Appetite 199 (2024) 107403

Contents lists available at ScienceDirect

Appetite

journal homepage: www.elsevier.com/locate/appet

Motivation to regulate eating behaviors, intuitive eating, and well-being: A dyadic study with mothers and adult daughters

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ARTICLE INFO

Keywords:
Intuitive eating
autonomous and controlled motivation
Well-being
Mother-daughter dyads

ABSTRACT

Intuitive eating, defined as relying on physiological cues to determine when, what, and how much to eat while maintaining a positive relationship with food (Tribole & Resch, 1995), has gained a lot of research attention in the last two decades. The present study sought to determine how motivation for regulating eating behaviors is related to intuitive eating and well-being outcomes in dyads of mothers and their adult daughters (n = 214). Structural equation modelling revealed that controlling for dieting and desire to lose weight, both mothers' and daughters' autonomous motivation was positively associated with their own intuitive eating while their controlled motivation was negatively associated with intuitive eating. In turn, intuitive eating was positively associated with well-being in both mothers and daughters. Interestingly, mothers' intuitive eating was also positively related to their daughters' well-being. The analysis of indirect effects suggests that mothers' motivation to regulate eating behaviors has an indirect (mediating) relationship with daughters' well-being through mothers' intuitive eating. The implications for women's health and well-being are discussed.

1. Introduction

Intuitive eating has attracted popular and scientific attention as an adaptive style of eating and a healthy alternative to food restriction and dieting. Intuitive eating is defined as relying on physiological cues to determine when, what, and how much to eat while maintaining a positive relationship with food (Tribole & Resch, 1995). Intuitive eating involves eating behaviors based on hunger and satiety signals that assume the body instinctively knows what it needs to thrive (Hazzard et al., 2020). Importantly, intuitive eating has been associated with positive eating behaviors and greater well-being (e.g., Bruce & Ricciardelli, 2016; Eck & Byrd-Bredbenner, 2020; Hazzard, et al., 2020; Schaefer & Magnuson, 2014; Tylka et al., 2015).

Personal regulation of healthy eating such as food choices and nutritional knowledge are important determinants of healthy eating, but research suggests that environmental factors such as family relationships are also influential (Raine, 2005). The interpersonal environment created by family provides an important context for children's food choices, as family provides the first and immediate social environment in which children learn and practise dietary patterns (Raine, 2005). The present study focuses specifically on one type of relationship, the mother-daughter dyad, and aims at understanding the motivational and interpersonal dynamics that influence both members' regulation of eating behaviors. We investigate here whether different forms of motivation to regulate eating behaviors are associated with intuitive eating and well-being in mothers and daughters.

1.1. Autonomous and controlled regulation of eating behaviors

Self-Determination Theory (SDT; Ryan, 2023) is a theory of motivation that proposes that the regulation of eating behaviors can stem from different underlying reasons which predict important outcomes such as healthy eating habits (Guertin et al., 2017; Leong et al., 2012). Individuals who have a controlled regulation of eating behaviors will feel internal and/or external pressures to eat a certain way. Perhaps they feel pressure from society or people around them to eat a certain way (*external regulation*), feel compelled by internal pressures to avoid feelings of guilt and shame (*introjected motivation),* or feel unsure as to why

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https://doi.org/10.1016/j.appet.2024.107403
Received 24 January 2024; Received in revised form 12 April 2024; Accepted 6 May 2024
Available online 7 May 2024

they are engaging in the behavior in the first place (*amotivation*). Conversely, individuals who have an autonomous regulation of eating behaviors will choose to eat a certain way because it is enjoyable or interesting (*intrinsic motivation*), in line with their values and identity (*integrated motivation*) or perceived as important and congruent with personal choices and goals (*identified motivation*).

Numerous studies have shown the positive impact of an autonomous regulation in diverse domains such as education (e.g., Jang et al., 2012), health (e.g., Gillison et al., 2019), and physical activity (e.g., Van den Berghe et al., 2014). Other studies have documented the negative effects of controlled motivation in behavior regulation over time, such as increased symptoms of depression (Holding et al., 2017) and chronic biological stress (Holding et al., 2021).

Pelletier et al. (2004) published the first research specifically focusing on autonomous and controlled regulations of eating behaviors. In three studies, the authors examined how autonomous and controlled forms of motivation for the regulation of eating behaviors were related to self-reported eating behaviors and dietary behavior change. A motivational model of the regulation of eating behaviors suggested that an autonomous regulation was positively associated with healthy eating behaviors whereas a controlled regulation was positively associated with dysfunctional eating behaviors and negatively associated with healthy eating behaviors. Moreover, long-term adherence to healthier dietary behaviors in a population at risk for coronary artery disease was examined over a 26-week period. Autonomous motivation for regulating eating behaviors emerged as a significant predictor of long-term adherence to healthier dietary behaviors, evidenced by improvements in total dietary fat and saturated fat intake, as well as objective parameters of health including weight and blood lipid.

Since then, research consistently finds the association between autonomous regulation of eating behaviors and positive outcomes as well as between controlled regulation of eating behaviors and negative outcomes (e.g., Eisenberg et al., 2016; Verstuyf et al., 2016). Importantly, a recent study by Guertin and Pelletier (2022) shows that autonomous motivation to regulate eating behaviors is related to concern about the *quality* of food while controlled motivation is related to concern about the *quantity* of food. In two studies the authors found that autonomous motivation was positively associated with planning and self-monitoring eating *quality*, and these strategies were then positively and negatively associated with healthy and unhealthy eating, respectively. In contrast, controlled motivation was positively associated with planning and self-monitoring eating *quantity,* and these strategies were then positively associated with bulimic symptoms. An autonomous regulation, versus a controlled regulation, has also been found to longitudinally improve the eating habits and physical health of patients with cardiovascular diseases (Guertin et al., 2015, 2017).

1.2. Intuitive eating and well-being

Intuitive eating is characterized by eating based on physiological hunger and satiety cues rather than situational and emotional cues and is positively associated with psychological well-being (Tylka, 2006). Four central features of intuitive eating include permission to eat when hungry, eating for physical rather than emotional reasons, reliance on internal hunger/satiety cues to determine when and how much to eat, and body-food choice congruence (Tylka, 2006; Tylka & Kroon Van Diest, 2013).

Intuitive eating has been associated with indicators of physical and psychological health. Individuals who report low levels of intuitive eating appear to display several poor health-related behaviors such as food addiction, dietary restraint, emotional eating and compensatory weight control behaviors. In addition, intuitive eating intervention programs have been shown to significantly improve cholesterol levels and systolic blood pressure (Bacon et al., 2005). Research shows that intuitive eating is also associated with various indicators of psychological health. For example, intuitive eating is positively associated with self-esteem, optimism, and general well-being (Tylka, 2006; Tylka et al., 2013, 2015) and negatively related to anxiety (Iannantuono & Tylka, 2012).

Recently, researchers have sought to uncover the social and motivational antecedents of intuitive eating. Recent evidence shows that women who are autonomously motivated toward physical activity also eat more intuitively (Gast et al., 2015), suggesting that feeling authentic and choiceful about one's lifestyle in one domain may be accompanied with a more intuitive approach in other lifestyle domains. Importantly, Carbonneau et al. (2015) examined how mothers' and partners' interpersonal styles would be conducive to intuitive eating by influencing motivation for regulating eating behaviors. Controlling for body mass index (BMI), these researchers found that perceived autonomy support (i.e., a caring, empathic interpersonal style) promoted intuitive eating via enhancing autonomous motivation to regulate eating behaviors. Meanwhile, more controlling interpersonal styles from mothers and partners resulted in less intuitive eating via greater controlled motivation for eating.

1.2.1. The mother/daughter dyad

Food-related behaviors and cognitions are greatly influenced by our environment. Family dynamics and the mother-daughter relationship have been shown to have a great influence on daughters' body image and food-related behaviors (e.g., Benninghoven et al., 2007). Mothers have a direct impact on their daughter's body image and body esteem through their conversations about food and dieting (e.g., Cooley et al., 2008; Neumark-Sztainer et al., 2010). They also have an indirect impact through their modeling of food-related behaviors (Berge et al., 2013). Longitudinal studies have found that mothers who are preoccupied with their own weight have adolescent daughters who are more likely to display weight-controlling behaviors up to five years later (van den Berg et al., 2010). Furthermore, a recent study found that mothers displaying sub-clinical levels of an eating disorder had daughters who were preoccupied with their body size and shape, thus suggesting a mother-daughter modeling effect (Lewis et al., 2015).

A recent experimental study investigating the emotive response to food of mothers and their young adolescent daughters found patterns of similar emotional responses to different types of foods within the dyads (Lewis et al., 2015). However, they reported no significant correlations between mothers' and daughters' weight and shape concern. Similarly, Ogden and Steward (2000) reported no correlation between mothers' restrained eating behaviors and body dissatisfaction and that of their daughters while Usmiani and Daniluk (1997) found a positive moderate correlation between mothers' and daughters' body image. Thus, the literature points to some inconsistencies regarding the similarities between mothers and their daughters with regards to food-related behaviors and body-related attitudes.

To our best knowledge, no prior work has investigated the similarities and differences within mother-daughter dyads in terms of the motivational dynamics proposed by SDT and intuitive eating. One previous study has suggested a moderate positive correlation between autonomous motivation for consuming fruits and vegetables within a parent-child dyad (Dwyer et al., 2017), but it remains unclear whether a mother with autonomous eating motivation is likely to have a daughter with similar motivation.

1.3. The present study

Given the previously reviewed literature we sought to determine the levels of motivation, intuitive eating, and well-being within mother-daughter dyads. Based on past research regarding the associations between mothers' and their daughters' food regulation and body image (e.g., Lewis et al., 2015) we expected a moderate degree of similarity within the dyads.

Second, we aimed to determine the associations between these variables. Based on the previously reviewed literature (e.g., Carbonneau

et al., 2015), we expected that autonomous motivation would be positively associated with intuitive eating and well-being while controlled motivation would be negatively associated with these two variables in both mothers and daughters. We also expected intuitive eating would be positively associated with well-being (e.g., Tylka, 2006). Mothers' and daughters' dieting and desire to lose weight were treated as a control variable in the analysis to account for the effect these variables may have on motivation, intuitive eating, and well-being.

Third, an exploratory objective was to test partner effects of intuitive eating on well-being over and above actor effects. We wanted to test the possibility that being around a close other who displayed a positive relationship with food might boost one's well-being, over and above the effect of one's own intuitive eating. We thus modeled paths from mothers' and daughters' intuitive eating to each other's well-being. A final objective was to examine the extent to which intuitive eating mediated the associations between autonomous/controlled motivation and well-being.

2. Method

2.1. Participants and procedure

Participants were 214 dyads of mothers and their daughters from the province of Quebec, Canada (total n = 428). Participants were recruited by a professional survey firm. The mean age for the daughters was 28.96 (SD = 6.76) and 57.25 (SD = 8.16) for the mothers. Most dyads (72.9%) were not living together at the time of the study. Participants were part of a larger cross-sectional study on the social factors that influence women's attitudes and behaviors related to eating and body image (see also Carbonneau et al., 2020; Gagnon-Girouard et al., 2020; Roberts et al., 2020). The complete list of measures can be found at OSF (https://osf.io/avxh3/?view_only=1913fa8540c8477a934d18c74e6baa28). Data was collected between May and November 2018. Individuals interested in participating in the study were directed to an online survey website that contained the questionnaires in French. Participants signed a consent form electronically before starting the survey. Upon completion of the questionnaire, participants were entered into a prize drawing. Ethical approval for this study was granted by the Research Ethics Committee of the Université du Québec in Trois-Rivières (#CER-14-203-07.30).

2.2. Measures

Demographic variables. Participants completed a demographic information section that included questions on age, education, ethnic background, status of cohabitation, etc. See Table 2 for a list of all demographic variables as well as the descriptive information.

Autonomous and controlled motivation to regulate eating behaviors. Both mothers and daughters completed the 24-item contextual motivation scale specific to eating regulation (Pelletier et al., 2004). Each item assesses a potential reason why participants are regulating their eating behaviors ("Why are you regulating your eating behaviors?"). A total of four items assesses each type or regulation: Intrinsic motivation (e.g., I take pleasure in fixing healthy meal, mothers' Cronbach's α = 0.88; daughters' Cronbach's α = 0.90), integrated regulation (e.g., Eating healthy is part of the way I have chosen to live my life, mothers' Cronbach's α = 0.90; daughters' Cronbach's α = 0.85), identified regulation (e.g., I believe it will eventually allow me to feel better, mothers' Cronbach's α = 0.78; daughters' Cronbach's α = 0.78), introjected regulation (e.g., I feel I must absolutely be thin, mothers' Cronbach's α = 0.84; daughters' Cronbach's α = 0.84), external regulation (e.g., Other people close to me insist that I do, mothers' Cronbach's α = 0.78; daughters' Cronbach's α = 0.81), and finally amotivation (e.g., I don't really know. I truly have the impression that I'm wasting my time, mothers' Cronbach's α = 0.78; daughters' Cronbach's α = 0.81). Participants rated each item using a 7-point Likert scale ranging from 1 (does not correspond to me at all) to 7 (very strongly corresponds to me). As described by Pelletier et al. (2004), a global score of autonomous eating regulation was computed by grouping the intrinsic motivation, integrated regulation and identified regulation, and a controlled eating regulation score was computed by grouping the introjected and external regulation subscales.

Intuitive eating. Both mothers and daughters completed the 23-item intuitive eating scale (Tylka & Kroon Van Diest, 2013) adapted and validated for a French-Canadian population (Carbonneau et al., 2016). A sample item is "I trust my body to tell me when to eat." Items were rated on a 5-point Likert scale ranging from 1 (Completely disagree) to 5 (Completely agree). In the present study, the Cronbach alpha was 0.91 for mothers and 0.90 for daughters.

Well-being. Both mothers and daughters completed the five-item Satisfaction With Life Scale (SWLS; Diener et al., 1985), and a nine-item scale of affect (Emmons, 1992) that includes four positive (e.g., joyful) and five negative (e.g., frustrated) emotions. All items were rated on a scale from 1 (Strongly disagree) to 7 (Strongly agree). Well-being was calculated as the mean across the measures (after reversing the negative affect score) as was done in previous research (e.g. Koestner et al., 2012). Each of the scales was internally reliable, all alphas >0.82.

Weight-related variables. Mothers and daughters were asked whether they were currently dieting to lose weight (yes/no) and whether they had been dieting in the last two years (yes/no). Participants who answered "yes" to at least one of those questions were classified as dieters (31.8% of mothers; 31.3% of daughters) and the others were considered non-dieters (68.2% of mothers; 68.7% of daughters) (Provencher et al., 2004).

Participants were also asked whether they wished to modify their weight using the following scale: I would like to (1) lose a lot of weight, (2) lose a little weight, (3) maintain my weight, (4) gain a little weight, (5) gain a lot of weight. To facilitate interpretation, the variable was reverse so that higher values indicate greater desire to lose weight. Most mothers (68.7%) and daughters (65.9%) reported that they would like to lose either a little or a lot of weight.

3. Statistical analyses

Means and standard deviations (see Table 1), descriptive demographic information (Table 2), as well as correlations between the model variables (see Table 3) were obtained using SPSS software (version 25). Intraclass correlation coefficients (ICC; Kashy & Kenny, 2000) were computed for each dyad to examine the degree of resemblance of autonomous motivation, controlled motivation, intuitive eating, and well-being among dyad members. An ICC of zero would indicate that members of the same dyad are no more similar to one another on a given characteristic than are two members of different

Table 1
Means and standard deviations for study variables.

Variables	*M*	*SD*
Mother's dieting	0.32	0.47
Mother's desire to lose weight	3.84	0.71
Mother's autonomous motivation	5.44	1.06
Mother's controlled motivation	2.23	1.07
Mother's intuitive eating	3.61	0.61
Mother's well-being	5.37	1.01
Daughter's dieting	0.31	0.46
Daughter's desire to lose weight	3.72	0.73
Daughter's autonomous motivation	5.28	1.17
Daughter's controlled motivation	2.51	1.13
Daughter's intuitive eating	3.59	0.61
Daughter's well-being	5.13	0.91

Note. Means and standard deviations come from 7-point Likert-type scales for motivation and well-being, and from a 5-point Likert-type scale for intuitive eating and desire to lose weight. The dieting variable is coded 0 = non-dieter and 1 = dieter.

Table 2
Sociodemographic characteristics of study participants (n = 428).

Characteristics of the participants	Mothers (n = 214)		Daughters (n = 214)	
Mean age, years (SD)	57.47 (7.67)		28.96 (6.76)	
(range)	(35–79)		(18–40)	
	N	**%**	**N**	**%**
Ethnicity				
White	211	98.60	202	94.39
Black	0	0.00	1	0.47
Arab	1	0.47	2	0.93
Latin/Hispanic	0	0.00	1	0.47
Multiracial	0	0.00	4	1.88
Indigenous	0	0.00	2	0.93
Other/Unspecified	2	0.93	2	0.93
Annual household income (CAN $)				
< $15,000	7	3.27	33	15.43
$15,000 - $29,999	18	8.41	24	11.22
$30,000 - $44,999	25	11.68	26	12.15
$45,000 - $59,999	34	15.89	22	10.28
$60,000 - $74,999	18	8.41	13	6.07
$75,000 - $89,999	32	14.95	19	8.88
$90,000 - $119,999	42	19.63	32	14.95
$120,000 - $149,999	19	8.88	22	10.28
$150,000 - $199,999	8	3.74	10	4.67
$200,000 or more	6	2.80	11	5.14
Unspecified	5	2.34	2	0.93
Highest level of education completed				
Elementary school	3	1.40	3	1.40
High school	40	18.69	32	14.95
Secondary school vocational diploma (DEP)	22	10.28	15	7.01
College[a]	54	25.23	56	26.17
University - Certificate	5	2.34	5	2.34
University - Bachelor's degree	55	25.70	64	29.91
University - Master's degree	17	7.94	27	12.62
University - Doctorate degree	5	2.34	5	2.34
Other/Unspecified	13	6.08	7	3.26
Occupational status				
Full-time workers	80	37.38	114	53.27
Part-time workers	21	9.81	15	7.01
Students only	2	0.93	18	8.41
Students with a job	1	0.47	38	17.76
On maternity leave	0	0.00	8	3.74
On sick leave	5	2.34	2	0.93
Stay at home	9	4.21	7	3.27
Retired	78	36.45	0	0.00
Other/Unspecified	18	8.41	12	5.61
Relationship status				
Currently involved in a romantic relationship	165	77.10	141	65.89
Married	106	49.53	25	11.68
Cohabiting	159	74.30	114	53.27
Maternal tongue				
French	209	97.67	208	97.20
English	3	1.40	4	1.87
Other/Unspecified	2	0.93	2	0.93
Number of kids				
None	0	0.00	143	66.82
One	45	21.03	27	12.62
Two	94	43.93	30	14.02
Three	53	24.77	10	4.67
Four	17	7.94	4	1.87
Five or more	5	2.33	0	0.00
Currently living with their mother?				
Yes			58	27.10
No			156	72.90
If no, since …				
Less than one year			7	4.49
One year			6	3.85
Two years			8	5.13
Three years			6	3.85
Four years			9	5.77
Five years or more			114	73.08
Unspecified			6	3.85
Living arrangement during daughter's childhood				
With both parents			158	73.83
Shared custody			20	9.35
With the mother only			20	9.35
With the father only			2	0.93
With the mother and her common-law partner			9	4.20
Other/Unspecified			5	2.34

dyads. The structural equation modeling analyses were performed using Amos 25 (Arbuckle, 2016). The models were also run in EQS version 6.2 (Bentler, 1989) to obtain additional fit statistics. Adjustment between predicted and observed data was investigated using the following fit indices: Normed Fit Index (NFI), Non-Normed Fit Index (NNFI), Goodness of Fit Index (GFI), Comparative Fit Index (CFI), Standardized Root Mean Square (SRMR), and Root Mean Square Error of Approximation (RMSEA). The cut-off values for those fit indices were NFI >0.90, NNFI >0.90, GFI >0.90, CFI >0.93, SRMR <0.10 and RMSEA <0.05 (Hair, Anderson, Tatham, & Black, 1992).

The hypothesized model (see Fig. 1) included eight exogenous variables (i.e., mothers' and daughters' dieting, desire to lose weight, autonomous motivation, and controlled motivation) and four endogenous variables (i.e., mothers' and daughters' intuitive eating and well-being).

Bias-corrected bootstrapped 95% confidence interval (CI) estimates of indirect effects (see Preacher & Hayes, 2008) were also conducted to test whether intuitive eating mediates the association between motivation and well-being. Bootstrapping is a resampling technique that creates resamples of the same size as the original sample using sampling with replacement. This process is repeated several times, thus providing sample distributions of indirect effects. As a result, indirect effects can be statistically estimated as well as their 95% confidence intervals. In the present research, the confidence interval was bias corrected given that this correction is believed to improve power and Type 1 error rates (MacKinnon et al., 2004).

4. Results

Intraclass correlation analyses. Examination of intraclass correlations between mothers' and daughters' scores revealed significant correlations for autonomous motivation ($r = 0.299$, $p < 0.001$), controlled motivation ($r = 0.216$, $p < 0.001$), intuitive eating ($r = 0.231$, $p < 0.001$), and well-being ($r = 0.310$, $p < 0.001$), suggesting some degree of concordance within dyads.

Structural equation modeling analyses. The tested model provided an almost satisfactory overall fit to the data. Inspection of the modification indices suggested adding a path from daughter's dieting to mother's well-being. Fit indices for this new model were excellent. The chi-square value was non-significant, χ^2 ($df = 19$, $N = 214$) = 23.42, $p = 0.219$, and other fit indices were adequate: NFI = 0.957, CFI = 0.981, SRMR = 0.031, and RMSEA = 0.033 [0.000; 0.072]. The standardized solution of the final model is presented in Fig. 2.

First, intrapersonal associations were examined for mothers. Dieting ($\beta = -0.328$, $p < 0.001$) and desire to lose weight ($\beta = -0.198$, $p < 0.01$) were both negatively and significantly related to intuitive eating. Mothers' autonomous motivation and controlled motivation were respectively positively ($\beta = 0.182$, $p < 0.01$) and negatively ($\beta = -0.135$, $p < 0.05$) associated with their intuitive eating. In turn, intuitive eating was positively associated with well-being ($\beta = 0.305$, $p < 0.001$). Mothers' autonomous ($\beta = 0.186$, $p < 0.001$) and controlled ($\beta = -0.281$, $p < 0.001$) motivation were also directly associated with their well-being.

Second, intrapersonal associations were examined for daughters. Dieting ($\beta = -0.329$, $p < 0.001$) and desire to lose weight ($\beta = -0.142$, $p < 0.05$) were both negatively and significantly related to intuitive

Table 3
Correlations among the study variables.

	1	2	3	4	5	6	7	8	9	10	11	12
1. Mothers' dieting	1	0.46***	−0.05	0.13	−0.45***	−0.20**	0.25***	0.14*	−0.13	0.05	−0.15*	−0.07
2. Mothers' desire to lose weight		1	−0.20**	0.28***	−0.42***	−0.24***	0.12	0.13	−0.14*	0.02	−0.07	−0.15*
3. Mothers' autonomous motivation			1	−0.02	0.23**	0.25***	0.03	−0.03	0.30***	0.10	0.02	0.07
4. Mothers' controlled motivation				1	−0.25***	−0.36***	−0.06	−0.05	0.03	0.22***	−0.09	−0.17*
5. Mothers' intuitive eating					1	0.43***	−0.16*	−0.07	0.20**	−0.10	0.23***	0.24***
6. Mothers' well-being						1	−0.20**	−0.06	−0.02	−0.13*	0.14*	0.31***
7. Daughters' dieting							1	0.36***	0.02	0.27***	−0.45***	−0.23***
8. Daughters' desire to lose weight								1	−0.12	0.23**	−0.35***	−0.21**
9. Daughters' autonomous motivation									1	0.06	0.31***	0.24***
10. Daughters' controlled motivation										−1	−0.37***	−0.24***
11. Daughters' intuitive eating											1	0.36***
12. Daughters' well-being												1

Note. $n = 214$ mother-daughter dyads. $^{*}p < 0.05$, $^{**}p < 0.01$; $^{***}p < 0.001$.

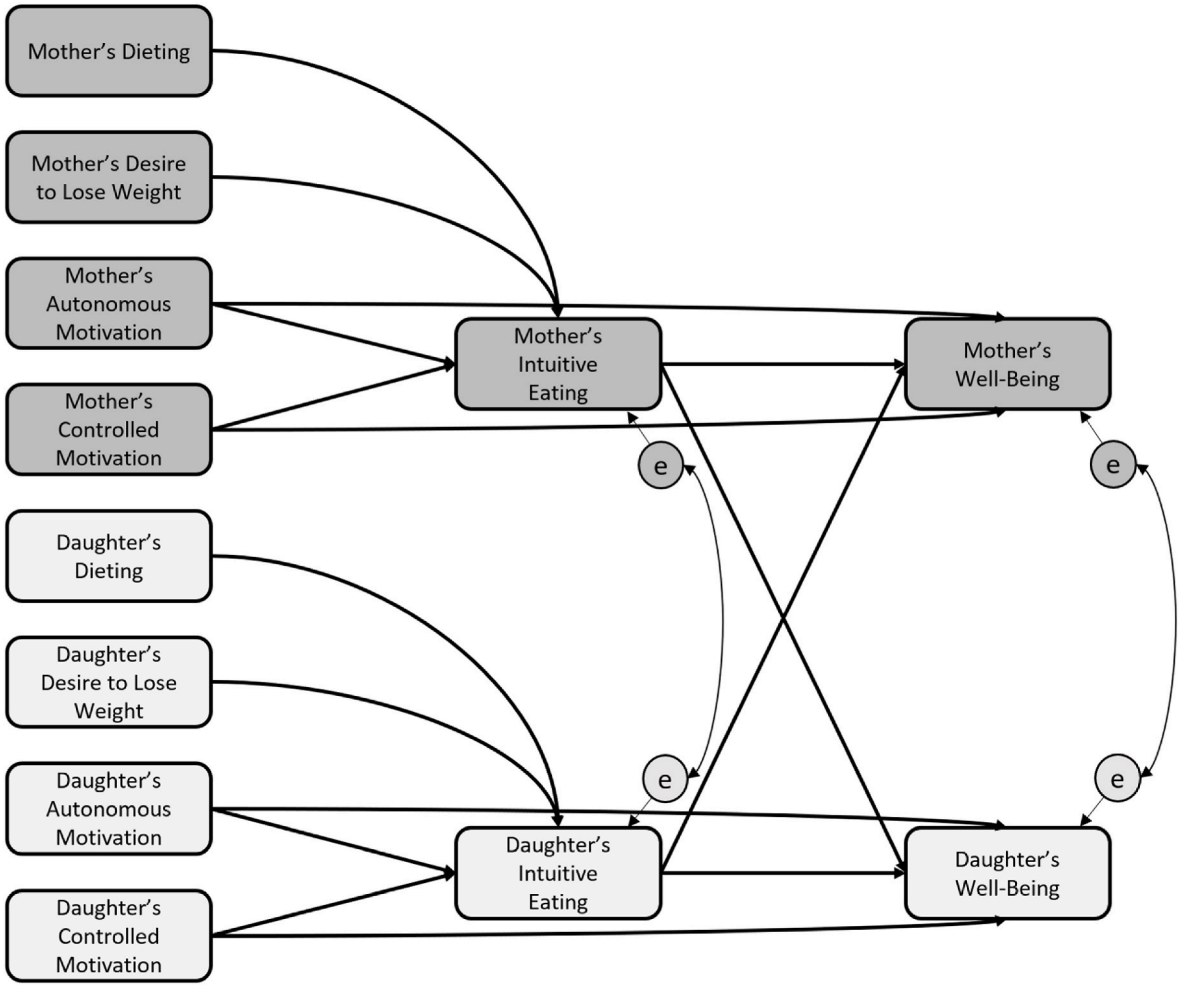

Fig. 1. Hypothesized model
Note. Although not represented on the figure, the eight exogenous variables (on the left) covary.

eating. Daughters' autonomous and controlled motivation were respectively positively ($\beta = 0.305$, $p < 0.001$) and negatively ($\beta = -0.263$ $p < 0.001$) associated with their intuitive eating. In addition, daughters' intuitive eating was positively associated with their well-being ($\beta = 0.222$, $p < 0.01$). Daughters' autonomous ($\beta = 0.187$, $p < 0.01$) and controlled ($\beta = -0.140$, $p < 0.05$) motivation were also directly associated with their well-being.

Third, interpersonal associations were examined. The path from mothers' intuitive eating to their daughters' well-being was found to be significant ($\beta = 0.132$, $p < 0.05$). This path is modest, but was nevertheless obtained over and above the effect of daughter's intuitive eating on their own well-being. The path from daughters' intuitive eating to their mothers' well-being was not found to be significant ($\beta = -0.045$, $p = 0.488$). Interestingly, another partner effect that was not hypothesized emerged: a direct negative path from daughters' dieting to mothers' well-being ($\beta = -0.181$, $p < 0.01$).

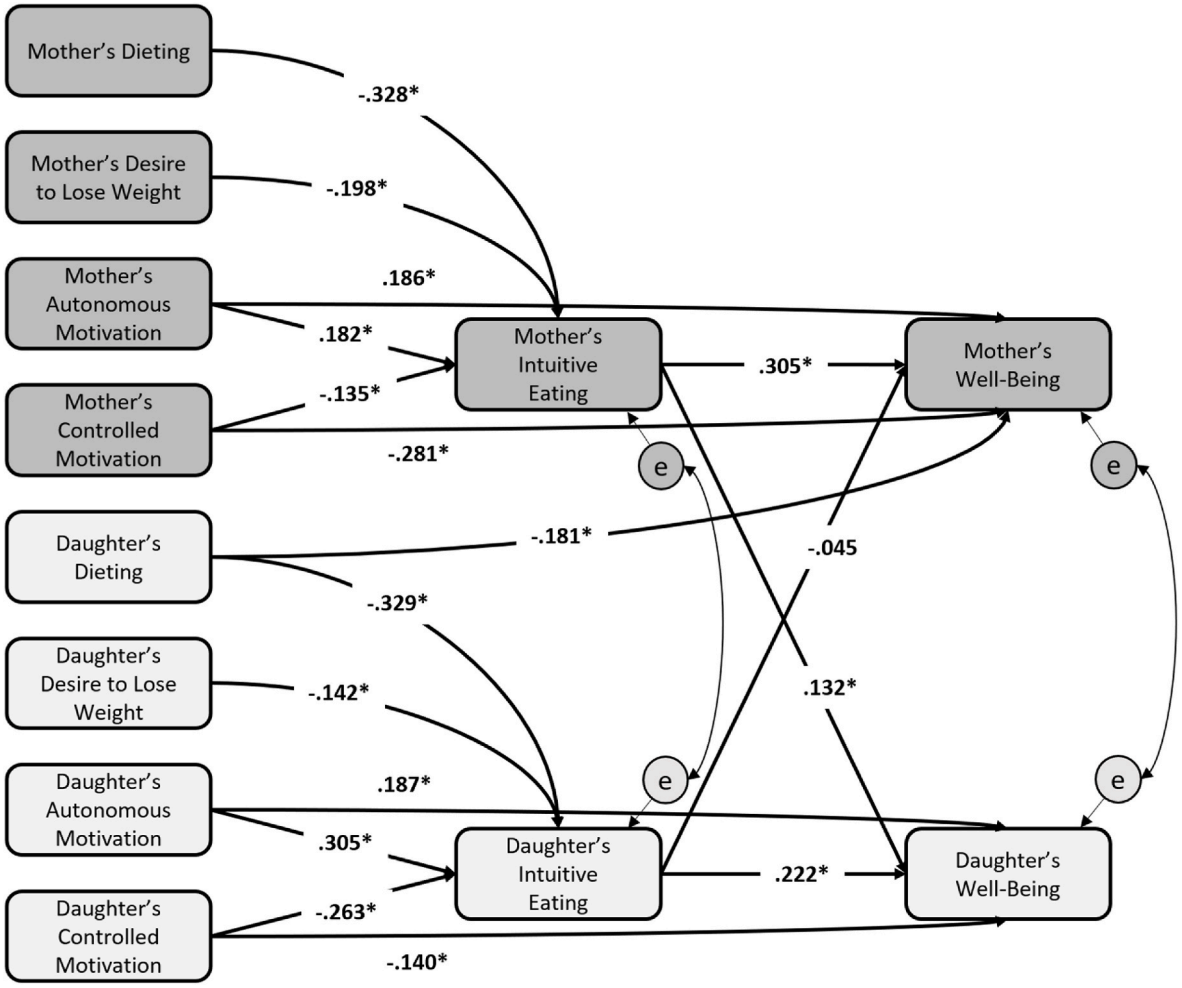

Fig. 2. Results of the Path Analysis with Mothers' and Daughters' Motivation, Intuitive Eating and Well-Being Controlling for Dieting and Desire to Lose Weight
Note. $n = 214$ dyads; *$p < 0.05$. Although not represented on the figure, the eight exogenous variables (on the left) covary. The dieting variable is coded 0 = non-dieter and 1 = dieter.

The squared multiple correlations suggest that the predictors in our model explain 30.6% of the variance in mothers' intuitive eating, 38.4% of the variance in daughters' intuitive eating, 30.0% of the variance in mothers' well-being, and 18.3% of the variance in daughters' well-being.

Indirect Effects. Indirect effects of the proposed model were examined using a 1000 bootstrap samples and bias-corrected bootstrap 95 % confidence interval. First, the indirect effects of mothers' and daughters' motivation on their own well-being (the actor effects), via intuitive eating, were examined. As can be seen in Table 4, the positive indirect effect of mothers' autonomous motivation on their own well-being (standardized bootstrapping point estimate = 0.056, 95% CI [0.014–0.117], $p < 0.01$) as well as the negative indirect effect of their controlled motivation on their own well-being (standardized bootstrapping point estimate = −0.041, 95% CI [-0.087 to −0.010], $p < 0.01$) were both found to be significant. Similarly, the positive indirect effect of daughters' autonomous motivation on their own well-being (standardized bootstrapping point estimate = 0.068, 95% CI [0.029–0.127], $p < 0.01$) as well as the negative indirect effect of their controlled motivation on their own well-being (standardized bootstrapping point estimate = −0.059, 95% CI [-0.119 to −0.024], $p < 0.001$) were both found to be significant.

Second, we examined indirect effects from mother's motivation to their daughters' well-being via mothers' intuitive eating (the partner effects). The indirect effect of mothers' autonomous motivation to their

Table 4
Bias-corrected bootstrapped estimates of the mediations.

	Bootstrapping point estimate	Bias-corrected bootstrapped 95% confidence interval estimates	*p* value
Mother's autonomous motivation → Mother's IE → Mother's WB	0.056	(0.014; 0.117)	0.006
Mother's controlled motivation → Mother's IE → Mother's WB	−041	(-0.087; −0.010)	0.008
Daughter's autonomous motivation → Daughter's IE → Daughter's WB	0.068	(0.029; 0.127)	0.002
Daughter's controlled motivation → Daughter's IE → Daughter's WB	−0.059	(-0.119; −0.024)	0.001
Mother's autonomous motivation → Mother's IE → Daughter's WB	0.024	(0.000; 0.068)	0.054
Mother's controlled motivation → Mother's IE → Daughter's WB	−0.018	(-0.051; 0.000)	0.046

Note. $n = 214$ mother-daughter dyads. IE = intuitive eating; WB = well-being.

daughter's well-being was not found to be significant (standardized bootstrapping point estimate = 0.024, 95% CI [0.000–0.068], p = 0.054). In contrast, the negative indirect effect of mothers' controlled motivation on their daughter's well-being was found to be significant (standardized bootstrapping point estimate = −0.018, 95% CI [-0.051 to −0.000], $p < 0.05$).[1]

Supplemental Analyses. Although the aim of the study was to consider intuitive eating broadly, we examined whether similar patterns of results would be obtained if we tested the model with each subscale of intuitive eating separately (e.g., Palascha et al., 2021; Tylka & Kroon Van Diest, 2013). Similar patterns of associations between motivation and each intuitive eating subscale were obtained. It is important to note though that the path between controlled motivation and intuitive eating was no longer significant when specifically looking at mother's reliance on internal hunger/satiety cues as well as mothers' and daughters' body-food choice congruence. Most importantly, autonomous motivation was positively related with three intuitive eating subscales but was negatively related to the "unconditional permission to eat" subscale (for both mothers and daughters).

5. Discussion

The present investigated how motivation for eating behaviors is related to intuitive eating and well-being outcomes in the mother-daughter dyad. In line with our first objective, we observed a mirror effect between the mother's and daughter's regulation of eating behaviors, intuitive eating, and well-being. Results revealed that both mothers' and daughters' autonomous and controlled regulation of eating behaviors moderately mirror each other. Moreover, we found that mothers and daughters tended to report similar levels of intuitive eating and well-being. This mirroring effect adds to our understanding of the relational dynamics around eating regulation and supports past research regarding the similarities existing between mothers and their daughters around food-related behaviors and emotions (e.g., Lewis et al., 2015).

In line with our second objective examining the actor effects, the results of our study revealed that both mothers' and daughters' autonomous motivation was positively associated with their own intuitive eating while controlled motivation was negatively associated with intuitive eating. Moreover, we found that mothers' and daughters' intuitive eating was positively associated with their own well-being. These finding are consistent with both evidence of intuitive eating's positive links to health and well-being (Schaefer & Magnuson, 2014) as well as a growing body of literature that highlights the benefits of autonomous motivation and the perils of controlled motivation for regulating eating behaviors. Indeed, in two recent studies Guertin and Pelletier (2022) found that autonomous motivation was positively associated with planning and self-monitoring eating *quality,* which was in turn associated with more healthy eating and less unhealthy eating. Meanwhile controlled motivation was linked with greater planning and self-monitoring of eating quantity, which was, in turn, positively associated with bulimic symptoms. An autonomous regulation, versus a controlled regulation, has also been found to longitudinally improve the eating habits and physical health of patients with cardiovascular diseases (Guertin et al., 2015, 2017). Our study extends these findings to the benefits of autonomous motivation for intuitive eating, a highly effective lifestyle approach to positive relationship with food and well-being. These analyses were obtained controlling for dieting and desire to lose weight.

Examination of partner effects revealed that the path from mother's intuitive eating to daughter's well-being was significant whereas the path from daughter's intuitive eating to mother's well-being was not. In other words, mothers who reported higher levels of intuitive eating were more likely to have a daughter that reported higher well-being. This suggests that mothers' intuitive eating style may not only carry benefits for themselves but is also associated with beneficial well-being outcomes for their daughters. Furthermore, we found a negative indirect effect of mothers' controlled motivation to daughters' well-being via mothers' intuitive eating, suggesting that maternal self-regulation style towards eating behaviors was associated with undesirable effects on daughters' well-being. Future research is needed to explain why low levels of intuitive eating in mothers would be associated with lower well-being in daughters, such as associations with third variables like body positivity (Linardon, 2021) or emotion regulation (Messer et al., 2023) that were not assessed in this study. A possible explanation may be that maternal controlled motivation for eating regulation has recently been linked with less optimal feeding practices (i.e., coercive controlling practices; Carbonneau et al., [2023]) while maternal intuitive eating relates to more optimal feeding practices (Eneli et al., 2015; Tylka et al., 2013). Perhaps daughters who have a mother with high controlled motivation and/or low intuitive eating were more likely to grow up in an environment characterized by pressure, shame, guilt, and restrictions around food. Consequently, these daughters may have been more vulnerable to developing a negative relationship with food and/or their bodies, which might have contributed to lower well-being. Future research should investigate such possibilities.

Although we aimed to look at intuitive eating globally to account for its multifaceted nature, in supplemental analyses we also retested the same model while considering each of the four intuitive eating subscales separately. While similar patterns of results were obtained for three of the subscales, one main difference emerged: the association between autonomous motivation and the "unconditional permission to eat" (UPTE) subscale was negative (while it was positive when the global intuitive eating score or any of the other subscales were used). We were not surprised by this finding as it mirrored previous results observed by Carbonneau et al. (2015). One explanation of this negative association between autonomous motivation and UPTE could be that some of the items of this subscale might be interpreted as disinhibited eating or a loss of control with eating, which we would expect to relate negatively to autonomous motivation. In addition, several other studies have found that the UPTE subscale does not behave like the other dimensions of intuitive eating (e.g., Tylka & Wilcox, 2006), and is not related to the same indices of well-being, such as life satisfaction and positive affect (Tylka et al., 2013).

Our findings also have important applied implications for interventions that aim to enhance intuitive eating in adult women with children, given that our research suggests children mirror their parents' motivation for regulating eating. For example, the successful Health at Every Size® (HAES®) intervention was found to be effective in improving intuitive eating and diet quality in adult women (Carbonneau et al., 2017), but future studies should examine whether effects from these kinds of interventions also transmit to mothers' children. Moreover, these findings highlight the importance of addressing controlled motivation for eating behaviors in parents, since this will not only be associated with poor outcomes for themselves, but may have carryover effects in their children with regards to their well-being.

Daughters did seem to influence their mother's well-being through an unexpected path: daughters' dieting tendencies were negatively related to their mother's well-being. This daughter-to-mother link was surprising, given that research in this area tends to focus on the effects of parental dieting on children (e.g., Brun et al., 2021; Claydon et al., 2019) and not the reverse. This association likely shows mothers' concern for their daughters' wellness in terms of their health, body image, or self-esteem, which is likely to enhance mothers' stress and lower their well-being. It may be that mothers are negatively affected by daughters' dieting because they worry about their daughter getting sufficient nutrients or are concerned about underlying disordered eating. Mothers may also notice changes in their daughters' mood following restrictive

[1] There was no significant direct effect from daughters' intuitive eating to mothers' well-being, so we did not test the indirect effect of this association.

dieting patterns (Arab et al., 2019), which may lead to greater interpersonal conflict and disagreement within mother-daughter dyads. Witnessing daughters' dieting may also trigger negative memories in mothers who may have been previously dieting themselves. They may feel disappointed that they failed to protect their daughters from societal expectations regarding physical appearance or may be concerned about having "passed down" eating or body image issues to their daughters. Future research is needed to replicate this finding and to uncover why daughters' dieting is related to lower maternal well-being.

5.1. Strengths, limitations, and future directions

Strengths of the study included a large sample of mother-daughter dyads and a novel theoretical framework through which to examine the association between motivation, intuitive eating, and well-being. This study also adds to the scarce literature on the benefits of intuitive eating on people other than oneself. The present study was not without limitations. Although both members of a mother-daughter dyad were studied, only data from one measurement point was collected. Future research would benefit from a longitudinal design. The self-report assessment represents another limitation. Future research should investigate whether the other member of the dyad has a similar perception to the reporter with regards to motivation, intuitive eating, and well-being. The relative homogeneity of our sample represents a further limitation that limits the generalizability of our findings – future studies should aim to replicate the reported effects with more diverse participants and in different cultural contexts. Likewise, other familial and peer relationships, such as the father-daughter relationship (e.g., Steinhilber et al., 2020), could be studied to shed additional light on the role of close others in motivation for eating behaviors. Including the father-daughter dynamic would avoid reinforcing stereotypes and biases, particularly regarding the attribution of eating issues primarily to mothers. Future research could also examine whether the patterns of results we obtained with intuitive eating would be replicated if we looked at other forms of internally regulated eating styles (Palascha et al., 2021) such as eating competence and mindful eating.

Several other potential mediators that were assessed in the present study would also deserve careful attention in future work. For instance, stress has recently been shown to negate the positive impact of autonomous eating regulation on health outcomes such as BMI and body fat (Arsiwalla et al., 2018). Another potential mediator is the satisfaction of the three basic psychological needs posited by SDT (Bégin et al., 2018). It is conceivable that greater autonomous motivation for eating behaviors would promote greater autonomy, feelings of competence, and relatedness around food which might in turn be associated with a more intuitive eating style.

6. Conclusion

In sum, the present study highlighted the positive associations between autonomous regulation for eating behaviors, intuitive eating, and well-being and the negative associations between controlled regulation for eating behaviors, intuitive eating, and well-being for both mothers and daughters. Indirect effects from mothers' motivation to daughters' well-being via mothers' intuitive eating were observed, suggesting that daughters of mothers who have a more controlled motivation to regulate their eating behaviors are prone to lower levels of well-being. Meanwhile, daughters' dieting behaviors were negatively related to mothers' well-being, suggesting that daughters' dieting can be associated with concern and stress in the mothers. The present study is important for the growing understanding of the motivational dynamics at play in eating self-regulation within the under-studied mother-adult daughter dyad.

Funding

This work was funded by the Social Sciences and Humanities Research Council of Canada (Grant No. 430-2016-1085), the Fonds de recherche du Québec-Santé (Grant No. 265539) and the Canada Research Chairs Program (Grant No. 2020–00270).

Declaration of competing intertest

All authors have no interest to declare.

Availability of the data

Data from this project will be made available on request to the corresponding author.

Ethical statement

The project was approved (CER-14-203-07.30) by the research ethics board of the University of Quebec in Trois-Rivières.

CRediT authorship contribution statement

Anne Holding: Writing – review & editing, Writing – original draft. **Geneviève Lavigne:** Writing – review & editing, Formal analysis. **Laurence Vermette:** Writing – review & editing. **Noémie Carbonneau:** Writing – review & editing, Supervision, Investigation, Conceptualization.

Declaration of competing interest

All authors have no interest to declare.

Data availability

Data will be made available on request.

Acknowledgements

The authors would like to thank the participants of this study for their time and contribution to the research on women's health and well-being.

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