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ORIGINAL ARTICLE

Anti-fat attitudes and dietary restraint within mother-daughter dyads: an Actor-Partner Interdependence Model (APIM) analysis

Ellen Hart[1] · **Cin Cin Tan**[2] · **Chong Man Chow**[1]

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Abstract

Purpose This study examined the association between anti-fat attitudes (fear of fat, dislike of fat, willpower) and dietary restraint within the mother–daughter relationship.

Methods Mother–adolescent daughter dyads ($N_{pairs} = 100$) were recruited from a Midwestern community to participate in a study together. They completed self-report measures of anti-fat attitudes and eating behavior. Data were analyzed with an Actor–Partner Interdependence Model (APIM).

Results Significant actor effects for mothers include fear of fat ($b = 0.270$, $B = 0.319$, $p < 0.05$) and willpower ($b = 0.228$, $B = 0.280$, $p < 0.05$) predicting her own dietary restraint. For daughters, fear of fat ($b = 0.554$, $B = 0.612$, $p < 0.05$) and dislike ($b = 0.202$, $B = 0.214$, $p < 0.05$) predict her own dietary restraint. Regarding partner effects, mothers' fear of fat was related to daughters' dietary restraint ($b = 0.126$, $B = 0.138$, $p < 0.05$), and daughters' dislike was related to mothers' restraint ($b = 0.257$, $B = 0.294$, $p < 0.05$). Regarding dyad-level interaction effects, mother and daughter fear of fat interacted to predict daughter dietary restraint ($b = 0.184$, $B = 0.201$, $p < 0.05$), such that when both mother and daughter fear of fat is high, daughters appear to engage in more dietary restraint.

Conclusions Given the role of mothers' fear of fat in daughter eating behavior, parent-focused or parent-involved interventions may improve family culture around weight and eating, contributing to better adolescent outcomes.

Level of evidence V, cross-sectional descriptive study.

Keywords Anti-fat attitudes · Dislike · Fear of fat · Willpower · Dietary restraint · Parent–child · Adolescence

Introduction

Dieting and weight concerns are common problems among adolescent girls. During this time period, many girls engage in persistent dieting with the intention of losing weight [1]. Many researchers have attributed adolescent weight management behaviors to a desire and social pressure for thinness [2]; however, the alternative drive to avoid weight gain or "fatness" has been identified as a stronger competing motivation behind dieting among women [3, 4]. Negative attitudes towards fatness are common in Western society, with heavier individuals (particularly women) viewed as unhappy, undesirable, passive, and to blame for their weight status [5, 6]. Numerous past studies have identified negative attitudes towards fatness as a risk factor for dietary restraint, intentional restriction of caloric intake in order to lose weight [4, 7, 8].

A wide body of literature addresses the ways in parents, particularly mothers, may influence their daughter's eating behavior (e.g. [9]). Mothers have an important role in the development of their child's eating via both feeding and modeling [10–12], and the disordered eating of mothers and daughters is highly related [13]. However, limited research has addressed the interactive role between mother's and daughter's anti-fat attitudes in jointly predicting each of their eating outcomes. To better understand the dyadic dynamics that operate within mother–daughter relationships, the current study examined the relationship between anti-fat attitudes and dietary restraint from an interdependence theory perspective [14].

✉ Ellen Hart
ehart4@emich.edu

[1] Eastern Michigan University, Ypsilanti, MI, USA

[2] University of Toledo, Toledo, OH, USA

Individual level research on anti-fat attitudes

Negative attitudes towards fatness and fat people, or anti-fat attitudes, are prevalent and widespread in the western world [15, 16] and have been widely studied at the individual level. Anti-fat attitudes can be conceptualized as three distinct domains: one's personally directed fear of becoming fat ("Fear of Fat"), prejudice related to heavy weight status ("Dislike"), and belief in the cause of obesity and ability to control weight ("Willpower"), each of which is associated with disordered eating behavior [17].

Fear of fat

A primary factor considered among anti-fat attitudes is one's personal fear of gaining weight or being fat. Fear of fat is a highly personal and internal construct, contrary to dislike and willingness, which involve judgements about others. Research suggests that fear of fat is highly prevalent in Western culture, particularly among women [4, 17]. This is unsurprising, given the threat of prejudice and discrimination that exist for individuals of a high weight status [18]. These wide-spread negative attitudes are concerning due to their relationship with disordered eating behavior. While traditional wisdom suggests that holding anti-fat attitudes (particularly fear of fat) might motivate people to engage in healthy weight control strategies to avoid weight gain, research more commonly shows engagement in restrictive eating patterns may contribute to weight gain over time [7, 8, 19]. As such, shaming or fear-mongering against obesity does not appear to be an effective strategy for healthy weight management. Fear of fat is an anxiety-related construct in that it involves worry about the future, and individuals with high fear of fat might be expected to engage in behavior to reduce that fear, such as engaging in dietary restraint.

Dislike

Obesity is highly stigmatized, with overweight and obese individuals routinely subject to prejudice in education, healthcare, the workplace, and interpersonal relationships [15, 17, 18]. Further, overt stigma against heavy weight and obesity is still relatively socially acceptable in public discourse as compared to negative attitudes towards other marginalized groups (i.e., racism, sexism, etc.) [20]. Negative attitudes towards fatness have been found to be unrelated to one's own weight status, instead revealing more ideological views regarding the value, or disvalue, of overweight and obese individuals [6]. Children are not excluded from these negative beliefs, and even preschoolers are aware of the unacceptability of heavy weight status [21]. As children age, they continue to display strong implicit bias against fatness [22]. Among women, this bias against fatness has been associated with dietary restraint [23]. If a person holds negative views regarding heavy weight, they will be more likely to engage in weight management strategies, such as dietary restraint, to avoid becoming heavier.

Willpower

The dominant social narrative around overweight and obesity states that heavy individuals are to blame for their weight due to laziness or lack of willpower [18]. This belief persists despite substantial evidence suggesting the unchangeable factors such as genetics and metabolic functioning are significant factors in determining weight beyond diet (e.g., [24, 25]).

The implicit message in this assumption is that individuals of higher weight status are responsible for their weight. This belief in one's individual behavior as a causal factor in their weight status (i.e., as compared to illness or heredity) is highly related to weight stigma [26]. Conceptually, it follows that if weight status is believed to be controllable with appropriate willpower, an individual will work to control their weight, potentially via dietary restriction. In this way, higher belief in personal responsibility for weight would be related to higher engagement in weight control behaviors, such as dietary restraint.

Dyadic association between anti-fat attitudes and restrained eating

Past research on anti-fat attitudes and eating behavior has focused on the individual level, such as how individuals' anti-fat attitudes are related to their own eating behaviors. However, a person's anti-fat attitudes may also influence others.

Past research has cited the societal and family emphasis on thinness as a risk and maintenance factor for both clinical and subclinical levels of disordered eating among pre-adolescent and adolescent girls [2, 27, 28], taking the form of both direct feedback and more indirect messaging, such as modeling, self-directed comments, and potentially, attitudes towards fatness [9]. It is likely that parental fear of fat also promotes disordered eating among children (described at the individual level by Dalley and colleagues) [3, 4]. A mother's fear of becoming fat is predictive of fear for her child becoming fat and engagement in restrictive feeding choices, which may later influence her child's independent dietary choices [29]. As such, adolescent daughters may engage in dietary restraint in response to their mother's fears of personal or family weight concerns. Regarding dislike of fat, research is mixed whether maternal prejudice towards fatness is related to maternal or child-driven caloric

restriction [29, 30]. At minimum, weight bias is common within the family setting, and parents are not immune from prejudice towards fatness, even among their own children [31]. Maternal dislike of fat may be related to a desire to avoid fatness by dietary restraint among daughters. One's belief in the personal power to change weight may also be related to eating behaviors among others. Literature suggests that parental pressure around eating is related to increased dietary restraint among young girls [11]. Parental emphasis on one's ability to gain or lose weight with effort likely supports a daughter's engagement in dietary restraint during adolescence, a time when many teens believe they are too heavy [1].

Within families, research has overwhelmingly focused on the way that parental characteristics impact adolescent outcomes, suggesting a one-way mechanism of influence. However, in adolescence, the parent–child relationship changes from clearly hierarchical to more egalitarian [32, 33] and family norms are co-constructed between parent and child [34]. As such, it is likely that daughter characteristics, including their anti-fat attitudes, may also influence their mother's eating behavior.

Interaction of mother and daughter characteristics

As described above, numerous studies provide evidence to suggest that anti-fat attitudes are independently related to eating behavior among both adolescents and adult women [7, 8]. Further, a mother's anti-fat attitudes may impact her daughter's eating behavior, and vice versa. Due to the close nature of mother-adolescent daughter relationships, their characteristics cannot be considered completely independently [14]. Mothers and adolescent daughters likely coregulate their attitudes, emotions, and behavior with one another in a way similar to adult relationships, such that a change in state for one partner impacts the experience of the other [35]. Within a dyad, it is likely that the dyadic combinations of mothers' and daughters' attitudes may predict each of their own eating behaviors. For instance, if two partners both have high fear of fat (an anxiety related construct), related anxiety-modulation behaviors (such as dietary restraint) would be expected to intensify among both. Similarly, when both mothers and daughters exhibit high levels of prejudice towards fatness, such an attitude may further escalate their dietary restraint. Finally, for dyads in which both partners have high willpower beliefs, both mothers and daughters are expected to engage in more dietary restraint than dyads in which only one partner has a willpower belief.

Overview of the current study

An Actor-Partner Interdependence Model (APIM) [36] was used to investigate the dyadic nature of anti-fat attitudes and dietary restraint between mothers and daughters with the actor, partner, and actor–partner interaction effects. First, the actor effects examined the association between mothers' anti-fat attitudes (fear of fat, dislike, willpower) and mothers' dietary restraint, as well as the association between daughters' anti-fat attitudes and daughters' dietary restraint. We hypothesized that more mothers' and daughters' anti-fat attitudes will be associated with increases in their own dietary restraint. Second, the partner effects examined the association between mothers' anti-fat attitudes and daughters' dietary restraint, as well as the association between daughters' anti–fat attitudes and mothers' dietary restraint. We hypothesized that higher anti-fat attitudes in one partner will be related to more dietary restraint in their partner. Finally, the actor–partner interaction effects examined the combinations of mothers' and daughters' anti-fat attitudes when predicting each of their eating behaviors. We hypothesized that dietary restraint will be highest in mothers and daughters when both members show higher levels of anti-fat attitudes. Further, we hypothesized that the relationship between one partner's anti-fat attitude and their dietary restraint can be minimized by the other member's lower anti-fat attitudes.

Method

Procedures

Mother-daughter dyads were recruited from a Midwestern metropolitan area, USA. Participation in the study was restricted to mothers who (a) had an adolescent daughter between the ages of 11 and 18 and (b) typically conversed in English with their daughter. Flyers were posted on webpages (e.g., Facebook, Craigslist) and at local community centers (e.g., colleges and schools) to recruit dyads interested in participating in research about adolescent social relationships and psychological and physical health. Mother–daughter dyads interested in the study contacted the researchers and scheduled a laboratory visit, during which dyads were informed of the nature of the study and provided informed consents/assents. Adolescents and mothers then completed computer-administered surveys in separate rooms. Both members also completed two video-recoded interactions, but the observational data were not reported in the current study [37]. Each dyad received a $40 grocery gift-card for their participation.

Participants

The current sample included 100 adolescent girls (M_{age} = 14.15 years, SD = 2.75) and their mothers (M_{age} = 44.03 years, SD = 7.23). About 48% of the adolescents were White, followed by African American (30%),

mixed race/Other (15%), Asian (4%), Hispanic (2%), and Middle Eastern (1%). The majority of the adolescents came from middle class families, and 79% of the mothers reported household income of $35,000 or above and 90% of the mothers had at least some college education. With regard to marital status, 60% of the mothers reported that they were married, 14% were single, 17% were divorced, and 9% were either widowed or other relationship status. Mothers' and daughters' body mass index (BMI; kg/m^2) were computed based on their self-reported weight and height. In order to adjust for the adolescents' age, their BMI scores were converted into percentiles. For this study, mothers' mean BMI fell in the obese range (M = 30.24; SD = 7.56) and daughters' mean BMI percentile fell in the healthy range (M = 63.87, SD = 27.56).

Measures

Weight attitudes

To measure weight attitudes, mothers and daughters completed the Anti-Fat Attitudes Questionnaire [17] that included three subscales: Fear of Fat (3 items), Dislike (7 items), and Willpower (3 items). The fear of fat subscale captured individuals' worries and concerns with weight that are self-relevant (e.g., "I worry about becoming fat"). The dislike subscale captured individuals' prejudice against fat people (e.g., "I really don't like fat people much"). The willpower subscale captured individuals' beliefs about the controllability of weight and fat ("Some people are fat because they have no willpower"). The items were rated on a scale from 1 (Very Strongly Disagree) to 10 (Very Strongly Agree). Items corresponding to each subscale were averaged to form a composite, with higher scores indicating higher levels of anti-fat attitudes. The reliability coefficients for both mothers' and daughters' weight attitudes scores were satisfactory, with Cronbach's alphas ranging from 0.75 and 0.89.

Dietary restraint

To measure dietary restraint, mothers and daughters completed the dietary restraint subscale (10 items) from the Dutch Eating Behavior Questionnaire [38]. These questions asked how often they engaged in behaviors that restrict food intake deliberately due to weight concerns (e.g., "How often do you refuse food or drink offered because you are concerned about your weight?"). Items were rated on a scale from 1 (Never) to 5 (Very Often). Higher scores represent greater endorsement of dietary restraint behaviors. The reliability coefficients for both mothers' and daughters' dietary restraint variables were satisfactory, with Cronbach's alphas = 0.92.

Analysis plan

Preliminary analyses were first conducted to examine descriptive statistics and correlations for the target variables. Then, the APIM was used to examine the main hypotheses [39]. As depicted in Fig. 1, the APIM estimates the effect of individuals' anti-fat attitudes on their own dietary restraint (actor effect) and on the other member's restrained (partner effect) simultaneously and independently. Furthermore, to examine the joint effect, the interactions between the mother and daughter anti-fat attitudes on dietary restraint were estimated. A total of three APIMs would be conducted to examine whether the actor, partner, and interaction effects of mother-daughters' anti-fat attitudes (i.e., fear of fat, dislike of fat people, and willpower) on dietary restraint. In the APIM models, age and BMI of mothers and their daughter were included as covariates. All predictors were standardized to the grand mean. The interaction terms between the actor-partner anti-fat attitudes scores were computed based on the standardized variables. In order to display a significant interaction, graphical representation was constructed by calculating the simple effects corresponding to one standard deviation above and below the mean for daughters' and

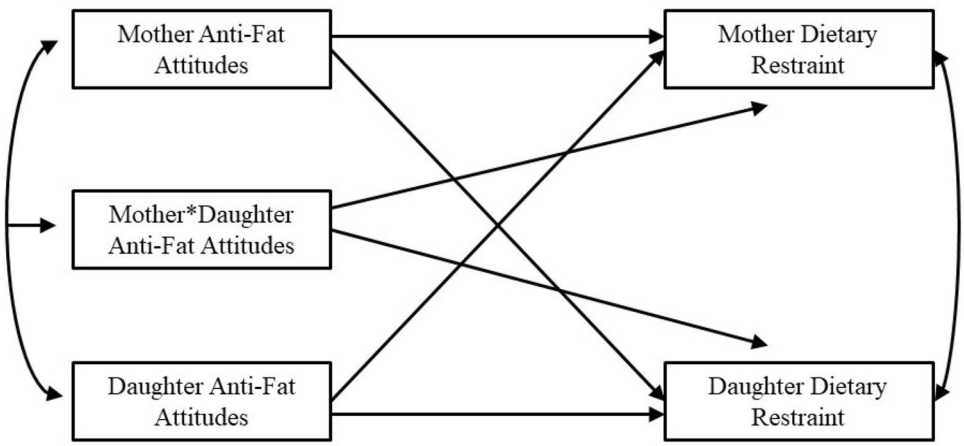

Fig. 1 Graphical representation of the Actor–Partner Interdependence Model. Same model was estimated three times for the three subscales of anti-fat attitudes: fear of fat, dislike, and willpower. Double-headed arrows represent covariances. Although not shown, age and BMI of both members were included as covariates

mothers' anti-fat attitudes on the outcome variables [40]. The APIMs were estimated with structural equation modeling (SEM) implemented by *R*'s [41] lavaan package [42].

Results

Preliminary analyses

We first examined the studied variables with a multivariate normality and a missing completely at random (MCAR) test with the MissMech R package [43]. The Hawkins' index showed that the assumptions of multivariate normality and MCAR were met ($p = 0.52$). Therefore, direct model fitting with Maximum Likelihood estimator was adequate for handling the current data [44], and this approach was adopted for the estimation of descriptive statistics, correlations, and the APIMs. Descriptive statistics and correlations of all variables are presented in Table 1.

Main analyses

For the fear of fat model (see Table 2), actor effects revealed that daughters' and mothers' who reported higher fear of fat were themselves engaged in more dietary restraint. Partner effect also showed that mothers with higher fear of fat had daughters who engaged in more dietary restraint. In contrast, daughters' fear of fat was not significantly related to mothers' dietary restraint. Findings also showed an interaction effect of mother–daughter fear of fat on daughters' restraint. As shown in Fig. 2, adolescent girls with higher fear of fat engaged in more dietary restraint, and this association stronger for those with mothers who were higher in fear of fat ($b = 0.738$, SE = 0.096, $p < 0.01$), compared to low fear of fat mothers ($b = 0.370$, SE = 0.089, $p < 0.01$). The interaction effect of mother-daughter fear of fat on mothers' dietary restraint was not significant.

For the dislike model (see Table 3), actor effect showed that daughters with more prejudice against fat people also engaged in more dietary restraint. The actor effect between dislike and dietary restraint, however, was not significant for mothers. Interestingly, partner effect showed that daughters who reported more prejudice against fat people had mothers who engaged in more dietary restraint. The partner effect between mothers' dislike on daughters' dietary restraint was not significant. The interaction effects of mother–daughter dislike on both mothers' and daughters' dietary restraint were not significant.

For the willpower model (see Table 4), actor effect showed that mothers who reported higher scores on willpower engaged in more dietary restraint themselves. However, the association between daughters' scores on willpower and dietary restraint was not significant. None of the partner

Table 1 Means, standard deviations, and correlations

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Daughters' age (in years)	14.15	2.75	–	0.28*	− 0.02	0.02	0.39**	− 0.14	0.28*	0.00	0.05	0.10	0.03	0.12
2. Mothers' age (in years)	44.03	7.23		–	0.03	− 0.29*	0.24*	− 0.1	0.20	0.09	0.13	0.13	− 0.10	0.13
3. Daughters' BMI percentile	63.87	27.56			–	0.30*	0.31*	− 0.12	0.18	− 0.02	− 0.05	0.02	0.05	0.13
4. Mothers' BMI	30.24	7.56				–	0.03	− 0.10	0.13	− 0.02	0.04	− 0.19	0.13	− 0.20*
5. Daughters' dietary restraint	2.18	0.90					–	0.10	0.67**	0.20*	0.14	0.08	0.09	0.14
6. Daughters' dislike	2.47	1.54						–	0.32*	0.46**	0.32*	0.02	0.13	0.06
7. Daughters' fear of fat	4.63	3.19							–	0.32*	0.17	− 0.02	0.02	0.11
8. Daughters' willpower	4.55	2.32								–	0.17	0.08	0.06	0.23*
9. Mothers' dietary restraint	2.58	0.83									–	0.12	0.31*	0.25*
10. Mothers' dislike	2.03	1.3										–	0.34**	0.42**
11. Mothers' fear of fat	5.21	2.77											–	0.40**
12. Mothers' willpower	5.74	2.38												–

M and SD are used to represent mean and standard deviation, respectively. All coefficients and tests were conducted with Maximum Likelihood estimator

*$p < 0.05$

Table 2 APIM associations between fear of fat and dietary restraint

	D-dietary restraint			M-dietary restraint		
	b	SE	*B*	*b*	SE	*B*
Intercept	2.237			2.556		
D-age	0.265*	0.075	0.254	0.039	0.105	0.040
M-age	− 0.054	0.074	− 0.059	0.076	0.104	0.089
D-BMI percentile	0.188*	0.064	0.205	− 0.082	0.090	− 0.096
M-BMI	− 0.120	0.067	− 0.136	− 0.009	0.093	− 0.011
D-fear of fat	0.554*	0.066	0.612	0.083	0.092	0.099
M-fear of fat	0.126*	0.061	0.138	0.270*	0.085	0.319
D-fear*M-fear	0.184*	0.065	0.201	0.150	0.090	0.177
R^2	0.638			0.156		

D daughter-report variables, *M* mother-report variables, *b* unstandardized coefficients, *SE* standard errors, *B* standardized coefficients

*$p < 0.05$

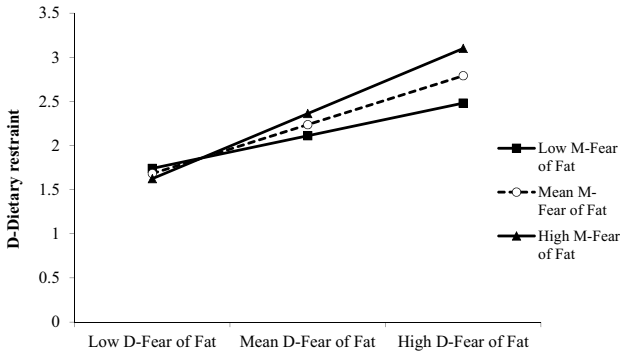

Fig. 2 The interaction effect between mothers' and daughters' fear of fat on daughters' dietary restraint. *D* daughter-report variables, *M* mother-report variables

effects, nor the mother-daughter interaction effects, were found significant.

Discussion

Consistent with past research [7, 19], the current study showed significant individual-level relationships between fear of fat and dietary restraint (i.e., actor effect). While research has highlighted the important role of parent body attitudes in adolescent eating behavior [45, 46], we extended prior research findings using a dyadic design to demonstrate that mothers' fear of fat was related to daughters' dietary restraint, which accounted for daughter's own fear of fat. Mothers' and daughters' fear of fat also interacted to predict adolescent girls' eating behavior, such that daughters' dietary restrain was highest when both she and her mother reported high fear of fat. The construct of fear of fat is an internally focused, future oriented construct [17]. Unlike the

Table 3 APIM associations between dislike and dietary restraint

	D-dietary restraint			M-dietary restraint		
	b	SE	*B*	*b*	SE	*B*
Intercept	2.216			2.549		
D-age	0.415*	0.098	0.398	0.060	0.103	0.062
M-age	0.110	0.096	0.120	0.107	0.101	0.127
D-BMI percentile	0.299*	0.086	0.326	− 0.034	0.091	− 0.040
M-BMI	− 0.028	0.091	− 0.032	0.069	0.096	0.084
D-dislike	0.202*	0.085	0.214	0.257*	0.090	0.294
M-dislike	− 0.012	0.078	− 0.013	0.108	0.082	0.137
D-dislike*M-dislike	0.073	0.096	0.072	0.046	0.101	0.049
R^2	0.33			0.13		

D daughter-report variables, *M* mother-report variables, *b* unstandardized coefficients, *SE* standard errors, *B* standardized coefficients

*$p < 0.05$

Table 4 APIM associations between willpower and dietary restraint

	D-dietary restraint			M-dietary restraint		
	b	SE	*B*	*b*	SE	*B*
Intercept	2.228			2.562		
D-age	0.370*	0.098	0.355	− 0.009	0.104	− 0.010
M-age	0.119	0.095	0.130	0.126	0.100	0.148
D-BMI percentile	0.275*	0.089	0.300	− 0.107	0.093	− 0.126
M-BMI	− 0.042	0.093	− 0.048	0.086	0.098	0.105
D-willpower	0.139	0.086	0.154	0.061	0.091	0.074
M-willpower	0.017	0.085	0.019	0.228*	0.089	0.280
D-willpower*M-willpower	− 0.089	0.088	− 0.095	− 0.070	0.093	− 0.081
R^2	0.323			0.122		

D daughter-report variables, *M* mother-report variables, *b* unstandardized coefficients, *SE* standard errors, *B* standardized coefficients

*$p < 0.05$

present-oriented construct of drive for thinness, fear of fat pulls for preoccupation with an uncertain outcome. As such, this anxiety in a mother may "spill over" to her daughter and promote dietary restraint, particularly if the adolescent is already prone to her own anxiety.

While fear of fat represents an internally-focused and future oriented construct, dislike and willpower reflect opinions about the behavior and appearance of others. Regarding dislike of fat, daughters' prejudice against individuals of a heavy weight status was a significant predictor of their own dietary restraint, but mothers' dislike and mothers' dietary restraint was not significant. However, daughters' dislike was related to dietary restraint in their mothers. This potential partner effect is surprising, given the fact that mother's own dislike did not predict her own eating behavior. While dietary restraint was conceptualized as an outcome variable within this study, data was collected concurrently. As such, it is possible that maternal dietary restraint precedes daughter anti-fat attitudes. From this perspective, the behavioral modeling of mothers who engage in dietary restraint may contribute to more dislike of fat for their daughters. Indeed, past research supports the idea that parental dietary patterns impact the eating and body attitudes of their children [10, 13, 47].

Regarding willpower, significant actor effects were found for mothers, but not daughters. Mothers who believe that weight is controllable engaged in higher rates of dietary restraint; however, this belief did not impact their daughters. This discrepancy could be partially due to the fact that mothers may actually have greater control over their weight and weight management strategies (buying groceries, cooking/planning meals, etc.) as compared to their adolescent daughters. No partner or interaction effects were found for willpower and dietary restraint; willpower beliefs may be communicated less frequently within the family than weight-related prejudice or personal fear.

These findings suggest that anti-fat attitudes are related to individual and dyadic eating behavior; however, the impact varies depending on the specific attitude studied. Within the current study, fear of fat emerged as the most salient predictor of dyadic dietary restraint among mothers and daughters. These findings have important implications for clinicians working with parents and families. For mothers, managing their own anxiety around weight gain may contribute to more healthful attitudes and behavior around food among their daughters. Like parent-focused treatment for clinical eating disorders (e.g., [48]), intervention around fear of fat with mothers may be an opportunity to "get more bang for your buck" by changing the family culture, potentially impacting subclinical eating patterns for both mothers and daughters within the home. Future research should continue to address complex dyadic role of fear of fat and weight bias within mother-daughter relationships.

Limitations

The current study utilized a dyadic design to examine complex relationships between anti-fat attitudes and dietary restraint; however, the data is cross-sectional, which limits the ability to draw causal inferences. Although dietary restraint was conceptualized as the outcome variable (predicted by anti-fat attitudes), it is feasible that dietary restraint could precede anti-fat attitudes, at least in some cases or across partners. Willpower represents a domain most obviously at risk for this pattern; such that one's belief in the ability to control weight may be influenced by their own success or failure in maintaining weight with weight management strategies like dietary restraint. Future research should consider longitudinal study designs in order to better explain the relationship between these variables. Additionally, the cross-sectional data makes it impossible to predict the timing of cross-dyad influences. Researchers commonly

assume unidirectional parent influence on child; however, it is unlikely that this is true in all cases.

A second limitation is the small sample size and homogeneity of participants, limiting the generalizability of findings. Specifically, the reported findings may lack relevance outside of a Midwestern, predominantly White and African American sample. Both anti-fat attitudes [49] and dietary restraint behavior [50] are known to vary across cultures and subcultures, and further research should continue to investigate the relationships between these variables among families of differing racial/ethnic groups and cultural traditions. Additionally, the current study was limited to mother-daughter dyads. While this choice was intentional, due to the relevance of disordered-eating for adolescent females [1, 2] and the past research support of maternal influence on their daughter's eating behavior [10, 13], doing so limits the generalizability of findings to other parent–child relationships. Future research should consider investigating similar relationships among mother–son, father–daughter, and father–son relationships as well.

Finally, the current study is based on self-report data and thus, the results are susceptible to reporter biases. For instance, the association between fear of fat and dietary restraint could be underlined by broader psychopathology (e.g., depressive affect). Furthermore, the self-report nature of this study is susceptible to the social desirability effect. While weight bias remains somewhat more socially acceptable than other prejudices [17, 20], people may be unwilling to share their negative views about fatness due to their awareness that doing so is not socially desirable [51], as observed in other studies of anti-fat attitudes [30]. Nevertheless, the dyadic design of this study including both mothers' and daughters' reports, especially with the existence of partner effects, helped in addressing issues pertaining to self-report data.

Conclusion

This study investigated the interactive role of anti-fat attitudes in predicting dietary restraint within the mother–daughter relationship. The findings indicated that one's own fear of fat was related to their dietary restraint and that a mother's fear of fat is related to her daughter's dietary restraint. Further, mothers' and daughters' fear of fat interacted to predict the daughter's dietary restraint, suggesting that mother anxiety may "spill over" and impact daughter behavior. Dislike was also related to individual restraint, as was willpower (for mothers' only); however, mothers' and daughters' attitudes did not interact in these domains. These findings can be useful in identifying at risk mother–daughter dyads and in developing parent-focused interventions for subclinical eating symptoms such as providing support to parents in creating a healthy environment for body image and eating for their children.

What is already known on this subject?

Individual-level relationships exist between anti-fat attitudes and dietary restraint. Further, for those in close relationships, individual characteristics can impact their partner.

What does this study add?

Mothers' and daughters' fear of fat interact to predict daughters' dietary restraint. Mothers' anxiety management around weight may contribute to more healthful attitudes/behavior for daughters.

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Compliance with ethical standards

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of Eastern Michigan University Human Subjects Review Committee.

Informed consent Informed consent was obtained from mothers for themselves and their adolescent daughters; daughters under 18 provided assent to participate.

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