	5
1. PMQ – Adolescent Report	30.43	8.46	13-45	-	.25 [*]	.09	-.07	-.23 ⁺
2. PMQ – Parent Report	35.25	6.76	20-45		-	.14	-.08	.01
3. Baseline EAT-26 – Dieting ^a	4.05	4.98	0-28			-	.55 ^{**}	.47 ^{**}
4. 6-mo EAT-26 – Dieting ^a	4.15	5.51	0-30				-	.63 ^{**}
5. 12-mo EAT-26 – Dieting ^a	4.30	5.85	0-33					-

Note: PMQ = Parental Monitoring Questionnaire; EAT-26 = Eating Attitudes and Behaviors Test – 26

^aCorrelations for the EAT-26 – Dieting computed using the log transformation

⁺
p .10

^{*}
p .05

^{**}
p .01

Table 2

EAT-Dieting Individual Growth Curve Analyses Accounting for Significant Covariates

Variable	Unconditional Means Model			Unconditional Linear Growth Model			Linear Growth Model with Covariates		
	β	SE	p-value	β	SE	p-value	β	SE	p-value
Intercept	-.02	.04	.66	-.01	.04	.71	-.02	.04	.55
Time				-.01	.02	.85	-.01	.02	.70
Gender							.13	.07	.10 ⁺
Condition × Time							-.04	.02	.07 ⁺
Model Fit Criterion									
-2LL	143.20			142.25			135.85		

Note. Time = Assessment period (baseline, 6-months, 12-months). Condition = Prevention workshop or assessment only control group.

⁺ p < .10

Table 3

Parental Monitoring as a Predictor of EAT-Dieting Individual Growth Curves Accounting for Significant Covariates

Variable	Linear Growth Model with Covariates			Model Parental Monitoring (Adolescent)			Model Parental Monitoring (Parent Report)		
	β	SE	p-value	β	SE	p-value	β	SE	p-value
Intercept	-.02	.04	.55	-.02	.04	.53	-.02	.04	.56
Time	-.01	.02	.70	-.01	.02	.74	-.01	.02	.71
Gender	.13	.07	.10 ⁺	.14	.07	.06 ⁺	.13	.07	.08 ⁺
Condition × Time	-.04	.02	.07 ⁺	.04	.02	.08 ⁺	.05	.02	.05 ⁺
Parent Monitoring				.00	.00	.56	.00	.01	.40
Parent Monitoring × Time				-.01	.00	.02 [*]	-.01	.00	.07 ⁺
Model Fit Criterion									
-2LL	135.85			130.18			132.65		
% of variance in EAT-Dieting trajectory explained by parental monitoring				70.3			50.3		

Note. Time = Assessment period (baseline, 6-months, 12-months). Condition = Prevention workshop or assessment only control group.

⁺
p .10

^{*}
p .05

Table 4

Parental Monitoring as a Predictor of EAT-Dieting Individual Growth Curves in Females Accounting for Significant Covariates

Variable	Linear Growth Model with Covariates			Model Parental Monitoring (Adolescent)			Model Parental Monitoring (Parent Report)		
	β	SE	p-value	β	SE	p-value	β	SE	p-value
Intercept	.05	.05	.32	.05	.05	.35	.05	.05	.34
Time	-.03	.04	.49	-.01	.03	.81	-.02	.03	.50
Condition $\times$ Time	.07	.04	.05 ⁺	.07	.03	.06 ⁺	.08	.03	.03 [*]
Parent Monitoring				.00	.01	.56	.01	.01	.18
Parent Monitoring $\times$ Time				-.01	.00	.03 [*]	-.01	.01	.04 [*]
Model Fit Criterion									
-2LL	99.00			93.86			94.63		
% of variance in EAT-Dieting trajectory explained by parental monitoring				84.4			83.6		

Note. Time = Assessment period (baseline, 6-months, 12-months). Condition = Prevention workshop or assessment only control group.

⁺ p .10

^{*} p .05