The mother-daughter-sister triad: The role of female family members in predicting body image and eating behaviour in young women

Melanie Rebecca Deek [a],[*], Ivanka Prichard [b],[c], Eva Kemps [a]

[a] Psychology, College of Education, Psychology and Social Work, Flinders University, Adelaide, Australia
[b] Health & Exercise Sciences, College of Nursing and Health Sciences, Flinders University, Adelaide, Australia
[c] SHAPE Research Centre, Flinders University, Adelaide, Australia

A B S T R A C T

Familial influence, specifically from mothers and sisters, may impact the development of body dissatisfaction and disordered eating in young women. Guided by the Tripartite Influence Model, the present study recruited 422 young Australian women for a survey to determine how appearance pressures and fat talk, exhibited by mothers and sisters, and mediational mechanisms (comparisons and internalisation), are associated with body dissatisfaction, and in turn, disordered eating symptomatology. We also explored differences in perceived ratings of mother versus sister appearance pressures and fat talk. Findings were in the hypothesised directions. Greater appearance pressures and fat talk from mothers and sisters was associated with greater body dissatisfaction, restriction and bulimic behaviours. Furthermore, appearance pressures from mothers and sisters was related to young women's likelihood of engaging in appearance comparisons and thin-ideal internalisation, which was associated with body dissatisfaction, and in turn, disordered eating symptomatology. Finally, participants perceived more appearance pressures from their mothers than their sisters, and perceived their mothers to exhibit greater fat talk than their sisters. The findings extend previous research in an important and novel way by investigating individual agents of female familial influence in addition to the role of fat talk in predicting body dissatisfaction and disordered eating.

1. Introduction

Family members, along with other sociocultural influences, such as the media or peers, can play a key role in the development of maladaptive body image and problem eating behaviour (Keery et al., 2004; Rodgers et al., 2011). In particular, research has demonstrated that female family member influence, namely mothers and sisters, is linked to the development of body dissatisfaction and disordered eating in young women (Brun et al., 2020). Current findings suggest that there may be a gender-linked transmission between female family members, such that mothers and sisters are more likely to model certain eating and body related behaviours to their daughters and female siblings, respectively (Balantekin, 2019). However, very little research has investigated the disaggregated influence of parents and siblings, specifically that of mothers and sisters (McCabe & Ricciardelli, 2003). Because of the unique bond between mothers, daughters, and sisters, and the potential for female family members to influence body image and eating behaviour, an investigation into the mother-daughter-sister triad is warranted.

The potential influence of mothers and sisters on female body image can be explained by the Tripartite Influence Model (Thompson et al., 1999), which proposes that three sociocultural influences (parents, peers and media) affect body image and eating behaviour through two mechanisms: appearance comparisons and internalisation. *Appearance comparisons* is the tendency to compare one's physical appearance to that of others (Schaefer & Thompson, 2014). *Internalisation* refers to the extent to which an individual "buys into" culturally defined and approved ideals of attractiveness (i.e., the thin-ideal; Schaefer & Thompson, 2014; Thompson et al., 1999). Previous cross-sectional studies have confirmed the predicted associations between the Tripartite Influence Model variables, and a wealth of research exists in relation to the influence of the media, parents and peers (e.g., de Carvalho et al., 2017; Shagar et al., 2019; Van den Berg et al., 2002). Some studies have conceptualised the influence of parents more broadly as "family influence" to consider the role of other family members including fathers and siblings (e.g., Van den Berg et al., 2002). However, this limits the conceptualisation of all family members to a single construct, rather than

---

disaggregated agents of familial influence (i.e., mothers, fathers, brothers, sisters separately). Indeed, when investigated as individual agents of influence, sisters and female peers have been found to be of equal importance as social comparison targets, in that young women reported comparing their physical appearance with their sisters as often as they do with their female peers (Coomber & King, 2008). The sibling relationship is considered to be unique and distinct from other family relationships, in that it serves a dual purpose of both peer and familial, whereby siblings have the potential to inform and interconnect with peer relationships outside of the family home environment (Buist et al., 2013; Johnson & Salafia, 2022). As such, it is likely that sibling relationships, in contrast to parent-child relationships, function more similarly to peer relationships. Of particular interest to the present study are the pathways for mothers as 'parents' and sisters as 'peers'.

In a sample of U.S. college women, Van den Berg and colleagues (2002) found that the influence of family members on the development of body image and eating problems was fully mediated by appearance comparisons, which in turn contributed to body dissatisfaction and disordered eating (both restriction and bulimia). More recently, de Carvalho et al. (2017) found that among Brazilian undergraduate female students, parental influence was related to both appearance comparisons and internalisation of the thin ideal. A full mediation model was determined whereby comparisons and internalisation contributed to body dissatisfaction, which was associated with disordered eating. In addition, Shagar and colleagues (2019) examined a subsection of the model among young Australian and Malaysian women and found direct links between peer influence and body dissatisfaction, internalisation and restrained eating, and internalisation and bulimic behaviours. Collectively, these findings provide support for the Tripartite Influence Model's predicted relationships, as well as the specific variables of interest of the present study, namely the influence of parents and peers.

Although both mothers and fathers are important sources of influence, mothers are considered to be primary role models for their daughters, and have been found to have more of an influence on the body and eating related beliefs of their daughters than fathers (Abramovitz & Birch, 2000; Balantekin et al., 2014; Francis & Birch, 2005; Rodgers et al., 2009; Wertheim, 2002). This is because mothers can influence their daughters' conceptualisation of body image and eating behaviour through two mechanisms: (1) direct and (2) indirect influence (Arroyo & Andersen, 2016; McCabe & Ricciardelli, 2003). *Direct influence* refers to the maternal attitudes towards shape, weight and eating behaviours that are exerted through verbal messages, such as criticism or encouragement to lose weight (Rodgers & Chabrol, 2009). In young women, direct maternal influence has repeatedly been associated with dieting, restriction and weight-loss attempts, body dissatisfaction, and disordered eating (Balantekin, 2019; Berge et al., 2018; Francis & Birch, 2005; Gross & Nelson, 2000). In contrast, *indirect influence* relates to the modelling of behaviours from mothers, such as disclosing self-related weight talk, dieting, or restricting food intake (Rodgers & Chabrol, 2009). Engaging in verbalisations relating to one's physical appearance and body image (e.g., self-related weight talk) is reflective of the broader construct of *body talk*, which can be further categorised into self-accepting/positive or negative dimensions (Rudiger & Winstead, 2013). *Fat talk* (e.g., "I am so fat", "I look so big in this dress")*,* a type of negative body talk, has been widely investigated as an indirect influence on body image and eating behaviour (Rudiger & Winstead, 2013). Reviews by Shannon and Mills (2015), and Mills and Fuller-Tyszkiewicz (2017), have linked *fat talk* to several maladaptive body-image outcomes, such as body dissatisfaction, drive for thinness, perceived sociocultural pressure for thinness, and disordered eating, among young women in Western society.

Cross-sectional research has consistently demonstrated the negative impacts of fat talk amongst female family members (i.e., mothers and daughters) on body image and disordered eating behaviours. For instance, Arroyo and Andersen (2016) investigated the relationship between appearance-related communication and body image outcomes amongst mother-daughter dyads (daughters were aged between 18 and 25 years). They found that mothers' and daughters' fat talk were significantly related to one another and to their own negative body image behaviours (i.e., body dissatisfaction, body surveillance, drive for thinness, bulimic tendencies), and mothers' fat talk was positively related to daughters' bulimic behaviours. Rogers et al. (2017) explored fat talk amongst 17- to 26-year-old undergraduate female students and their mothers, and found that fat talk exhibited by mothers was a significant predictor of daughters' fat talk. Similarly, Chow and Tan (2018) found that when both mothers and their adolescent daughters (aged between 11 and 18 years) engaged in high levels of fat talk, this was associated with a greater risk of daughters exhibiting eating pathology and depressive symptoms. More recently, Jones and Young (2021) investigated the relationship between daughters' perceptions of their mother's weight-related behaviours and their own body image concerns across the lifespan (i.e., female participants were aged between 18 and 58 years). They found that mother's fat talk, thin ideal internalisation (extent to which they internalise and idealise a thin body type) and enactment of *extreme* weight-loss behaviours were significantly related to their daughters' body dissatisfaction. They further found that daughters' motivation to lose weight was significantly related to mothers' fat talk and enactment of *extreme* weight loss behaviours. However, mothers' thin ideal internalisation and enactment of *common* weight loss behaviours did not predict daughters' motivation to lose weight. This study demonstrates the ways in which mothers' weight- and body- related beliefs and behaviours may be negatively transmitted via the mother-daughter relationship. Altogether, these findings suggest that mothers' and daughters' engagement in fat talk has the potential to lead to maladaptive body-image and disordered eating outcomes.

With the exception of twin studies, there is currently limited research examining the sister relationship in the context of maladaptive body image and problem eating outcomes. Tsiantas and King (2001) found that both younger and older sisters aged between 14 and 25 years scored comparably on levels of body size distortion, body dissatisfaction and body shape concerns. Furthermore, closest-in-age sisters showed similar levels of body image concerns, sociocultural awareness, and internalisation of the thin ideal (Tsiantas & King, 2001). Coomber and King (2008) found that mothers and closest-in-age sisters were equally important in providing both direct (i.e., disclosing body weight and shape concerns) and indirect (i.e., dieting behaviour) modelling cues related to negative body image and problematic eating behaviours. These findings suggest that both mothers and sisters may contribute to maladaptive body image and problem eating behaviour in young women. However, the generalisability of previous research (i.e., Coomber & King, 2008; Tsiantas & King, 2001) is limited by the use of small sample sizes (41–47 sister sibling pairs). To the best of our knowledge, there is currently no research investigating the sister relationship in the context of fat talk. Nonetheless, research examining the role of negative body talk more generally has found differences between sources of female sociocultural influences. For instance, Berge et al. (2016) found that when children reported on the prevalence of weight-based talk from specific family members, mothers were found to exhibit greater negative body talk than sisters. Furthermore, Rogers et al. (2017) found that mothers' fat talk explained more of the variance in the fat talk exhibited by young women than the perceived fat talk of their female peers. Thus, further investigation of the mother-daughter-sister triad in the context of negative body image and problem eating behaviour, with a specific focus on the sister relationship in the context of fat talk, is warranted.

Given that young women experience mounting pressure to meet societal ideals in the external environment (i.e., media, peers), it is important to distinguish potential negative pathways so that future research has the potential to refocus the family environment, and in particular the mother-daughter-sister relationship, as a 'safe place' (Brun et al., 2020). Accordingly, the present study aimed to determine how the mother-daughter-sister relationship may be instrumental in

body dissatisfaction and disordered eating outcomes among young women. Specifically, we investigated the relationships between the influence/pressures and fat talk from mothers and sisters, in predicting body dissatisfaction, and in turn, disordered eating symptomatology, as mediated by appearance comparisons and internalisation of the thin ideal. Guided by the Tripartite Influence Model, we predicted that negative influence/pressure, and fat talk from mothers and sisters, and mediational factors (comparisons and internalisation), would be associated with greater body dissatisfaction, and in turn, restriction and bulimia (see Fig. 1). Furthermore, we aimed to explore whether differences exist between participants' perceptions of their mothers versus sister's(s') influence/pressures and fat talk. Based on the notion that mothers are one of the first sources of socialisation and considered to be the primary role models for their daughters (Francis & Birch, 2005), we predicted that the influence/pressure of mothers would be greater than that of sisters. Furthermore, based on the findings of Berge et al. (2016) and Rogers et al. (2017), specifically that mothers' negative body talk was found to be a stronger source of influence than that of sisters and female peers, we predicted that mothers would be perceived to express greater fat talk than sisters.

2. Methods

2.1. Participants

Participants were 422 young women (17–25 years) from the Flinders University student population and the wider Australian population. The inclusion criteria were: (a) individuals who identified as women/female, (b) 17–25 years old, and (c) either had a person they most identify with as their 'mother-figure' (i.e., a role model or significant other that fulfils a 'mother' role) and/or at least one sister. Participants were recruited online from undergraduate psychology classes via an advertisement on the Psychology Research Participation System ($n = 94$), Facebook ($n = 70$) and survey sharing websites (Prolific; $n = 258$). Participants were told that the study investigated "factors that may influence people's body image and eating behaviour". They were compensated for their time with course credit or a $5 AUD e-Gift voucher. Given that there is little consensus on the recommended sample size for Structural Equation Modelling (SEM; for a discussion see Sivo et al., 2006), sample size was determined based on Garson's (2008) summary of the literature which suggests the need for at least 100 cases, preferably 200, and that sample sizes of 250–500 have been used in "many articles" and "numerous studies that were in agreement" that fewer than 100 or 150 subjects was below the minimum.

2.2. Measures

2.2.1. Demographics

Participants completed a brief demographics questionnaire relating to their age, gender, country of birth and ethnicity. They were also asked to indicate the person they most identify with as their 'mother-figure' (e.g., biological mother). For consistency and brevity, this is referred to as 'mothers' throughout this paper, encompassing all types of 'mother-figures'. Participants were also asked to indicate their mother's age and country of birth, whether they live at home with their mother, and how close they are with their mother on a 100 mm visual analogue scale, ranging from 'not at all close' to 'extremely close'. Participants were asked to indicate whether they have (a) sister(s), and if applicable, to individually report their sister's(s') age, relation (e.g., biological sister), whether they live at home with their sister(s), and how close they are with their sister(s).

2.2.2. Sociocultural influences/pressures and internalisation of appearance ideals

Four subscales of the Sociocultural Attitudes Towards Appearance Questionnaire (SATAQ-4R; Schaefer et al., 2017) were used. The two
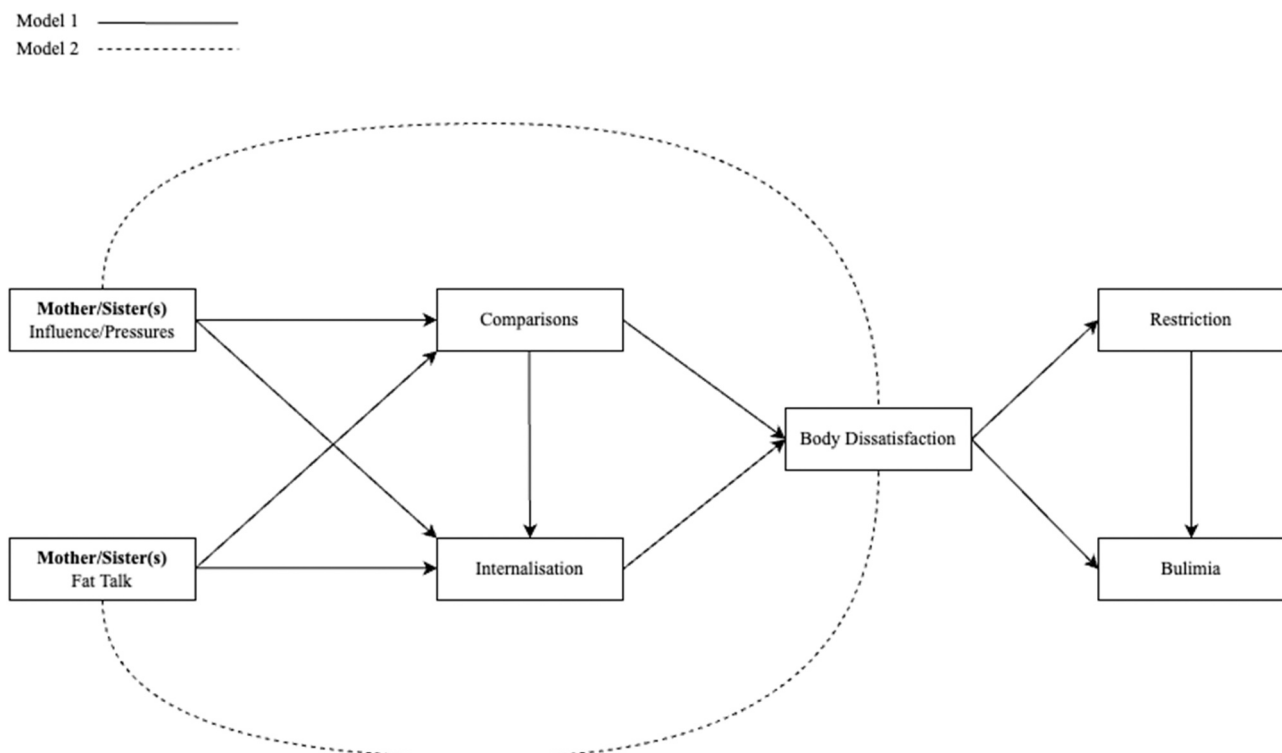

Fig. 1. Proposed Model: Modified version of the Tripartite Influence Model investigating the influence of mothers and sister(s). *Note.* Thompson et al. (1999) originally proposed a primary and secondary model of the Tripartite Influence Model. Model 1 predicts an indirect relationship between influence/pressures and body dissatisfaction as mediated by comparisons and internalisation. Model 2 includes a direct path from influence/pressures to body dissatisfaction. We have similarly proposed these direct and indirect paths for the variable of fat talk to body dissatisfaction.

Pressures Subscales, Pressures – Family and Pressures – Peers, were used to evaluate appearance pressures (i.e., pressures to achieve the societal ideal), whereby the wording of the Pressures – Family Scale was adapted to reflect mothers (4-items, e.g., "I feel pressure from my mother to look thinner"), and Pressures – Peers Scale, whereby the wording was adapted to reflect sister(s), (4-items, e.g., "I feel pressure from my sister [or sisters] to improve my appearance"). The two Internalisation Subscales, Internalisation – Thin/Low Body Fat Scale (4 items, e.g., "I want my body to look very thin") and Internalisation – General Attractiveness Scale (6 items, e.g., "It is important for me to be attractive"), were used to evaluate internalisation of appearance ideals (i.e., personal acceptance of societal ideals). Items are rated on a 5-point scale ranging from 1 (definitely disagree) to 5 (definitely agree), with higher mean scores indicating greater levels of appearance pressures and internalisation of appearance ideals. These subscales have previously demonstrated good convergent validity (generally medium to large associations) with the body dissatisfaction, drive for thinness, and bulimic symptomatology measures of the Eating Disorder Inventory (Schaefer et al., 2017). Internal consistency has also been found to be good in college women (Cronbach's $\propto$ of Pressures – Family =.93; Pressures – Peers =.92; Internalisation – Thin/Low Body Fat =.82; Internalisation – General Attractiveness =.87; Schaefer et al., 2017). The subscales demonstrated acceptable internal consistency in the current sample (Cronbach's $\propto$ of Pressures – Family [mothers] =.91; Pressures – Peers [sister(s)] = .91; Internalisation – Thin/Low Body Fat = .86; Internalisation – General Attractiveness = .87).

2.2.3. Fat talk

The Family Subscale (FFTQ-F) of the Family Fat Talk Questionnaire (FFTQ; MacDonald et al., 2015) was administered to measure self-critical, body-related conversations within the family context. The wording of items was adapted for the present study from 'family members' to 'mothers', and if applicable, to 'sister(s)'. The 8-item Family Subscale, which measures fat talk exhibited by the respondent's family including criticism regarding their physical appearance, was measured separately for mothers (8-items, e.g., "When I'm with my mother, I hear her complain that her arms are too flabby") and sister(s) (8-items, e.g., "When I'm with my sister [or sisters], I hear her [or them] complain that her [or their] arms are too flabby"). Items are rated on a 5-point scale ranging from 1 (never) to 5 (always), with higher mean scores reflecting higher levels of overhearing fat talk in the family context. The Family Fat Talk Questionnaire (FFTQ) has produced valid and reliable scores of fat talk behaviours both exhibited and observed by young adult women within the family context. Previous validation work has found support for the convergent validity of the FFTQ-F, such that scores were significantly correlated with peer fat talk, body dissatisfaction, and social physique anxiety (MacDonald et al., 2015). The subscale has also demonstrated excellent internal consistency (Cronbach's $\propto$ of Family = 0.90; MacDonald et al., 2015). The current revised subscales also demonstrated acceptable internal consistency (Cronbach's $\propto$ of FFTQ-F [mothers] =.91; FFTQ-F [sister(s)] = .92).

2.2.4. Appearance comparisons

The Physical Appearance Comparison Scale-Revised (PACS-R; Schaefer & Thompson, 2014) was used to determine appearance comparisons. The 11-item scale measures the tendency to compare one's physical appearance to the physical appearance of others (e.g., "When I'm out in public, I compare my physical appearance to the appearance of others"). Items are rated on a 5-point Likert scale from 0 (never) to 4 (always), with higher mean scores indicating greater frequency of engaging in physical appearance comparisons. The Physical Appearance Comparison Scale-Revised (PACS-R) has previously demonstrated good inter-item reliability (r = .72; Schaefer & Thompson, 2014) and convergent validity with theoretically related variables (e.g., body satisfaction, eating pathology, sociocultural influences on appearance, and self-esteem; Schaefer & Thompson, 2014). Internal consistency has

also been found to be good (Cronbach's $\propto$ =.91) in a sample of female university students (Robinson et al., 2017). Internal consistency in the current sample was excellent (Cronbach's $\propto$ =.96).

2.2.5. Body dissatisfaction

Body dissatisfaction was measured using the 9-item Body Dissatisfaction Subscale of the Eating Disorder Inventory (EDI; Garner et al., 1983). Items (e.g., "I feel satisfied with the shape of my body") are rated on a 6-point Likert scale from 0 (never) to 6 (always). As recommended by Schoemaker et al. (1994) for non-clinical samples, the entire range of possible scores was used, such that higher scores indicated greater body dissatisfaction. Internal consistency for the Body Dissatisfaction Subscale has been found to be excellent (Cronbach's $\propto$ =.91) in a sample of undergraduate female students (Hendrickse et al., 2017, Keel et al., 2007). Internal consistency in the current sample was acceptable (Cronbach's $\propto$ =.88).

2.2.6. Disordered eating symptomatology (restriction and bulimia)

The Drive for Thinness (Restriction) and Bulimia Subscales of the Eating Disorder Inventory (EDI; Garner et al., 1983) were used to measure disordered eating symptomatology. The Drive for Thinness (EDI-DT) Scale includes 7 items (e.g., "I think about dieting") as does the Bulimia (EDI-B) Scale (e.g. "I eat when I am upset"). Items are rated on a 6-point Likert scale from 0 (never) to 6 (always), with higher scores indicating greater drive for thinness (restriction) and bulimia symptomatology, respectively. The Eating Disorder Inventory (EDI) has previously demonstrated convergent validity with tests measuring conceptually related constructs (e.g., anorexic attitudes, eating restraint, body satisfaction, body dissatisfaction associated with changes at maturation). Internal consistency for the two subscales has been found to be excellent (Cronbach's $\propto$ of Drive for Thinness [Restriction] =.91; Bulimia =.80) in a sample of undergraduate female students (Hendrickse et al., 2017, Keel et al., 2007). The subscales demonstrated acceptable internal consistency in the current sample (Cronbach's $\propto$ of Drive for Drive for Thinness [Restriction] =.91; Bulimia =.89).

2.3. Procedure

The study was approved by the Flinders University's Human Research Ethics Committee (Project ID 4472). The study used a quantitative cross-sectional survey design and participants were tested through an online platform (Qualtrics). A total time commitment of approximately 15 min was required. After providing informed consent, participants completed demographics. They subsequently completed the measures of sociocultural influences, fat talk, appearance comparisons, internalisation of the thin ideal, body dissatisfaction, and disordered eating symptomatology (restriction and bulimia). Finally, participants reported their height and weight from which body mass index (BMI; kg/m^2) was calculated to describe the sample. Attention checks were placed throughout the online questionnaire to ensure that participants were reading and attending to the questions. Rates of failing any *one* attention check were low and ranged from 0.2% to 2.1%. There were no participants who failed *all* the attention checks, and therefore, no participants were removed.

2.4. Data analytical plan and preparation

Data analysis was carried out in seven stages. First, using IBM SPSS v27, the data were reviewed to determine the number of participants who reported having a mother and/or sister(s). Six participants indicated that they did not have a mother, and 195 participants indicated that they did not have a sister. Accordingly, the data were split into two subsamples: (1) all participants who reported having a mother (N=416), to investigate the influence of mothers alone, and then, (2) all participants who reported having both a mother and sister(s) (N=227), to investigate the influence of mothers and sister(s) together to determine

whether sister(s) added any influence beyond that of mothers. The two subsamples are hereon referred to as (1) mothers (only), and (2) mothers and sister(s) (together). Second, the data were screened to determine the amount of missing data at the variable level and to ascertain whether the data were missing at random. There were very few missing data at the variable level for both subsamples of participants who reported having a mother: SATAQ-P and FFTQ-F (0.5%), PACS (1%), SATAQ-I (0.2%), and EDI (across all 3 subscales: 1.2%), and the smaller subsample of participants who reported having both a mother and sister(s) (together): SATAQ-P [mother], SATAQ-P [sisters], FFTQ-F [mother], FFTQ-F [sisters], PACS and EDI (across all 3 subscales: 0.9%), and SATAQ-I (0.4%). Little's (1988) Missing Completely at Random (MCAR) method was used to conduct missing data analyses. Results indicated that the data was likely missing completely at random, for the mothers (only) subsample, $\chi^2 = 44.80$, df $= 49$, $p = .64$, and for the mothers and sister(s) (together) subsample, $\chi^2 = 15.95$, df $= 22$, $p = .81$. Thus, missing data was handled using Expectation-Maximisation (EM) algorithm (Olinsky et al., 2003; Peters & Enders, 2002).

Third, the data were examined for normality and multicollinearity. Following Weston and Gore (2006), data variables were examined for normality on the basis of skewness and kurtosis values. Guidelines suggest that absolute values of skewness > 3 are extreme and kurtosis > 10 suggest a problem (Kline, 2005). No variables displayed substantive skewness or kurtosis. The data were then evaluated for multicollinearity in two ways. The Variance Inflation Factor (VIF) values were computed. All VIF values were < 10, confirming that there was no multicollinearity. Then, bivariate correlations were screened (see Table 1), as recommended by Weston and Gore (2006). The correlations indicated that there was no multicollinearity as all *r* values were < .85 (Kline, 2005).

Fourth, descriptive statistics were computed, and as a first step toward testing the hypotheses, correlations were performed to determine the linear relationships between study variables, which provided a basis for the subsequent mediational analyses. Fifth, following the guidelines of Shrout and Bolger (2002), mediation analyses were performed to investigate the potential direct and indirect (mediating) effects of the predicted variables using AMOS v27. Sixth, Structural Equation Modelling (SEM) was undertaken to test the proposed models separately for the mothers (only) subsample and the smaller subsample of participants who reported having both a mother and sister(s) (together), using AMOS v27 with maximum likelihood estimation. Finally, paired samples t-test were performed to explore whether differences existed between participants' perceived ratings of their mother's versus sister's(s') influence/pressures and fat talk.

3. Results

3.1. Characteristics of the sample

Participants (*N*=422) ranged in age from 17–25 years (*M* = 21.02, *SD* = 2.33) and had a mean BMI of 24.17 kg/m^2 (*SD* = 6.45). All participants resided in Australia and the majority (76.7%) were born in Australia. Four hundred and sixteen participants reported that they had a mother, and 227 participants reported having both a mother and at least one sister. In terms of participants' 'mother-figure', 93.8% identified their biological mother, 55.4% of mothers were born in Australia, and the mean age of mothers was 52.21 years (*SD* = 6.96). More than half (53.7%) of participants reported having a sister, with the majority (67.7%) reporting having one sister, 21.5% two sisters, and 11.5% having three or more. On average, participants reported their sister's mean age of 20.25 years (*SD* = 6.34), and 75.4% identified their sister(s) as biological, with the remaining identified as their half- (20.4%), step- (3.7%) or adoptive sister (0.6%). Participants indicated, on average, a close relationship with their mother (*M* = 76.44, *SD* = 23.1) and sister(s) (*M* = 71.55, *SD* = 24.29). Concerning living arrangements, more than half (63.2%) of participants were living at home with their mother, and 43.6% were living at home with at least one of their sisters.

3.2. Relationships between study variables

Pearson's correlations can be seen in Table 1 for both the subsample of participants who reported having a mother (only) and the smaller subsample of participants who reported having both a mother and sister(s) (together), which shared a similar pattern. Across both subsamples, the predictor variables of influence/pressure and fat talk were significantly positively correlated, as were the mediational variables, appearance comparisons and internalisation. Furthermore, mother and sister(s) influence/pressures, and fat talk, were also significantly positively correlated. As predicted, influence/pressures and fat talk from both mothers and sister(s) was positively correlated with body dissatisfaction, restriction, and bulimia across both subsamples.

3.3. Tests of mediating (indirect) effects between study variables

Following Shrout and Bolger's (2002) recommendations, bootstrapping of 1000 samples with 95% Confidence Intervals (CIs) using AMOS with maximum likelihood estimation was used to examine the potential mediating (indirect) effects between study variables. When mediation has occurred, the standardised regression coefficients (*β*) for

Table 1

Measure scales, means (and standard deviations) and correlation coefficients for the study variables for the (1) mothers (only), and (2) mothers and sister(s) (together) subsamples.

	Scale	M (SD)	1	2	3	4	5	6	7	8	9
Mothers (only)											
1. Mother: Influence/Pressures	1–5	2.53 (1.26)	-								
2. Mother: Fat Talk	1–5	2.48 (1.01)	.38 **	-							
3. Comparisons	0–4	2.21 (1.07)	.26 **	.28 **	-						
4. Internalisation	1–5	3.93 (.70)	.21 **	.18 **	.67 **	-					
5. Body Dissatisfaction	0–6	3.68 (1.04)	.40 **	.20 **	.60 **	.56 **	-				
6. Restriction (Drive for Thinness)	0–6	3.45 (1.26)	.29 **	.25 **	.69 **	.73 **	.70 **	-			
7. Bulimia	0–6	2.58 (1.15)	.36 **	.25 **	.55 **	.40 **	.57 **	.65 **	-		
Mothers and Sister(s) (together)											
1. Mother: Influence/Pressures	1–5	2.58 (1.25)	-								
2. Sister(s): Influence/Pressures	1–5	1.95 (1.06)	.39 **	-							
3. Mother: Fat Talk	1–5	2.46 (0.99)	.32 **	.24 **	-						
4. Sisters(s): Fat Talk	1–5	2.02 (0.91)	.17 *	.43 **	.39 **	-					
5. Comparisons	0–4	2.23 (1.05)	.26 **	.35 **	.26 **	.28 **	-				
6. Internalisation	1–5	3.98 (0.65)	.24 **	.24 **	.22 **	.19 **	.63 **	-			
7. Body Dissatisfaction	0–6	3.7 (1.02)	.37 **	.34 **	.19 **	.22 **	.58 **	.56 **	-		
8. Restriction	0–6	3.56 (1.26)	.31 **	.31 **	.25 **	.28 **	.67 **	.71 **	.72 **	-	
9. Bulimia	0–6	2.64 (1.14)	.39 **	.18 **	.17 **	.21 **	.51 **	.39 **	.58 **	.64 **	-

Note. Significant correlation coefficients (***p* < .01, **p* < .05) are boldfaced.

indirect effects are significant if the 95% biased-corrected confidence intervals (CIs) do not contain zero. Full mediation was determined by having only a significant *indirect* path in the model, whereas partial mediation was indicated by having both significant *indirect* and *direct* paths (taken from the regression weights table).

3.3.1. *Influence/pressure, fat talk → comparisons, internalisation → body dissatisfaction*

Simple path analyses were conducted with comparisons and internalisation as mediators between the predictor (influence/pressure and fat talk) and outcome variable (body dissatisfaction) for both subsamples: (1) mothers (only), (2) mothers and sister(s) (together). These simple path analyses were undertaken to determine whether there was support for the inclusion of the mediators (comparisons and internalisation) in the later testing of the proposed models.

As can be seen in Table 2, all indirect effects were significant for both subsamples: (1) mothers (only), (2) mothers and sister(s) (together), indicating either full or partial mediation for the predicted paths. Across both subsamples, the proposed mediating mechanisms of comparisons and internalisation partially mediated the relationship between influence/pressures and body dissatisfaction. Likewise, for the mothers (only) subsample, internalisation partially mediated the relationship between fat talk and body dissatisfaction. For the mothers and sister(s) (together) subsample, internalisation fully mediated the relationship between mother's fat talk and body dissatisfaction, but partially mediated the relationship between sister's fat talk and body dissatisfaction. Similarly, and across all path analyses for both subsamples, comparisons fully mediated the relationship between fat talk and body dissatisfaction.

3.3.2. *Comparisons, internalisation → body dissatisfaction → restriction and bulimia*

Further path analyses were conducted with body dissatisfaction as a mediator between the predictor (comparisons and internalisation) and outcome variables (body dissatisfaction → restriction and bulimia). As can be seen in Table 3, there were significant indirect effects between

comparisons and internalisation, and restriction and bulimia via body dissatisfaction for both subsamples, mothers (only), and mothers and sister(s) (together), indicating either full or partial mediation for the predicted paths. For the mothers (only) subsample, body dissatisfaction partially mediated all the relationships between comparisons and internalisation, and restriction and bulimia. For the mothers and sister(s) (together) subsample, body dissatisfaction partially mediated the relationships between comparisons, restriction and bulimia, and internalisation and restriction, and the relationship between internalisation and bulimia was fully mediated by body dissatisfaction.

3.4. *Evaluating the proposed model*

To integrate the findings of the bivariate correlations and mediational analyses, a series of structural models were constructed. The models were examined using the maximum likelihood method of Structural Equation Modelling (SEM) via AMOS 27. The proposed models were assessed for goodness-of-fit (how well the model fits the data) following the recommendations of Hu and Bentler (1999) and Weston and Gore (2006). These included the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Standardised Root Mean Square Residual (SRMR), and the Root Mean Square Error of Approximation (RMSEA). Guidelines for good fit include values of CFI and TLI $\geq .95$, SRMR $\leq .08$, and RMSEA $\leq .06$. Values of CFI and TLI $\geq .90$–.94, SRMR $\leq .09$–.10, and RMSEA $\leq .07$–.10 indicate acceptable fit. The following path models assumed bidirectional (co-varying) relationships between the two predictor variables (influence/pressure and fat talk) in line with the previous correlational analyses.

First, the proposed model was explored for the subsample of participants who reported having a mother (only) (Fig. 2). The fit indices for the initially tested model revealed a good to acceptable model fit, $\chi2 = 16.35$, $df = 4$, $p = .003$, $\chi2/df = 4.08$; CFI = .99 (Good); TLI = .95 (Good); SRMR = .03 (Good); RMSEA = .08 (Acceptable). The model explained 11% of the variance in appearance comparisons, 45% in the internalisation of the thin ideal, 47% in body dissatisfaction, 68% in restrained eating, and 49% in bulimia. Next, to examine the added role

Table 2
Direct effects and significance, standardised regression coefficients (β) for indirect effects, bias-corrected 95% confidence intervals (CIs), and significance of indirect effects on body dissatisfaction via *comparisons and internalisation*.

	Direct Effect (x → y)	Direct path significant?	Indirect Effect (β)	95% CI	Indirect Path Significant?	Mediation
'Mothers' (only)						
Influence/pressures →Comparisons →Body Dissatisfaction	.216	Yes	.138	.088 to .188	Yes	Partial
Influence/pressures →Internalisation →Body Dissatisfaction	.245	Yes	.102	.052 to .149	Yes	Partial
Fat Talk →Comparisons →Body Dissatisfaction	.037	No	.167	.109 to .232	Yes	Full
Fat Talk →Internalisation →Body Dissatisfaction	.107	Yes	.099	.049 to .153	Yes	Partial
'Mothers' (together)						
Influence/pressures →Comparisons →Body Dissatisfaction	.237	Yes	.136	.073 to .206	Yes	Partial
Influence/pressures →Internalisation →Body Dissatisfaction	.252	Yes	.121	.067 to .187	Yes	Partial
Fat Talk →Comparisons →Body Dissatisfaction	.042	No	.153	.070 to .240	Yes	Full
Fat Talk →Internalisation →Body Dissatisfaction	.073	No	.122	.055 to .197	Yes	Full
Sister(s) (together)						
Influence/pressures →Comparisons →Body Dissatisfaction	.155	Yes	.185	.120 to .260	Yes	Partial
Influence/pressures →Internalisation →Body Dissatisfaction	.217	Yes	.123	.064 to .192	Yes	Partial
Fat Talk →Comparisons →Body Dissatisfaction	.060	No	.161	.092 to .235	Yes	Full
Fat Talk →Internalisation →Body Dissatisfaction	.118	Yes	.102	.038 to. 172	Yes	Partial

Note. Direct effects are significant at the $p < .05$ level and indirect effects are significant if the CIs do not contain zero.

Table 3

Direct effects and significance, standardised regression coefficients (β) for indirect effects, bias-corrected 95% confidence intervals (CIs), and significance of indirect effects on restriction and bulimia via *body dissatisfaction*.

	Direct Effect (x → y)	Direct path significant?	Indirect Effect (β)	95% CI	Indirect Path Significant?	Mediation
'Mothers' (only)						
Comparisons →Body Dissatisfaction →Restriction	.501	Yes	.266	.210 to .323	Yes	Partial
Comparisons →Body Dissatisfaction →Bulimia	.353	Yes	.225	.163 to .293	Yes	Partial
Internalisation →Body Dissatisfaction →Restriction	.881	Yes	.237	.192 to .290	Yes	Partial
Internalisation →Body Dissatisfaction →Bulimia	.204	Yes	.280	.221 to .341	Yes	Partial
'Mothers' and Sister(s) (together)						
Comparisons →Body Dissatisfaction →Restriction	.384	Yes	.291	.224 to .378	Yes	Partial
Comparisons →Body Dissatisfaction →Bulimia	.254	Yes	.255	.175 to .350	Yes	Partial
Internalisation →Body Dissatisfaction →Restriction	.449	Yes	.264	.207 to .335	Yes	Partial
Internalisation →Body Dissatisfaction →Bulimia	.092	No	.299	.224 to .404	Yes	Full

Note. Direct effects are significant at the $p < .05$ level and indirect effects are significant if the CIs do not contain zero.
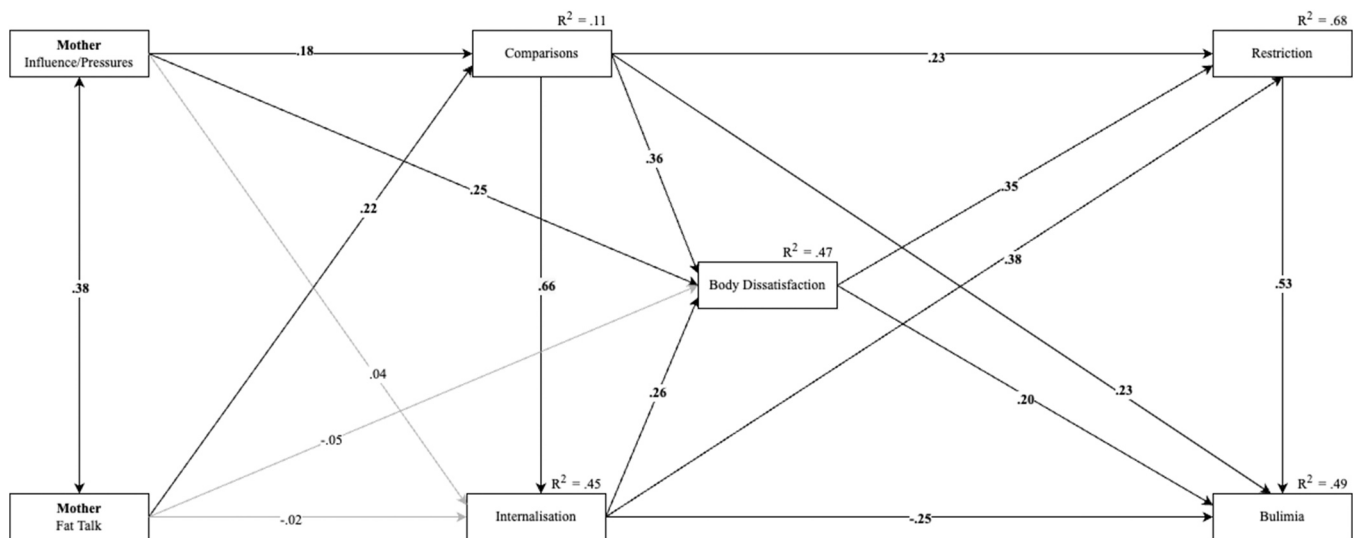

Fig. 2. The model for the mothers (only) subsample which describes the associations between the predictor, mediating and outcome variables, with the standardised regression weights/estimates and squared multiple correlations (R^2). *Note.* Significant coefficients ($p < .05$; *taken from the regression weights table*) are boldfaced and non-significant paths are displayed in grey.
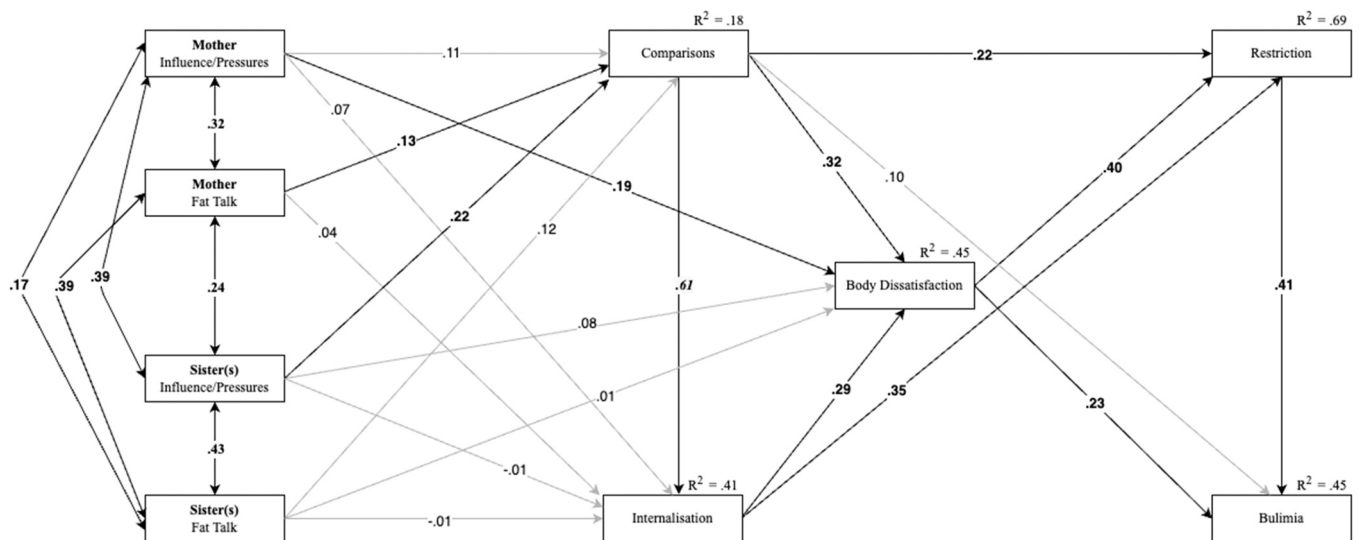

Fig. 3. The model for the mothers and sister(s) (together) subsample which describes the associations between the predictor, mediating and outcome variables, with the standardised regression weights/estimates and squared multiple correlations (R^2). *Note.* Significant coefficients ($p < .05$; *taken from the regression weights table*) are boldfaced and non-significant paths are displayed in grey.

of sister influence, the proposed model was explored for the smaller subsample of participants who reported having both a mother and sister (s) (together) (Fig. 3). The fit indices for the tested model again revealed a good to acceptable model fit, $\chi2 = 35.118$, $df = 10$, $p < .001$, $\chi2/df = 3.51$; CFI = .97 (Good); TLI = .89 (Acceptable); SRMR = .03 (Good); RMSEA = .10 (Acceptable). The model explained 18% of the variance in appearance comparisons, 41% in the internalisation of the thin ideal, 45% in body dissatisfaction, 69% in restrained eating, and 45% in bulimic symptomatology.

3.5. Influence/pressures and fat talk by mothers versus sister(s)

To investigate the final prediction, specifically whether differences exist in participants' perceptions of their mother's versus sister's(s') influence/pressures and fat talk, a series of paired samples t-tests were performed. As predicted, participants perceived being significantly more influenced/pressured by their mothers ($M = 2.57$, $SD = 1.25$) than their sister(s) ($M = 1.95$, $SD = 1.05$), $t(226) = 7.33$, $p < .001$, and perceived their mothers to exhibit greater fat talk ($M = 2.46$, $SD =.98$) than their sister(s) ($M = 2.02$, $SD =.90$), $t(226) = 6.35$, $p < .001$.

4. Discussion

The aim of the present study was to examine the relationships between appearance influence and pressures, and fat talk, from mothers and sisters on body dissatisfaction and in turn, disordered eating outcomes. Specifically, based on the Tripartite Influence Model, we investigated how the perceived influence/pressures from mothers and sister (s), were associated with body dissatisfaction, and in turn, disordered eating symptomatology (restriction and bulimia), via two mediational mechanisms (appearance comparisons and internalisation of the thin-ideal). We also explored differences in perceived ratings of mother versus sister influence/pressures and fat talk. Overall, the findings were in the hypothesised directions.

First, greater influence/pressures and fat talk from mothers and sisters were associated with greater body dissatisfaction, restriction and bulimic behaviours. This is in line with previous research on the influence of mothers (Arroyo & Andersen, 2016; Balantekin, 2019; Berge et al., 2018; Chow & Tan, 2018; Francis & Birch, 2005; Gross & Nelson, 2000; Jones & Young, 2021; McCabe & Ricciardelli, 2003; Rogers et al., 2017) and sister(s) (Coomber & King, 2008; Tsiantas & King, 2001). Second, simple path analyses provided support for the inclusion of the proposed mediating mechanisms in our modified version of the Tripartite Influence Model. Specifically, comparisons and internalisation, and body dissatisfaction, were found to have direct and/or indirect effects between the predictor and outcome variables. This supports previous literature that has investigated the way in which the broader influence of family members and female peers interacts with mediational mechanisms, such as appearance comparisons and internalisation of the thin ideal, and body dissatisfaction (de Carvalho et al., 2017; Rodgers et al., 2011; Shagar et al., 2019; Van den Berg et al., 2002). Third, specific to the present study, mothers and sisters contributed to young women's likelihood of engaging in appearance comparisons and thin ideal internalisation, which was associated with body dissatisfaction, and in turn, contributed to disordered eating symptomatology (restriction and bulimia). Finally, participants reported significantly more influence/pressure from their mothers than their sisters, and mothers were perceived to exhibit greater fat talk than sisters.

Guided by the Tripartite Influence Model, our findings provide support for the predicted associations. Perceived influence/pressures and fat talk from both mothers and sisters were positively correlated with one another, as well as with body dissatisfaction, restriction, and bulimia. The influence/pressure and fat talk exhibited by mothers has been previously linked to negative body image outcomes and disordered eating (Arroyo & Andersen, 2016; Balantekin, 2019; Berge et al., 2018; Chow & Tan, 2018; Francis & Birch, 2005; Gross & Nelson, 2000; Jones

& Young, 2021; McCabe & Ricciardelli, 2003; Rogers et al., 2017). In contrast, there is scarce research examining the outcomes of the influence/pressure of sisters, and no research on fat talk by sisters, in the context of negative body image and problem eating behaviour (Tsiantas & King, 2001). As expected, mother and sister(s) influence/pressure and fat talk were significantly positively correlated. It is likely that sisters themselves are influenced/pressured by their mothers, and in turn, may transmit these learnt conceptualisations of body image and eating behaviour to their sisters (i.e., it could be postulated that sisters may also model the behaviours taught by their mothers to their own sister).

Our findings also provide support for the mediating relationships proposed in the Tripartite Influence Model (Thompson et al., 1999). The mediating mechanisms were investigated in two-parts: (1) the impact of sociocultural influences on body dissatisfaction as mediated by appearance comparisons and internalisation, and (2) the relationship between appearance comparisons and internalisation of the thin ideal on restriction and bulimia, as mediated by body dissatisfaction (Thompson et al., 1999). The former constitutes the novel component of our research in which these mediating relationships were replicated within our modified version of the model investigating the sociocultural agents of 'parents' and 'peers', but disaggregated into female familial influence (i.e., mothers and sisters). The latter relationships were also supported; for both mothers and sisters, body dissatisfaction partially mediated all the relationships, except between internalisation and bulimia, which was fully mediated by body dissatisfaction. Overall, appearance comparisons and internalisation, and body dissatisfaction, were found to have a mediating effect, either fully or partially, between the predictor (mother and sister influence/pressure and fat talk) and outcome variables. Our findings are in line with previous research which has investigated the role of family members and female peers, and the mediating mechanisms of appearance comparisons and internalisation in the context of the Tripartite Influence Model (e.g., de Carvalho et al., 2017; Rodgers et al., 2011; Shagar et al., 2019; Van den Berg et al., 2002). However, as previous research has been limited by the conceptualisation of all family members to a single construct, our work provides a novel contribution by investigating disaggregated agents of familial influence, namely mothers and sisters.

When examining the relationship between the influence/pressure exhibited by mothers and sisters on body dissatisfaction, the findings were consistent, such that the relationships were partially mediated (i.e., direct and indirect effects) via comparisons and internalisation for both the mothers alone, and mothers and sister(s) considered together subsamples. The Tripartite Influence Model originally predicted these direct and indirect paths between sociocultural influence/pressures and body dissatisfaction, and evidence exists in support of these pathways (Thompson et al., 1999). However, when investigating the variable of 'fat talk', as exhibited by mothers and sisters, there were differences in the predicted pathways. Notably, mother and sister fat talk was only indirectly related to body dissatisfaction via appearance comparisons. This finding suggests that young women who have mothers and/or sisters who disclose greater fat talk may also report higher levels of appearance comparisons and in turn, body dissatisfaction, due to the indirect modelling of these behaviours (e.g., disclosing negative self-related weight talk in the form of fat talk). This is consistent with previous research suggesting that negative forms of body talk, such as fat talk, may play a functional role in facilitating social comparisons made within female peer groups and the family home environment (Bailey & Ricciardelli, 2010; Corning & Gondoli, 2012; Keery et al., 2005).

In contrast, for thin-ideal internalisation, there were both direct and indirect pathways between mother and sister fat talk and body dissatisfaction. These findings suggest that fat talk exerted by mothers and sisters may have both direct and indirect effects on the development of body image concerns. Specifically, although mother and sister fat talk alone can increase body dissatisfaction, fat talk also has the potential to increase the likelihood of young women internalising the thin ideal, which in turn, contributes to body dissatisfaction. Collectively, these

findings build upon previous research which identified several negative consequences of fat talk, specifically increased body dissatisfaction, in addition to a potential mechanism (internalisation of the thin ideal), which appears to negatively contribute to the risk of developing body image concerns in young women (Kluck, 2010; Webb et al., 2018).

Our final models revealed an overall good fit to the data, demonstrating that the Tripartite Influence Model, originally developed to explain the way in which sociocultural influences affect body image and eating behaviour (Thompson et al., 1999), can be extended to investigate disaggregated agents of influence, namely mothers and sisters, in a targeted population of young Australian women. This is an important contribution as young adulthood (17–25 years) is a particularly sensitive time for women in the development of body image and eating behaviour concerns. Overall, our findings provide support for the usefulness of such a model through targeted analyses, and accordingly, highlight the specific role of female familial influences in contributing to these concerns. Future research may expand on these findings by investigating specific components of the Tripartite Influence Model variables (i.e., parents, peers) to differentiate between other family members (i.e., fathers and brothers versus mothers and sisters).

The finding that participants perceived being significantly more influenced/pressured by their mothers than their sisters, and that mothers exhibited greater fat talk than sister(s), extends previous research in two novel ways. First, while former research has investigated the relationships between mothers and daughters, and between sisters (e.g., Balantekin, 2019; Berge et al., 2018; Coomber & King, 2008; Francis & Birch, 2005; Gross & Nelson, 2000; Tsiantas & King, 2001), the present study is the first known to draw direct comparisons between mother and sister influence in the context of the Tripartite Influence Model. Although our findings were in line with predictions, they contradict some previous research which has found that mothers and sisters were equally important in modelling body image and eating related cues (Coomber & King, 2008). However, these comparisons should be considered in the context of Coomber and King's (2008) sample, specifically, closest-in-age sister pairs (aged 18–25 years), whereas our study included sisters of all ages. Future research could investigate whether differences exist in the influence/pressure and fat talk exerted by multiple sisters of different ages and birth orders (i.e., youngest versus middle versus eldest sister).

One possible explanation for the finding that mothers were considered more influential and exert greater appearance pressure and fat talk than sisters could be that mothers are thought to be the primary source of influence in the family home environment (Brun et al., 2020; Francis & Birch, 2005). Notably, some girls as young as five years of age have been reported to exhibit body dissatisfaction in parallel with their mother's own weight concerns (Davison et al., 2000). Thus, maternal input may be a stronger source of influence and pressure than sisters due to body- and eating- related messages beginning in childhood, a time when the role of the parent, and more specifically, the maternal role is more prominent than that of siblings. Future research could further investigate the mother-daughter-sister relationship by exploring other factors which may shape and contribute to this relationship, such as the type of attachment style (e.g., secure versus insecure attachment) and conversational/communication factors (e.g., responsiveness, attentiveness, reciprocity). Additionally, given that interpersonal changes may occur in the mother-daughter relationship over time, future research could investigate the way in which factors such as the endurance and strength of the relationship may contribute to body- and eating- related outcomes at different ages and stages from childhood to adulthood.

Second, while fat talk exhibited by mothers has been previously examined (e.g., Arroyo & Andersen, 2016; Chow & Tan, 2018; Jones & Young, 2021; Rogers et al., 2017), to the best of our knowledge, there is currently no research investigating the sister relationship in the context of fat talk. This is important because both mothers and sisters are thought to provide modelling cues related to body image and eating behaviour through direct and indirect mechanisms of influence

(Coomber & King, 2008). Thus, examination of indirect influence in the form of fat talk is imperative in determining how mothers and sisters may differentially exert negative body and eating related messages. Overall, the present findings suggest that sisters may be weaker sources of influence/pressure for young adult women, and exhibit less fat talk, than mothers. Future research could explore whether these findings exist across the lifespan of women, including childhood, adolescence or older adulthood.

The study has some limitations that should be acknowledged and addressed in future research. While we aimed to measure the impact of the influence/pressure and fat talk of mothers and sisters on young women, the data collected was self-reported and thus represents participants' perceptions. It is possible that young women with greater thin ideal internalisation and appearance comparisons, and body dissatisfaction and disordered eating symptomatology, may be more sensitive, attentive, and responsive to body and eating related cues. Consequently, these individuals may engage in influence/pressure and fat talk behaviours, thereby eliciting similar behaviours to their female family members. Additional measures as reported by female family members separately would be useful in providing corroborating evidence and confirmation (e.g., self-reports by mother-daughter and sister dyads). Furthermore, the participants were a non-clinical sample of young adult women. Future research should investigate a targeted clinical sample with elevated body image and eating behaviour concerns (e.g., eating disorders), as such populations may be exposed to more influence/pressure and fat talk in the family environment.

Despite these limitations, the present study has some important theoretical and practical implications. Theoretically, the present study extends the growing body of literature on the Tripartite Influence Model, suggesting that it is a useful model to explain the development of body image and eating concerns in young women within the female familial home environment, in addition to the role of fat talk. Overall, the findings suggest that mothers and sisters play a role in influencing daughters' and sisters' conceptualisations of body image and eating behaviour, which in turn contributes to the development of body dissatisfaction and disordered eating outcomes. In so doing, they enhance our understanding of the factors which may contribute to the development of disordered eating and body image concerns in a novel way. Furthermore, the findings provide preliminary support for our predicted pathways from the Tripartite Influence Model, in the context of the mother and daughter, and sister(s), relationships. These will afford future research the opportunity to consider a broader methodological approach (e.g., recruiting female family members, such as mothers, sisters, and daughters, from the same family unit). Research is now needed to ascertain the potential for more positive pathways within the home environment. In addition, given that much of the research in the area of body image concerns and disordered eating has focussed on outcomes in Western 'white' populations, future research should endeavour to explore whether the observed relationships exist in other cultures.

At a practical level, given that young women experience mounting pressure to meet societal ideals in the external environment (e.g., media, peers), the family home environment may have the potential to be a 'safe place' (Brun et al., 2020). At a clinical level, insight into whether individuals with elevated body image and eating behaviour concerns are exposed to appearance influence/pressure or fat talk in the family environment may guide clinicians in terms of treatment options. For example, a clinician may include family members as a focus of inquiry and intervention, and work with them as partners in therapy, to lead to more positive outcomes (e.g., Family-Based Treatment (FBT) for eating disorders; for a review see Lock & Le Grange, 2019). This could involve providing psychoeducation around the promotion of body satisfaction and engagement in healthful behaviours via modelling in the home environment. Importantly, research has shown that the risk for body image concerns and disordered eating in young women can be greatly reduced and prevented before progressing to clinical levels (i.e., eating

disorders, mortality) through early identification and intervention (InsideOut Institute, 2021). Preventative strategies could include school or university-based programs for young women and their families, in addition to caregiver specific prevention programs, such as supporting and educating caregivers to remove any focus on fat talk or to recognise the early signs of an eating disorder (InsideOut Institute, 2021).

In conclusion, the present study has demonstrated a role for dis-aggregated agents of familial influence, namely mothers and sisters, and the mechanism of fat talk, in body dissatisfaction and disordered eating outcomes among young women. The findings extend previous research in an important and novel way by testing and presenting a modified version of a subsection of the Tripartite Influence Model, thereby enhancing our understanding of the factors in the family home environment which shape and inform young women's conceptualisations of eating behaviour and body image. If built upon, the present findings have practical and clinical implications that could help inform family-based interventions which could include mothers and sisters in the delivery of positive body image and eating related behaviours in the home environment.

Role of funding sources

Declaration of Competing Interest

None.

Data availability

Data will be made available on request.

References

Abramovitz, B. A., & Birch, L. L. (2000). Five-year-old girls' ideas about dieting are predicted by their mothers' dieting. *Journal of the American Dietetic Association, 100* (10), 1157–1163. https://doi.org/10.1016/S0002-8223(00)00339-4

Arroyo, A., & Andersen, K. K. (2016). Appearance-related communication and body image outcomes: Fat talk and old talk among mothers and daughters. *Journal of Family Communication, 16*(2), 95–110. https://doi.org/10.1080/15267431.2016.1144604

Bailey, S. D., & Ricciardelli, L. A. (2010). Social comparisons, appearance related comments, contingent self-esteem and their relationships with body dissatisfaction and eating disturbance among women. *Eating Behaviors, 11*(2), 107–112. https://doi.org/10.1016/j.eatbeh.2009.12.001

Balantekin, K. N. (2019). The influence of parental dieting behavior on child dieting behavior and weight status. *Current Obesity Reports, 8*(2), 137–144. https://doi.org/10.1007/s13679-019-00338-0

Balantekin, K. N., Savage, J. S., Marini, M. E., & Birch, L. L. (2014). Parental encouragement of dieting promotes daughters' early dieting. *Appetite, 80*, 190–196. https://doi.org/10.1016/j.appet.2014.05.016

Berge, J. M., Hanson-Bradley, C., Tate, A., & Neumark-Sztainer, D. (2016). Do parents or siblings engage in more negative weight-based talk with children and what does it sound like? A mixed-methods study. *Body Image, 18*, 27–33. https://doi.org/10.1016/j.bodyim.2016.04.008

Berge, J. M., Winkler, M. R., Larson, N., Miller, J., Haynos, A. F., & Neumark-Sztainer, D. (2018). Intergenerational transmission of parent encouragement to diet from adolescence into adulthood. *Pediatrics, 141*(4). https://doi.org/10.1542/peds.2017-2955

Brun, I., Russell-Mayhew, S., & Mudry, T. (2020). Last word: Ending the intergenerational transmission of body dissatisfaction and disordered eating: a call to investigate the mother daughter relationship. *Eating Disorders*, 1–8. https://doi.org/10.1080/10640266.2020.1712635

Buist, K. L., Deković, M., & Prinzie, P. (2013). Sibling relationship quality and psychopathology of children and adolescents: A meta-analysis. *Clinical Psychology Review, 33*(1), 97–106. https://doi.org/10.1016/j.cpr.2012.10.007

Chow, C. M., & Tan, C. C. (2018). The role of fat talk in eating pathology and depressive symptoms among mother-daughter dyads. *Body Image, 24*, 36–43. https://doi.org/10.1016/j.bodyim.2017.11.003

Coomber, K., & King, R. M. (2008). The role of sisters in body image dissatisfaction and disordered eating. *Sex Roles, 59*(1), 81–93. https://doi.org/10.1007/s11199-008-9413-7

Corning, A. F., & Gondoli, D. M. (2012). Who is most likely to fat talk? A social comparison perspective. *Body Image, 9*(4), 528–531. https://doi.org/10.1016/j.bodyim.2012.05.004

Davison, K. K., Markey, C. N., & Birch, L. L. (2000). Etiology of body dissatisfaction and weight concerns among 5-year-old girls. *Appetite, 35*(2), 143–151. https://doi.org/10.1006/appe.2000.0349

de Carvalho, P. H. B., dos Santos Alvarenga, M., & Ferreira, M. E. C. (2017). An etiological model of disordered eating behaviors among Brazilian women. *Appetite, 116*, 164–172. https://doi.org/10.1016/j.appet.2017.04.037

Francis, L. A., & Birch, L. L. (2005). Maternal influences on daughters' restrained eating behavior. *Health Psychology, 24*(6), 548. https://doi.org/10.1037/0278-6133.24.6.548

Garner, D. M., Olmstead, M. P., & Policy, J. (1983). Development and validation of a multidimensional eating disorder inventory for anorexia nervosa and bulimia. *International Journal of Eating Disorders, 2*(2), 15–34.

Garson, G.D. (2008). Statnotes: Topics in multivariate analysis, canonical correlation. North Carolina State University. Available in: ⟨http://www2.chass.ncsu.edu/garson/pa765/canonic.htm⟩.

Gross, R. M., & Nelson, E. S. (2000). Perceptions of parental messages regarding eating and weight and their impact on disordered eating. *Journal of College Student Psychotherapy, 15*(2), 57–78. https://doi.org/10.1300/J035v15n02_07

Hendricksie, J., Arpan, L. M., Clayton, R. B., & Ridgway, J. L. (2017). Instagram and college women's body image: Investigating the roles of appearance-related comparisons and intrasexual competition. *Computers in Human Behavior, 74*, 92–100. https://doi.org/10.1016/j.chb.2017.04.027

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural equation modeling. A Multidisciplinary Journal, 6*(1), 1–55. https://doi.org/10.1080/10705519909540118

InsideOut Institute. (2021). Australian eating disorders research and translation strategy 2021–2031. InsideOut Institute for Eating Disorders, Central Clinical School, Faculty of Medicine and Health. A national project funded by the Australian Government, Department of Health. ⟨https://insideoutinstitute.org.au/assets/aus_eating_disorder_research_-strategy_23mar23.pdf⟩.

Johnson, E. L., & Salafia, E. H. B. (2022). Mediating effects of intimacy between body talk and girls' body dissatisfaction: The forgotten sibling relationship. *Journal of Youth and Adolescence, 51*(6), 1230–1240. https://doi.org/10.1007/s10964-022-01590-9

Jones, C. C., & Young, S. L. (2021). The mother-daughter body image connection: The perceived role of mothers' thoughts, words, and actions. *Journal of Family Communication, 21*(2), 118–126. https://doi.org/10.1080/15267431.2021.1908294

Keel, P. K., Baxter, M. G., Heatherton, T. F., & Joiner, T. E., Jr (2007). A 20-year longitudinal study of body weight, dieting, and eating disorder symptoms. *Journal of Abnormal Psychology, 116*(2), 422. https://doi.org/10.1037/0021-843X.116.2.422

Keery, H., Boutelle, K., Van Den Berg, P., & Thompson, J. K. (2005). The impact of appearance-related teasing by family members. *Journal of Adolescent Health, 37*(2), 120–127. https://doi.org/10.1016/j.jadohealth.2004.08.015

Keery, H., Van den Berg, P., & Thompson, J. K. (2004). An evaluation of the Tripartite Influence Model of body dissatisfaction and eating disturbance with adolescent girls. *Body Image, 1*(3), 237–251. https://doi.org/10.1016/j.bodyim.2004.03.001

Kline, R. B. (2005). *Principles and practice of structural equation modeling* (2nd ed., p. 3). New York: Guilford.

Kluck, A. S. (2010). Family influence on disordered eating: The role of body image dissatisfaction. *Body Image, 7*(1), 8–14. https://doi.org/10.1016/j.bodyim.2009.09.009

Lock, J., & Le Grange, D. (2019). Family-based treatment: Where are we and where should we be going to improve recovery in child and adolescent eating disorders. *International Journal of Eating Disorders, 52*(4), 481–487. https://doi.org/10.1002/eat.22980

MacDonald, D. E., Dimitropoulos, G., Royal, S., Polanco, A., & Dionne, M. M. (2015). The family fat talk questionnaire: Development and psychometric properties of a measure of fat talk behaviours within the family context. *Body Image, 12*, 44–52. https://doi.org/10.1016/j.bodyim.2014.10.001

McCabe, M. P., & Ricciardelli, L. A. (2003). Sociocultural influences on body image and body changes among adolescent boys and girls. *The Journal of Social Psychology, 143* (1), 5 26. https://doi.org/10.1080/00224540309598428

Mills, J., & Fuller-Tyszkiewicz, M. (2017). Fat talk and body image disturbance: A systematic review and meta-analysis. *Psychology of Women Quarterly, 41*(1), 114–129. https://doi.org/10.1177/0361684316675317

Robinson, L., Prichard, I., Nikolaidis, A., Drummond, C., Drummond, M., & Tiggemann, M. (2017). Idealised media images: The effect of fitspiration imagery on body satisfaction and exercise behaviour. *Body Image, 22*, 65–71. https://doi.org/10.1016/j.bodyim.2017.06.001

Rodgers, R. F., Faure, K., & Chabrol, H. (2009). Gender differences in parental influences on adolescent body dissatisfaction and disordered eating. *Sex Roles, 61*, 837–849. https://doi.org/10.1007/s11199-009-9690-9

Rodgers, R., & Chabrol, H. (2009). Parental attitudes, body image disturbance and disordered eating amongst adolescents and young adults: A review. *European Eating Disorders Review: The Professional Journal of the Eating Disorders Association, 17*(2), 137–151. ⟨https://onlinelibrary.wiley.com/doi/pdf/10.1002/erv.907⟩.

Rodgers, R., Charlo, H., & Paxton, S. J. (2011). An exploration of the tripartite influence model of body dissatisfaction and disordered eating among Australian and French college women. *Body Image, 8*(3), 208–215. https://doi.org/10.1016/j.bodyim.2011.04.009

Rogers, C. B., Martz, D. M., Webb, R. M., & Galloway, A. T. (2017). Everyone else is doing it (I think): The power of perception in fat talk. *Body Image, 20*, 116–119. https://doi.org/10.1016/j.bodyim.2017.01.004

Rudiger, J. A., & Winstead, B. A. (2013). Body talk and body-related co-rumination: Associations with body image, eating attitudes, and psychological adjustment. *Body Image, 10*(4), 462–471. https://doi.org/10.1016/j.bodyim.2013.07.010

Schaefer, L. M., & Thompson, J. K. (2014). The development and validation of the physical appearance comparison scale-revised (PACS-R). *Eating Behaviours, 15*(2), 209–217. https://doi.org/10.1016/j.eatbeh.2014.01.001

Schaefer, L. M., Harriger, J. A., Heinberg, L. J., Soderberg, T., & Kevin Thompson, J. (2017). Development and validation of the sociocultural attitudes towards appearance questionnaire-4–revised (SATAQ-4R). *International Journal of Eating Disorders, 50*(2), 104 117. https://doi.org/10.1002/eat.22590

Schoemaker, C., van Strien, T., & van der Staak, C. (1994). Validation of the Eating Disorders Inventory in a nonclinical population using transformed and untransformed responses. *International Journal of Eating Disorders, 15*(4), 387–393.

Shagar, P. S., Donovan, C. L., Loxton, N., Boddy, J., & Harris, N. (2019). Is thin in everywhere?: A cross-cultural comparison of a subsection of Tripartite Influence Model in Australia and Malaysia. *Appetite, 134*, 59–68. https://doi.org/10.1016/j.appet.2018.12.025

Shannon, A., & Mills, J. S. (2015). Correlates, causes, and consequences of fat talk: A review. *Body Image, 15*, 158–172. https://doi.org/10.1016/j.bodyim.2015.09.003

Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods, 7*(4), 422. https://doi.org/10.1037//1082-989X.7.4.422

Sivo, S. A., Fan, X., Witta, E. L., & Willse, J. T. (2006). The search for" optimal" cutoff properties: Fit index criteria in structural equation modeling. *The Journal of Experimental Education, 74*(3), 267–288. https://doi.org/10.3200/JEXE.74.3.267-288

Thompson, J. K., Heinberg, L. J., Altabe, M., & Tantleff-Dunn, S. (1999). Exacting beauty: Theory, assessment, and treatment of body image disturbance. *American Psychological Association.* https://doi.org/10.1037/10312-000

Tsiantas, G., & King, R. M. (2001). Similarities in body image in sisters: The role of sociocultural internalization and social comparison. *Eating Disorders, 9*(2), 141–158. https://doi.org/10.1080/10640260127717

Van den Berg, P., Thompson, J. K., Obremski-Brandon, K., & Coovert, M. (2002). The tripartite influence model of body image and eating disturbance: A covariance structure modeling investigation testing the mediational role of appearance comparison. *Journal of Psychosomatic Research, 53*(5), 1007–1020. https://doi.org/10.1016/S0022-3999(02)00499-3

Webb, J. B., Rogers, C. B., Etzel, L., & Padro, M. P. (2018). "Mom, quit fat talking—I'm trying to eat (mindfully) here!": Evaluating a sociocultural model of family fat talk, positive. *body Image, and mindful Eating in College Women Appetite, 126*, 169–175. https://doi.org/10.1016/j.bodyim.2014.10.001

Wertheim, E. H. (2002). Parent influences in the transmission of eating and weight related values and behaviors. *Eating Disorders, 10*(4), 321–334. https://doi.org/10.1080/10640260290081722

Weston, R., & Gore, P. A., Jr. (2006). A brief guide to structural equation modeling. *The Counseling Psychologist, 34*(5), 719–751. https://doi.org/10.1177/0011000006286345