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## Gender Differences in the Relation between Interpersonal Stress and Momentary Shape and Weight Concerns in Youth with Overweight/Obesity

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### Abstract

The purpose of this study was to examine relations between interpersonal stress and momentary shape and weight concerns among pre-adolescent and early adolescent boys and girls with overweight/obesity, using ecological momentary assessment (EMA). We also aimed to determine whether interpersonal stress was differentially related to shape/weight concerns in boys versus girls. Forty youth, ages 8-14 years (53% female), with overweight or obesity reported their state-level shape/weight concerns and negative affect and their recent interpersonal stress (i.e., stress experienced since the last EMA assessment) multiple times a day, for two weeks. Results indicated that interpersonal stress predicted shape/weight concerns in girls but was not related to shape/weight concerns in boys. At the between-person level, higher overall feelings of loneliness and social rejection and a higher overall desire for more friends predicted higher average levels of shape/weight concerns. At the within-person level, higher momentary ratings of loneliness, social rejection, and desire for more friends predicted *lower* shape/weight concerns. These data suggest that the tendency to experience interpersonal stress may be more detrimental to body satisfaction

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Data Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

CRediT authorship contribution statement

**Elizabeth N. Dougherty:** Conceptualization, Formal analysis, Writing - original draft. **Andrea B. Goldschmidt:** Funding acquisition, Resources, Methodology, Project administration, Writing - review & editing, Supervision. **Nicole K. Johnson:** Writing - review & editing. **Krystal Badillo:** Writing - review & editing. **Scott G. Engel:** Funding acquisition, Writing - review & editing, Supervision. **Alissa A. Haedt-Matt:** Funding acquisition, Resources, Methodology, Project administration, Writing - review & editing, Supervision.

Declarations of interest:

None

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for girls with overweight/obesity than for boys with overweight/obesity. Interventions that focus on reducing interpersonal stress may be effective in ameliorating shape/weight concerns in girls with overweight/obesity.

## Keywords

shape/weight concerns; stress; gender differences; pediatric obesity

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## Introduction

Accumulating evidence suggests that body dissatisfaction develops at a young age (León et al., 2018) with children as young as six reporting a desire for a thinner body (Lowe & Tiggemann, 2003). Body dissatisfaction is especially prevalent among children with overweight/obesity (Kelly et al., 2011; Puhl & Latner, 2007; Ricciardelli & McCabe, 2001) given Western ideals related to body size and shape. Research estimates that between 60% and 99% of children and adolescents with overweight/obesity desire a smaller body size (Kelly et al., 2011; Ricciardelli & McCabe, 2001). Children with overweight also report higher levels of body dissatisfaction compared to non-overweight peers (Gouveia et al., 2014). A link between body dissatisfaction and weight status has been found in racially/ethnically diverse samples of youth, including among Black and Latino children (Kimber et al., 2015). In addition, the prevalence of body dissatisfaction among Black and Latino children with overweight is comparable to that among White children with overweight, which supports the relevance of body dissatisfaction across racial/ethnic groups (Kelly et al., 2011; Robinson et al., 1996).

For children and adolescents with overweight/obesity, high levels of body dissatisfaction may confer risk for disordered eating (Goldschmidt et al., 2015). Body dissatisfaction has also been linked to higher levels of anxiety and depression (Goldschmidt et al., 2016; Vannucci & Ohannessian, 2018) and lower self-esteem (Cruz-Sáez et al., 2020). The identification of factors that contribute to body dissatisfaction in youth with overweight/obesity is an important focus of research to prevent the development of eating disorders and other forms of psychopathology in this population. Investigating predictors of body dissatisfaction at the momentary level may be especially informative given that body image has been shown to fluctuate over the course of daily life (Fuller-Tyszkiewicz, 2019). However, few studies have focused on identifying momentary predictors of body dissatisfaction in samples of children and adolescents with overweight/obesity.

Stress is one factor that may contribute to body dissatisfaction in children and adolescents with overweight/obesity (Murray et al., 2013; Murray et al., 2015). Support for this stems from a small body of research in pediatric samples (Murray et al., 2011; Murray et al., 2013). Interpersonal stress may be particularly relevant to the body image of youth, given the importance of peer and family relationships during childhood and adolescence (Camara et al., 2017; Sentse et al., 2010). Indeed, studies have shown that body dissatisfaction is positively associated with a number of interpersonal stressors, including peer pressure (Murray et al., 2011; Murray et al., 2015), low social support (Morken et al., 2019) and

romantic relationship conflict (Murray et al., 2011). Weight-based teasing has also been associated with body dissatisfaction (Puhl & Latner, 2007; Puhl et al., 2017) and this interpersonal stressor is particularly prevalent among youth with overweight/obesity (Puhl & Latner, 2007). In sum, interpersonal stress may play an important role in the development of body dissatisfaction in youth with overweight/obesity. However, to our knowledge, no study has investigated the relation between interpersonal stress and body image at the state level or exclusively in children and adolescents with overweight/obesity. Doing so may be important given the high prevalence of body dissatisfaction in this population (Kelly et al., 2011; Puhl & Latner, 2007) and heightened risk for the development of disordered eating (Loth et al., 2015).

Studies that have investigated interpersonal stress and body dissatisfaction in children and adolescents have relied on retrospective self-report, which has a greater potential for recall bias (e.g., Murray et al., 2011; Murray et al., 2015). More recently, research has utilized ecological momentary assessment (EMA) procedures to investigate naturalistic, momentary predictors of body dissatisfaction and associated constructs in samples of children and adolescents (e.g., Hilbert et al., 2009). EMA involves real-time assessment of factors in the participants' natural environment (Engel et al., 2016). As a result, it has the potential to provide insight into the relation between interpersonal stress and body dissatisfaction, while overcoming many limitations of retrospective self-report methods. To date, no research has used EMA to investigate associations between momentary interpersonal stress and momentary body dissatisfaction in a pediatric sample with overweight/obesity. Such an investigation could yield valuable information to inform the development of effective eating disorder prevention strategies for children and adolescents with overweight/obesity.

It may also be important to consider whether the relation between interpersonal stress and body dissatisfaction differs for girls with excess weight compared to boys with excess weight. Overall, girls report higher levels of body dissatisfaction compared to boys (Bearman et al., 2006; Keel et al., 1997). Girls also experience greater social pressure to conform to cultural appearance ideals compared to boys. For example, adolescent girls report greater pressure from media to conform to cultural appearance standards than adolescent boys (Ata et al., 2007). Girls also receive more appearance-related criticism from male and female peers than do boys (Taylor, 2010). Notably, racial/ethnic minority girls may experience less social pressure to conform to an ultra-thin body standard compared to their white counterparts (Romo et al., 2015). Although, studies have shown that ethnic minority girls with overweight/obesity report similar levels of negative appearance-based commentary (e.g., weight-teasing) from peers and family as white girls (Olvera et al., 2013; van den Berg et al., 2012). Due to increased appearance-related social pressure, girls with overweight may be more likely than boys to attribute stressors to the discrepancy between their actual and ideal body size, which may subsequently contribute to increased body dissatisfaction in response to such stressors. Consideration for potential gender differences in the way interpersonal stress relates to body dissatisfaction may further enhance our understanding of the development of body dissatisfaction in youth with overweight/obesity and may provide valuable information for potential interventions.

The purpose of this study was to investigate whether recent interpersonal stress was associated with state- and trait-levels of body dissatisfaction in a racially/ethnically diverse sample of boys and girls with overweight/obesity, using EMA procedures. This study investigated interpersonal stress relative to a specific facet of body dissatisfaction, namely shape and weight concerns (i.e., negative attitudes towards one's shape and/or weight; Fairburn & Beglin, 1994). This study also investigated whether interpersonal stress was differentially associated with shape and weight concerns in girls versus boys. Based on previous research, we hypothesized that recent interpersonal stress (i.e., stress that occurred during the approximate 3 hours since the last assessment) would be associated with greater state-level shape and weight concerns among boys and girls with overweight/obesity. We also hypothesized that gender would moderate positive relations between recent interpersonal stress and state-level shape and weight concerns, such that these relations would be stronger for girls compared to boys.

## Methods

### Participants

The sample was comprised of 40 children and adolescents ( $M_{\text{age}} = 11.28$ ,  $SD = 1.91$ , range = 8–14 years). Descriptive statistics for the demographic variables are presented in Table 1. All participants had a body mass index (BMI;  $\text{kg}/\text{m}^2$ ) at or above the 85<sup>th</sup> percentile for age and gender ( $M_{\text{BMI}} = 29.75$ ,  $SD = 6.41$ ). Participants were 53% female ( $n = 21$ ) and 65.0% identified as Black or African American ( $n = 26$ ), 15.0% as Hispanic or Latino ( $n = 6$ ), 15.0% as White ( $n = 6$ ), and 2.5% as Asian ( $n = 1$ ). Study inclusion criteria required that participants be able to read and understand English and read at or above a third grade reading level. Participants were excluded from the study if they were taking medication or had a medical condition that could influence their appetite or weight, were involved in concurrent weight loss treatment, or had current diagnoses of Anorexia Nervosa or Bulimia Nervosa.

### Procedure

Study procedures were approved by institutional review boards prior to data collection. Parents of children provided written informed consent and children provided written informed assent. Children were recruited through referrals from pediatricians' offices, advertisements distributed throughout the community, and contact logs from previous studies. A phone screen was used to determine eligibility. Children who were eligible to participate attended an in-person visit with their caregiver. During this visit, a research assistant measured the children's height and weight using a calibrated digital scale and stadiometer. Next, the children completed the demographic questionnaire and received training in how to complete the EMA procedures.

Children completed the EMA ratings using a smartphone. Children who did not own a smartphone were loaned one for the duration of the study. Children completed three types of EMA ratings over a period of 16 days: (a) signal-contingent (completed in response to prompts sent at semi-random times throughout the day), (b) interval-contingent (completed in response to prompts sent at specific intervals throughout the day), and (c)

event-contingent (initiated by the participant following a discrete event or behavior; Wheeler & Reis, 1991). The first two days of the EMA protocol were considered a practice period intended to familiarize participants with the EMA procedures. Data from practice days were not used in statistical analyses. Signal-contingent prompts occurred five times per day on weekends (between 8:00am and 9:00pm) and three times per day on weekdays (between 7:00am and 8:00am, 3:00pm and 4:00pm, and 6:00pm and 7:00pm). Interval-contingent recordings occurred once a day before bed. Participants were not required to respond to signal- and interval-contingent prompts within a certain timeframe.

Children self-initiated event-contingent recordings after every eating episode. During the EMA protocol, research assistants contacted the children via telephone to facilitate adherence with the study procedures. After children completed the EMA ratings, they returned with their caregivers for a follow up visit to return the smart phone if they had borrowed one. Children were compensated \$100 for completing the initial and follow-up visits, and they could earn up to \$50 for completing the EMA recordings. Participants who completed at least one week of EMA ratings ( $N = 40$ ) were included in the final analyses.

## Measures

**Baseline Measures**—Children completed a demographic questionnaire which assessed their age, race/ethnicity, and grade in school. The demographic questionnaire also assessed participants' gender (female or male). Participants' height and weight were measured using a digital scale and stadiometer. The Center for Disease Control and Prevention growth charts were used to convert BMI scores to BMI-Z scores (Kuczmarski et al., 2000).

**EMA Measures**—To assess the interpersonal stress, children responded to five items about the extent to which they experienced various interpersonal stressors since their last rating (“Have you felt lonely?; Have you argued with someone?; Have you felt rejected by anyone? Have you wished your relationships were better?; Have you wished you had more friends?”). These items were derived from the Social Adjustment Scale-Self Report (Weissman & Bothwell, 1976). These items have been used in other EMA research with youth (Ranzenhofer et al., 2014). Participants responded to these items on a 5-point point scale ranging from 1 (*not at all*) to 5 (*a lot*). Each item represented a separate interpersonal stressor variable.

To assess momentary shape and weight concerns, children completed five items that inquired about feelings of fatness and dissatisfaction and discomfort with body shape and weight at the present moment (“Please indicate how much you feel this way right now: How fat do you feel?; How unhappy are you with your weight?; How unhappy are you with your shape?; How uncomfortable or embarrassed do you feel seeing your own body?; How uncomfortable or embarrassed do you feel about other people seeing your body?”). These questions were adapted from the Youth Eating Disorder Examination-Questionnaire (YEDE-Q; Goldschmidt et al., 2007), modified for momentary assessment in this pilot study. The YEDE-Q has demonstrated good concurrent validity in previous research with youth (Goldschmidt et al., 2007). Participants responded to momentary shape and weight concern items on a 7-point scale ranging from 1 (*not at all*) to 7 (*very much*). There was high internal

consistency among items ( $\alpha = .94$ ); therefore, they were totaled to create a composite score for momentary shape and weight concerns.

### Statistical analyses

Data analyses were performed using IBM SPSS 26.0 (IBM Corporation, Armonk, NY). Generalized estimated equations (GEE) were used to examine associations among interpersonal stressors and momentary shape and weight concerns and examine whether these associations varied according to gender. We chose to use GEE because our primary aim was to investigate population-based gender differences. The data were fit using a gamma distribution, a log link function, and an autoregressive covariance structure. Separate GEE models were estimated for each predictor variable. In the GEE models, person-mean centered predictors represented within-person effects and grand-mean centered predictors represented between-person effects. Preliminary analyses were conducted to determine whether models should be adjusted for negative affect (assessed via the Positive and Negative Affect Schedule; Watson et al., 1988) and other potential confounders including age and BMI-Z. Negative affect, age, and BMI-Z were not significant predictors of shape and weight concerns; therefore, they were not included as covariates in the subsequent GEE models.

## Results

### Descriptive information

A total of 1,655 EMA ratings were included in the analysis. This included 1,112 signal-contingent ratings, 385 interval-contingent ratings and 158 event-contingent ratings. The overall sample completed 56% of signal-contingent ratings, 68.8% of interval-contingent ratings, and an average of 3.59 event-contingent recordings during the assessment period. Girls completed a total of 932 EMA ratings during the two-week period, including 625 signal-contingent ratings, 215 interval-contingent ratings, and 92 event-contingent ratings. Girls completed 59% of signal-contingent ratings, 73% of interval-contingent ratings, and an average of 4.38 event-contingent ratings during the assessment period. Boys completed a total of 723 EMA ratings during the two-week period, including 487 signal-contingent ratings, 170 interval-contingent ratings, and 66 event-contingent ratings. Boys completed 51% of signal-contingent ratings, 64% of interval-contingent ratings, and an average of 3.47 event-contingent ratings during the assessment period.

Overall, adherence rates were considerably lower than those reported in other studies that have used EMA with children and adolescents (e.g., Ranzenhofer et al., 2014). The total number of completed EMA ratings was not associated with overall levels of shape and weight/concerns ( $p = .422$ ) or interpersonal stress ( $ps = .277 - .705$ ). In addition, the total number of completed EMA ratings did not differ between boys and girls ( $p = .316$ ). The average amount of time that elapsed between completed EMA ratings (including all types of ratings) was approximately 3 hours for both boys and girls.

Boys reported a higher average desire for more friends than girls ( $p = .016$ ). Boys and girls did not differ in terms of their average levels of the remaining interpersonal stressors (i.e.,

feeling lonely, having an argument, feeling rejected, desiring better relationships;  $ps = .126 - .955$ ). Boys and girls also did not differ in terms of their average levels of shape and weight concerns ( $p = .413$ ) or negative affect ( $p = .473$ ) during the two-week period.

### Hypothesis tests

The results of the GEE models are presented in Table 2. Gender moderated the between-person effect of loneliness on shape and weight concerns ( $p < .001$ ), such that higher overall loneliness predicted higher average ratings of shape and weight concerns in girls ( $\beta = 2.92$ ,  $p < .001$ ), but was not related to shape and weight concerns in boys ( $\beta = .26$ ,  $p = .325$ ). Gender also moderated the within-person effect of loneliness on shape and weight concerns ( $p < .001$ ). In this case, higher momentary ratings of loneliness predicted lower shape and weight concerns in girls ( $\beta = -2.94$ ,  $p < .001$ ) but was not related to shape and weight concerns in boys ( $\beta = -.19$ ,  $p = .470$ ).

In the model investigating social rejection, gender moderated the between-person effect of social rejection on shape and weight concerns ( $p < .001$ ). Specifically, higher overall feelings of social rejection predicted higher average ratings of shape and weight concerns in girls ( $\beta = 4.56$ ,  $p < .001$ ) but was not associated with shape and weight concerns in boys ( $\beta = .20$ ,  $p = .076$ ). Gender also significantly moderated the within-person effect of social rejection on shape and weight concerns ( $p < .001$ ), indicating that higher momentary ratings of social rejection predicted lower shape and weight concerns in girls ( $\beta = -4.58$ ,  $p < .001$ ) but not boys ( $\beta = -.16$ ,  $p = .157$ ).

With respect to the model examining desire for more friends, gender moderated the between-person effect of desire for more friends on shape and weight concerns ( $p = .030$ ), such that higher overall desire for more friends predicted higher average ratings of shape and weight concerns in girls ( $\beta = .39$ ,  $p < .001$ ) but not boys ( $\beta = .10$ ,  $p = .247$ ). Gender also moderated the within-person effect of desire for more friends on shape and weight concerns ( $p = .017$ ), indicating that higher momentary desire for more friends predicted lower shape and weight concerns in girls ( $\beta = -.39$ ,  $p = .001$ ) but not boys ( $\beta = -.04$ ,  $p = .632$ ). There were no significant effects in the models investigating the remaining interpersonal stressors (i.e., having an argument and desiring better relationships;  $ps = .059 - .456$ ).

### Discussion

The present study investigated associations between interpersonal stress and shape and weight concerns in a sample of youth with overweight/obesity using EMA. We also investigated whether relations between interpersonal stress and shape and weight concerns differed for girls versus boys. The results provide partial support for the hypotheses in that interpersonal stress was associated with shape and weight concerns in girls, but was not significantly related to shape and weight concerns in boys. Further, among girls, interpersonal stress predicted higher shape and weight concerns at the trait-level, but lower shape and weight concerns at the state-level.

Overall, the results support and extend previous literature by demonstrating a link between interpersonal stress and shape and weight concerns among girls with overweight/obesity,

using EMA. Further, they suggest that the tendency to experience interpersonal stress may be more detrimental to body satisfaction for girls with overweight/obesity, than for boys with overweight/obesity.

As expected, higher overall feelings of loneliness and social rejection, and a higher overall desire for more friends predicted higher average shape and weight concerns in girls.

Thus, girls who generally experienced greater interpersonal stress than others reported higher average levels of shape and weight concerns over the two-week period. These results are consistent with findings from retrospective studies, indicating that stress in social relationships may play a role in promoting body image disturbance in girls (Murray et al., 2011; Murray et al., 2015). Girls with overweight/obesity commonly experience weight-related teasing and social rejection (Gunnardottir et al., 2012; Puhl & Latner, 2007) and are more likely to be socially isolated compared to average-weight peers (de la Haye et al., 2017; Strauss & Pollack, 2003). For girls with overweight/obesity, weight stigmatization in social relationships may facilitate feelings of loneliness and social rejection and a desire for more friends, which may in turn, contribute to shape and weight concerns.

In contrast to previous research (Murray et al., 2011; Murray et al., 2015), we did not find evidence that interpersonal stress promotes trait-level shape and weight concerns in boys. Gender differences in between-person associations among interpersonal stressors and shape and weight concerns may stem from differential pressures to conform to appearance ideals and weight-stigmatization in girls versus boys (Esnaola et al., 2010; Tang-Péronard & Heitmann, 2008). Girls report more frequent body surveillance and scrutiny from same-sex peers than do boys (Kenny et al., 2017). Girls with overweight also experience higher rates of weight-based teasing compared to boys with overweight (Goldfield et al., 2010; Tang-Péronard & Heitmann, 2008) and are more likely to be socially excluded as a result of their weight-status (Tang-Péronard & Heitmann, 2008). Based on this, interpersonal stressors may be associated with trait-level shape and weight concerns in girls and not boys because girls are more likely to attribute these stressors to their body weight. Girls may also be more likely than boys to believe that being socially accepted is conditional on their appearance, which may make interpersonal stressors such as loneliness, particularly detrimental to their body image.

Gender differences in between-person associations among interpersonal stressors and shape and weight concerns may also relate to differences in the level of importance that girls and boys place on social connectedness and social relationships. In general, girls place more importance on social belonging and social connectiveness than do boys (Rose & Rudolph, 2006). Girls are also more likely than boys to describe themselves in terms of their social relationships, suggesting that relationships play a more central role in shaping their self-concept (Rose & Rudolph, 2006). Given the importance of social relationships for girls, interpersonal stress may be particularly detrimental to their sense of self-worth, making them more vulnerable to experiencing shape and weight concerns (Murray et al., 2013). Future research should investigate whether trait-level factors such as self-esteem could account for differential associations between interpersonal stress and shape and weight concerns across genders.



Contrary to expectations, higher momentary ratings of recent social rejection, loneliness, and desire for more friends predicted *lower* shape and weight concerns in girls. Thus, girls who experienced higher interpersonal stress in the approximate 3 hour period since their previous assessment were more likely to report lower state-level shape/weight concerns. In the moment, interpersonal stress may function as a temporary distraction from negative feelings about the body, which protects against shape and weight concerns. Theoretically, negative affect may contribute to shape and weight concerns because negative emotions are funneled into more controllable negative feelings about the body (Keel et al., 2001). When girls experience interpersonal stress, their attention may shift off of their body and onto the stressor, making it less likely that negative emotions are funneled into shape and weight concerns.

Another possibility is that girls engaged in maladaptive coping responses which temporarily reduced their negative emotions and protected against shape and weight concerns. For example, girls may have coped with feelings of social rejection by seeking reassurance from others about their likability, which provided them momentary relief from emotional distress (Gillett & Mazza, 2018). Although maladaptive interpersonal behaviors may reduce negative emotions in the short-term (Gillett & Mazza, 2018), they may increase psychological symptoms and interpersonal stress in the long-term (Prinstein et al., 2005; Stroud et al., 2018), which may explain why interpersonal stress was associated with lower shape and weight concerns at the state-level and higher shape and weight concerns at the trait-level. Interpersonal stress did not significantly predict state-level shape and weight concerns in boys. Gender differences in within-person associations among interpersonal stressors and shape and weight concerns could reflect differential tendencies for boys and girls to engage in maladaptive interpersonal behaviors in response to stress, with girls engaging in these more often than boys (Felton et al., 2019; Rose & Rudolph, 2006). Future work should explore whether momentary behavioral responses to interpersonal stress could explain the observed gender differences and associations with trait-level and state-level shape and weight concerns.

### Limitations and strengths

The present study had several limitations that are important to note. The sample size was relatively small and there was moderate adherence with EMA ratings. In addition, participants self-initiated event-contingent recordings in response to a limited number of eating episodes ( $M = 3.59$ ) during the two-week period. Missing data due to nonadherence with EMA ratings and the small sample size may have reduced power to detect significant effects and increased the risk of spurious findings. One potential explanation for participants' modest adherence with EMA ratings may be that they felt overburdened by the number of signaled assessments in the EMA protocol. It may also be that children in our study were not used to carrying around or operating a mobile device, which made them less vigilant about monitoring it for EMA prompts during the two-week period. Future research should attempt to replicate the findings with a larger sample of youth and explore additional strategies to enhance youth adherence with EMA ratings.

The items used to assess shape and weight concerns in the present study did not take into account gender-specific facets of body image, such as concern about muscularity. Adolescent boys report greater concern about muscularity compared to adolescent girls (Hoffmann & Warschburger, 2017). Future research should investigate the relation between interpersonal stress and body dissatisfaction in children and adolescents with overweight using measures that assess concerns about weight and shape and concerns about muscularity to more comprehensively evaluate body dissatisfaction. The items used to assess momentary shape and weight concerns and interpersonal stress were adapted from validated self-report measures. However, further validation of the momentary items in pediatric samples is needed. This study is correlational; thus, it is not possible to draw conclusions about causal connections between interpersonal stress and shape and weight concerns. The sample was comprised of children aged 8 to 14. Thus, the results may not generalize to younger children or older adolescents. Lastly, the demographic questionnaire that was used provided two response options for gender (male or female). Future research should explore associations between interpersonal stress and shape and weight concerns among youth with non-binary gender identities.

This study also has several strengths. The majority of the sample was non-white; therefore, the results may be representative of ethnically and racially diverse youth. In addition, this study is the first to utilize EMA to investigate the relation between interpersonal stress and shape and weight concerns in children and adolescents with overweight/obesity. Thus, it provides more ecologically valid information about the relation between these constructs in youth.

## Conclusions

Children and adolescents with overweight/obesity report increased levels of body dissatisfaction compared to non-overweight peers (Gouveia et al., 2014) which may put them at increased risk for developing disordered eating (Goldschmidt et al., 2015). Knowledge about factors that predict body dissatisfaction in children and adolescents with overweight/obesity is crucial to the development of effective eating disorder prevention programs for these individuals.

Overall, the results of this study make an important contribution to the literature by suggesting that daily interpersonal stress may be especially detrimental to the body image of girls with overweight/obesity. Interventions that focus on reducing interpersonal stress may be effective in ameliorating shape and weight concerns and preventing the development of eating disorders in girls with overweight/obesity.

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**Highlights:**

- Interpersonal stress predicted momentary shape/weight concerns in girls.
- Interpersonal stress was not related to shape/weight concerns in boys.
- Girls with higher average stress reported higher average shape/weight concerns.
- Girls with higher recent stress reported lower shape/weight concerns.

**Table 1.**

## Demographic Characteristics by Gender

	Male	Female	Total Sample
Age, <i>M(SD)</i>	11.10(1.96)	11.42(1.886)	11.28(1.19)
BMI, <i>M(SD)</i>	28.61(6.276)	30.77(6.503)	29.75(6.41)
Race, <i>n (%)</i>			
Black	10(52.6%)	16(76.2%)	26(65%)
White	4(21.1%)	2(9.5%)	6(15%)
Asian	1(5.3%)	--	1(2.5%)
Hispanic/Latino	4(21.1%)	2(9.5%)	6(15.0%)

*Note.* BMI = Body Mass Index, SD = Standard Deviation

*N*(females) = 21, *N*(males) = 19

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**Table 2.**

GEE Models of Interpersonal Stress and Gender as Predictors of Shape/Weight Concerns

	Effect level	<i>B</i>	<i>SE</i>	95% confidence interval		Wald $\chi^2$	<i>p</i>
				Lower	Upper		
Intercept	—	2.670	.142	2.391	2.949	351.118	.000
Gender	—	-.360	.189	-.730	.011	3.622	.057
Lonely	Between	.260	.272	-.273	.792	.915	.339
	Within	-.191	.272	-.723	.341	.494	.482
Gender × Lonely	Between	<b>2.658</b>	<b>.552</b>	<b>1.576</b>	<b>3.740</b>	<b>23.172</b>	<b>&lt;.001</b>
	Within	<b>-2.740</b>	<b>.555</b>	<b>-3.828</b>	<b>-1.652</b>	<b>24.358</b>	<b>&lt;.001</b>
Intercept	—	2.656	.147	2.368	2.944	326.920	.000
Gender	—	-.048	.196	-.432	.337	.059	.808
Rejected	Between	.196	.118	-.035	.428	2.774	.096
	Within	-.151	.115	-.376	.075	1.719	.190
Gender × Rejected	Between	<b>4.365</b>	<b>.954</b>	<b>2.495</b>	<b>6.234</b>	<b>20.936</b>	<b>&lt;.001</b>
	Within	<b>-4.411</b>	<b>.955</b>	<b>-6.283</b>	<b>-2.539</b>	<b>21.326</b>	<b>&lt;.001</b>
Intercept	—	2.669	.142	2.390	2.947	352.827	.000
Gender	—	-.285	.220	-.717	.147	1.673	.196
Argued	Between	.121	.094	-.063	.305	1.665	.197
	Within	-.095	.093	-.278	.088	1.033	.310
Gender × Argued	Between	-.533	.379	-1.275	.209	1.979	.159
	Within	.548	.381	-.199	1.295	2.068	.150
Intercept	—	2.658	.141	2.383	2.934	356.718	.000
Gender	—	-.173	.227	-.618	.273	.578	.447
Better relationships	Between	.128	.068	-.005	.261	3.575	.059
	Within	-.079	.069	-.214	.055	1.336	.248
Gender × Better relationships	Between	.281	.377	-.458	1.020	.557	.456
	Within	-.324	.378	-1.066	.417	.734	.391
Intercept	—	2.665	.137	2.397	2.933	380.237	.000
Gender	—	-.255	.193	-.634	.124	1.745	.186
More friends	Between	.104	.088	-.069	.277	1.394	.238
	Within	-.045	.089	-.220	.131	.248	.619
Gender × More friends	Between	<b>.286</b>	<b>.132</b>	<b>.028</b>	<b>.544</b>	<b>4.728</b>	<b>.030</b>
	Within	<b>-.348</b>	<b>.146</b>	<b>-.634</b>	<b>-.062</b>	<b>5.699</b>	<b>.017</b>

Note. Bold font indicates significant ( $p < .05$ ) effects. Gender was coded such that males represent the reference category.