Feeding beliefs and practices of Chinese immigrant mothers: Validation of a modified version of the Child Feeding Questionnaire

Wei-Hong Liu[a], Kimberley M Mallan[a], Seema Mihrshahi[a,1], Lynne A Daniels[a,*]

[a]Institute of Health and Biomedical Innovation, School of Exercise and Nutrition Sciences, Queensland University of Technology, 60 Musk Ave., Kelvin Grove, QLD 4059, Australia

*Corresponding author:

Professor Lynne A Daniels

Institute of Health and Biomedical Innovation, School of Exercise and Nutrition Sciences, Queensland University of Technology, Kelvin Grove, QLD 4059, Australia.

Phone: +61 7 31386139

Fax: +61 7 31383980

Email address: l2.daniels@qut.edu.au (L.A. Daniels)

[1] Present address: Nutrition Unit, Public Health Group, School of Population Health, University of Queensland, Herston Rd., Herston, QLD 4006, Australia

Abstract

The Child Feeding Questionnaire (CFQ) developed by Birch and colleagues (2001) is a widely used tool for measuring parental feeding beliefs, attitudes and practices. However, the appropriateness of the CFQ for use with Chinese populations is unknown. This study tested the construct validity of a novel Chinese version of the CFQ using confirmatory factor analysis (CFA). Participants included a convenience sample of 254 Chinese-Australian mothers of children aged 1-4 years. Prior to testing, the questionnaire was translated into Chinese using a translation-back-translation method, one item was re-worded to be culturally appropriate, a new item was added (*monitoring*), and five items that were not age-appropriate for the sample were removed. Based on previous literature, both a 7-factor and an 8-factor model were assessed via CFA. Results showed that the 8-factor model, which separated *restriction* and *use of food rewards,* improved the conceptual clarity of the constructs and provided a good fit to the data. Internal consistency of all eight factors was acceptable (Cronbach's α: .60−.93). This modified 8-factor CFQ appears to be a linguistically and culturally appropriate instrument for assessing feeding beliefs and practices in Chinese-Australian mothers of young children.

Keywords: Child Feeding Questionnaire, Chinese immigrants, Confirmatory factor analysis, feeding practices

Abbreviations: BMI = Body mass index, BAZ = BMI-for-age Z-score, CFA = Confirmatory factor analysis, CFQ = Child Feeding Questionnaire

Introduction

Obesity has been identified as an emerging health concern for immigrants who move from a developing country to a developed country. Prevalence rates in immigrant populations increase with longer duration of residence and across generations (Bates, Acevedo-Garcia, Alegria & Krieger, 2008; Oza-Frank & Cunningham, 2010). With a rapid increase of relatively young and highly educated Chinese immigrants in the last decade, Chinese have become the third largest group of international migrants in Australia (Australian Bureau of Statistics, 2009, 2013). However, there is currently little information available regarding the health status of these immigrants and their children.

An increasing body of evidence suggests that early life feeding experiences have important short- and long-term influences on the development of eating behaviors and dietary intake, and may consequently impact on children's weight status (Ventura & Birch, 2008; Rodgers et al., 2013). For example, Australian studies have demonstrated that children are exposed to non-nutritive, energy dense food from as young as 12 months of age (Webb et al., 2005; Chan, Magarey & Daniels, 2010). Similarly, child feeding practices, such as restriction, monitoring and pressure to eat, are commonly used with very young children (e.g. 1-4 years old) (Chan, Magarey & Daniels, 2010; Rodgers et al., 2013) and are stable throughout young childhood (Farrow & Blissett, 2012). The Child Feeding Questionnaire (CFQ) (Birch et al.,, 2001) is one of the most frequently used instruments for assessing parental feeding attitudes, beliefs and practices postulated to be linked to childhood obesity risk. The 31-item CFQ was designed to examine seven constructs that broadly fall into two domains: (i) perceptions and concerns related to child feeding and weight status (i.e., *perceived general feeding responsibility, perceived parent weight status, perceived child weight status* and *concern about child overeating and becoming overweight*) that potentially motivate the

use of feeding practices; (ii) practices related to child feeding (i.e., *pressuring to eat*, *monitoring* and *restriction*). These three practices are widely termed 'controlling feeding practices' (Birch et al., 2001). The *restriction* and *pressure to eat* subscales of the CFQ have been extensively used to investigate the relationships between parental feeding practices and children's eating behaviors, dietary intake, and weight status (Ventura & Birch, 2008).

It is well accepted that parental feeding beliefs and practices are influenced by culture (Sherry, Scanlon, Barden & Kallio, 2008). A number of limitations have been identified in previous studies that specifically evaluated the factor structure and psychometric properties of the CFQ with culturally, ethnically and socioeconomically diverse populations, such as Hispanic American (Anderson, Hughes, Fisher & Nicklas, 2005), African American (Anderson et al., 2005; Boles et al., 2010), Australian (Corsini, Danthiir, Kettler & Wilson, 2008) and Japanese (Geng et al., 2009). The conceptualization and measurement of the *restriction* factor of the CFQ has been questioned in these studies. Several approaches have aimed to improve the stability of the *restriction* factor, such as through use of composite items (Birch et al., 2001) or removal of the less reliable items (Anderson et al., 2005; Geng et al., 2009). Yet another approach was taken in an Australian study (Corsini et al., 2008) with preschool children. Based on inspection of the individual items that composed the *restriction* factor it was argued that these may reflect more than one theoretically discrete construct (i.e. feeding practice). Six of the eight items refer to the restriction of foods or parental concerns about child self-regulation of intake, whereas the remaining two items (RST3A and RST3B[2], see Figure 1) refer to the use of food as rewards for good behavior in children. Thus, Corsini and colleagues (2008) proposed an 8-factor solution that incorporated a new 2-item factor

[2] The label of each variable (item) in this study was adapted from those in the original CFQ to facilitate comparison with other studies.

'*food as rewards*'. The authors argued that the 8-factor solution improved the stability and conceptual clarity of the *restriction* factor.

To date, two studies (Cheah & Van Hook, 2012; Huang et al., 2012) have used a subset of factors with Chinese-American parents of children aged 2-12 years, but neither of them assessed the construct validity of the CFQ using confirmatory factor analysis (CFA). Therefore, the first objective of the current study was to evaluate the psychometric properties and factor structure of a modified version of the CFQ with a sample of Chinese mothers of young children in Australia. Both the 7- (Birch et al., 2001) and 8-factor (Corsini et al., 2008) conceptual models of the CFQ were tested and compared in terms of overall model fit and individual item-factor loadings. In line with previous research (Birch et al., 2001; Corsini et al., 2008; Geng et al., 2009), the second objective was to examine the association between the CFQ factors in the 'best-fitting' model and children's weight status.

Methods

Participants

Chinese mothers living in Australia were the target group for this study. Additional eligibility criteria for these mothers were: (i) being born in mainland China, Hong Kong, Macau or Taiwan; (ii) having a child between 1-4 years of age who did not have a health condition that would affect his/her diet and growth, and (iii) having lived in Australia for no more than 10 years. These criteria ensured relative homogeneity in terms of participants' cultural backgrounds and life stage. Mothers with more than one child within the target age group were asked to provide information on the youngest child.

Procedure

After obtaining ethics approval from the Human Research Ethics Committee of the Queensland University of Technology (Approval number: 0900001173), a convenience sample was recruited from Brisbane, Sydney and Melbourne between February 2010 and May 2011. Recruitment strategies included on-site visits to childcare facilities, Chinese grocery shops, Chinese language schools, churches and community centers, messages on the Australian-Chinese immigrant's forum and local Chinese newspapers, and word of mouth. Mothers were asked to complete a questionnaire regarding their feeding beliefs and use of specific feeding practices. They were given the choice of receiving and completing a paper questionnaire or completing the questionnaire online. As approved by the relevant ethics committee, participants were informed that completion and return of the questionnaire was considered informed consent. Mothers who completed and returned the questionnaire were placed in a draw to win one of six $50 supermarket vouchers.

The questionnaire was translated into traditional Chinese by the first author. To ensure the accuracy of the translation, three bilingual postgraduate health science students who were originally from mainland China, Taiwan, or Hong Kong reviewed the translated questionnaire; then a bilingual Research Assistant with a health science background independently performed the back-translation. The first author and the Research Assistant were experienced in professional interpreting and translating, respectively. The questionnaire was pretested with a convenience sample of 18 Chinese immigrant mothers who were not included in the study. All of the mothers preferred to have the English and Chinese questions presented side by side. No other changes were made to the translated questionnaire after the pre-testing.

Measures

Modified Child Feeding Questionnaire

To improve the age and cultural relevance of the original CFQ (Birch et al., 2001), the following modifications were made. First, the item related to perception of mothers' own weight in their 20s (PPW3) was not included in this questionnaire. The rationale was that the other item (PPW4: *how would you describe your own weight at present*) on the *perceived parent weight* factor may have overlapped given that many of the target group may still be in their 20s. Second, three items related to perceptions of children's weight at school age were not included because the children in this study were aged 1-4 years. For these two factors (*perceived parent weight* and *perceived child weight*), additional options '*not sure/don't know*' or '*not sure/not applicable*' were added respectively. Third, given that increasing sugary beverage consumption among preschool children has been reported to be associated with childhood obesity (Bell, Kremer, Magarey & Swinburn, 2005; Welsh et al., 2005), one item on tracking sugary beverages was added to the *monitoring* factor (MN4: *how much do you keep track of cordial or soft drink that your child eats?*). Finally, the item (PE1) '*my child should always eat all of the food on his/her plate*' on the *pressure to eat* factor was reworded to '*my child should always eat all of the rice in his/her bowl*' according to the traditional Chinese meal pattern. A total of 28 items (27/31 of the original CFQ items plus one new item) were presented to the participants.

Anthropometrics characteristics

Mothers' body mass index (BMI) was calculated based on mothers' self-reported own weight and height and "underweight", "overweight" and "obesity" were defined as BMI < 18.5 Kg/m^2, 24 $Kg/m^2 \leq$ BMI < 28 Kg/m^2 and BMI $\geq$ 28 Kg/m^2 respectively, according to Chinese adults BMI classification criteria (Zhou & Coorperative Meta-Analysis Group Of Working Group On Obesity, 2002). Mothers also reported children's current weight and height. Children's BMI-for-age Z-score

(BAZ) was used as an indicator of children's weight status and calculated using the WHO ANTHRO software program (version 3.1), which was based on the WHO gender and age specified Child Growth Standards (World Health Organization, 2006). As children in this study were aged 1-4 years, the WHO reference was used, where underweight is defined as BAZ < -2SDS (Standard deviation score), overweight and obesity are defined as +2SDS ≤ BAZ < +3SDS and BAZ ≥ +3SDS, respectively (World Health Organization, 2008).

Demographic characteristics

Demographic information, including mothers' age, education level, employment status, family income and children's age and gender, was also collected.

Data Analysis

Initial data screening was performed using SPSS (version 19). If the mother chose the additional option '*not sure/don't know*' or '*not sure/not applicable*' on a *perceived parent/child weight* item, it was treated as missing data. The item (PCW3: *how would you describe your child's weight as a preschooler*) was dropped from all analyses due to 41% of participants choosing the response '*not sure/not applicable*'. After making the adjustment, a total of 27 items (as shown in Figure 1) were included in the confirmatory factor analysis. There were less than 4% of missing values in 24 items, however three items (PPW4, PPW2 and CN3) had 7%, 9% and 17% of missing values respectively. Further missing data analysis showed that data were missing at random (Little's MCAR test non-significant; $p = .66$). Therefore, missing data were imputed with a maximum likelihood estimation approach (Tabachnick & Fidell, 2007).

Confirmatory factor analysis of both the original 7-factor model (Birch et al., 2001) and a proposed 8-factor model (Corsini et al., 2008) were conducted using structural equation modeling in AMOS (version 19). Model 1, the 7-factor structure proposed by Birch et al. (2001), was fitted to our data at the item level. This first model included factor-factor correlations, uncorrelated errors and the variance of the first item on each factor fixed to one. Model 2, the 8-factor structure proposed by Corsini et al. (2008), in which RST3A and RST3B (Figure 1) were loaded on a new factor defined as '*use of food rewards*', was also tested. This second model included correlated factors, uncorrelated errors, and the variance of the first item on each factor fixed to one. Adequacy of model fit was assessed using combination of fit indices. Values were compared against recommended cut offs (Hu & Bentler, 1999; Byrne, 2001): normed chi-square (χ^2/df) between 1.0 and 3.0, root mean square error of approximation (RMSEA) value of less than 0.05 (good fit) or 0.05 to 0.08 (satisfactory fit), comparative fit index (CFI) and Tucker-Lewis index (TLI) value of 0.90 or greater. There is no defined level of akaike information criterion (AIC) and the model that fits with the smallest value of AIC is the most parsimonious fitting model.

Partial correlations between mean factor scores and children's weight status (BAZ) (adjusted for child age and gender), and reliability estimates (Cronbach's α) were calculated in SPSS (version 19).

Results

A total of 319 completed questionnaires (264 paper and 55 online questionnaires) were received at the end of the recruitment period. Among these, 65 mothers did not meet the criteria and were excluded. A total of 254 eligible mothers (*M* age = 35.0 years, age range: 24-47 years) and children (52% boys, *M* age = 3.0 years, age range: 1-4 years) were included in the study. Mothers who completed the paper questionnaire (n = 212) were older (*M* age = 35.0 years, SD = 4.0 vs. *M* age =

34.1 years, SD = 4.1) and their children were also older (*M* age = 3.1 years, SD = 1.0 vs. *M* age = 2.4 years, SD = 1.0) than mothers who finished the online questionnaire (n = 42). There were no differences between these mothers in terms of their length of residence in Australia, age at immigration, education level, employment status or self-reported BMI. Most mothers (79%) originated from mainland China, 78% had completed a university undergraduate or postgraduate degree, and 43% were full-time housewives. The average BMI of mothers was 21.5 Kg/m^2 (SD = 2.9) and the prevalence of underweight, overweight and obesity in mothers was 13%, 16% and 2% respectively. The average BAZ of children was 0.15 (SD = 1.52) and the prevalence of underweight, overweight and obesity in these children was 11%, 6% and 3% respectively.

The standardized factor-factor and factor-item loadings and item variances of the two models are presented in Figure 1. In Model 1 (7-factor), although all factor-item loadings were significantly different from zero, loadings and item variance of PPW4 on *perceived parent weight*, PE1 on *pressure to eat*, and five of the eight restriction items (RST1A, 1B, 1C and RST3A, 3B) were less than .40 and less than .20, respectively – indicating that these items were less reliable measures of the factor. Overall, the 7-factor model indicated a satisfactory fit to the data: $\chi^2/df = 2.14$, RMSEA = .07, CFI = .86, TLI = .84.

In Model 2 (8-factor), the decision to load items RST3A and RST3B on the new factor *use of food rewards* was affirmed: factor-item loadings were significant and greater than .70 and item variances were greater than .50. Fit indices showed a good fit: $\chi^2/df = 1.84$, RMSEA = .06, CFI = .90, TLI = .88. Model 2 was more parsimonious than Model 1: AIC reduced from 851 (7-factor model) to 763 (8-factor model).

Overall, in the 8-factor model, the controlling feeding practices factors (i.e. *restriction*, *monitoring*, *pressure to eat* and *use of food rewards*) were positively correlated (r = .25 - .58, $p < .01$). Mothers' perceptions of feeding responsibility were positively associated with their controlling feeding practices (r = .20 - .46, $p < .05$ or $p < .01$). Their perceptions of children's weight were negatively correlated to their pressuring the child to eat (r = -.17, $p < .05$). However, there were no significant relationships found between concerns about their children becoming overweight and controlling feeding practices ($p > .05$).

<Figure 1 insert here>

The mean factor scores and the internal consistency of the factors of the 8-factor model are presented in Table 1. The internal consistency of each factor was acceptable or desirable (Cronbach's α: .60 to .93). Pearson's correlation coefficient and the partial correlation coefficient between each of the CFQ factors and children's weight status (BAZ) are also presented in Table 1. Adjusting for child age and gender, mothers' perceptions of children's weight were positively associated with their children's weight status ($r_{partial} = .30$, $p < .01$); and *pressure to eat* was negatively associated with children's weight status ($r_{partial} = -.19$, $p < .01$).

<Table 1 insert here>

Discussion

This is the first study to validate via CFA a version of the CFQ (Birch et al., 2001) specifically modified for use with Chinese mothers of young children. Four *a priori* modifications were made: (i) translation of the CFQ questionnaire into Chinese using a rigorous translation-back-translation approach; (ii) re-wording one item on the *pressure to eat* factor to be culturally appropriate; (iii) adding a new item regarding monitoring soft drink consumption to the *monitoring* factor, and (iv) removing five items from the *perceived parent/child weight* factors that were not applicable to the

target population of mothers with children less than five years of age. Based on previous literature, we evaluated both a 7- and an 8-factor factor model. Overall, the results supported the validity of the modified CFQ using both a 7- and 8-factor model. However, we argue that the 8-factor model not only provided a more robust fit to the data, but also improved the conceptual clarity of the constructs measured. Child BAZ was only significantly associated with two factors: positively with *perceived child weight* and negatively with *pressure to eat.*

Our results for evaluation of the 7-factor model were consistent with previous studies that found the *restriction* factor to be somewhat unstable (Anderson et al., 2005; Corsini et al., 2008; Geng et al., 2009; Boles et al., 2010). In the original CFQ validation study (Birch et al., 2001) the creation of composite items instead of individual items prior to CFA was used for the *restriction* factor. Anderson et al. (2005) argued that using the composite items may potentially overestimate model fit by attenuating the impact of less reliable items. Another approach has been to remove the less reliable items in this factor (Anderson et al., 2005; Geng et al., 2009). However, this approach may potentially compromise the scope of this behavioral construct. The 8-factor model in which *restriction* and *use of food rewards* were proposed as separate factors improved the stability of the *restriction* factor and the overall fit of the model. We argue that *use of food rewards* and *restriction* are conceptually different constructs and thus should be measured as separate factors. *Use of food rewards* has been used as a stand-alone construct in other measurement tools that assessed parental feeding (Wardle, Sanderson, Guthrie, Rapoport & Plomin, 2002; Anderson, Must, Curtin & Bandini, 2012) and appears to be a common practice in a range of cultures and socio-economic groups (Pocock, Trivedi, Wills, Bunn & Magnusson, 2010). Furthermore, *use of food rewards* and *restriction* appear to have different influences on child health outcomes. For example, using food rewards has been linked to higher unhealthy food consumption in preschool children (Kroller & Warschburger, 2009) and may lead to overeating (Birch, McPheee, Shoba, Steinberg & Krehbiel,

1987). Conversely, parental restriction of unhealthy food intake has shown to be associated with lower consumption of these foods in young children (4-6 years old) (Sud, Tamayo, Faith & Keller, 2010).

In this study, we added an extra item to the *monitoring* factor to assess mothers' tracking of children's soft drink consumption. The addition of this item was supported by the high factor-item loading (.87) and good reliability of the *monitoring* factor (Cronbach's $\alpha = .93$). The rationale for this *a priori* modification to the CFQ was twofold. First, consumption of sugary beverages in preschool children has been positively associated with childhood obesity in developed countries (Bell et al., 2005; Welsh et al., 2005). Second, consumption of sugary beverages by Chinese children appears to be increasing (Ding & Malik, 2008), with one study indicating that 84% of Chinese immigrant children aged 0-5 years in France regularly drank sugary beverages (Rovillé-Sausse, 2005).

We reworded one item (PE1: *my child should always eat all of the rice in her bowl*) on the *pressure to eat* factor according to traditional Chinese meal patterns. This modification may have been problematic. Performance of the item was poorer than reported in other studies that used the original item (i.e. *my child should always eat all of the food on his/her plate*) (Birch et al., 2001; Corsini et al., 2008; Geng et al., 2009). This may reflect variation in mothers' understandings of the question. Specifically, the word '*rice*' in Chinese version of the item can refer to either 'rice' (as intended) or the 'meal' (i.e. rice, vegetables and meat). Pretesting of this questionnaire did not highlight any particular issue with interpretation of this item (or in fact any items in the CFQ), however further item development on this factor appears warranted.

283 In terms of mothers' feeding beliefs, our results showed that mothers' perceptions of feeding
284 responsibility were positively associated with their use of restriction, pressuring children to eat,
285 monitoring of children's food intake and use of food rewards. These findings support the hypothesis
286 that parents' perceived responsibility in child-feeding may prompt their use of control in child
287 feeding (Birch et al., 2001). Previous studies with parents from other cultural backgrounds also
288 reported positive associations between parental perceived feeding responsibility and their use of
289 restriction, pressuring children to eat and monitoring of children's food intake (Spruijt-Metz,
290 Lindquist, Birch, Fisher & Goran, 2002; Kaur et al., 2006; Geng et al., 2009). However, *concern*
291 *about their children becoming overweight* was not associated with any of the feeding practices,
292 including *restriction* in either the 7- or 8-factor model. Previous studies (Birch et al., 2001; Corsini
293 et al., 2008; Geng et al., 2009) reported a positive correlation between mothers' concern about their
294 children becoming overweight and their use of restriction. The absence of this relationship in our
295 sample suggests that mothers' use of restriction may only be motivated by their perceptions of
296 feeding responsibility instead of concerns about their children becoming overweight. In fact,
297 mothers in this study demonstrated high levels of *perceived feeding responsibility* (mean scores of
298 4.3 out of 5), but low levels of concern (mean score of 1.4 out of 5). Neither of these feeding beliefs
299 was associated with their children's weight status.
300
301 Compared to mothers of young children (2-5 years old) from other Australian studies (Corsini et al.,
302 2008; Daniels, Mallan, Nicholson, Battistutta & Magarey, 2013), mothers in this study
303 demonstrated relatively higher levels of *pressure* and *use of food rewards*. These practices are
304 considered inappropriate feeding practices with potentially negative impacts on children's weight
305 because they attenuate children's ability to self-regulate food intake in response to cues of hunger
306 and satiety (Birch, McPheee, Shoba, Steinberg & Krehbiel, 1987). In our sample, *restriction* and
307 *use of food rewards* were not associated with self-reported child BAZ. However, similar to previous

studies (Birch et al., 2001; Corsini et al., 2008; Geng et al., 2009), pressuring children to eat was shown to be negatively associated with children's weight status and mothers who perceived their children as being thin were more likely to apply this strategy. Given that child weight and height were self-reported by the mother, all associations with this variable should be interpreted with caution.

There are several limitations in the current study. First, the cross-sectional nature of the data does not allow for causal relationships to be investigated – in particular the association between maternal feeding practices and child weight. Second, as we purposely selected Chinese mothers who had lived in Australia for no more than 10 years, the generalizability of the findings is limited to recent, first generation Chinese immigrant mothers. Mothers in this study were highly educated and this in part reflected the Australian immigration policy since the late 1990s and the characteristics of recent Chinese immigrants (Australian Bureau of Statistics, 2009; Richardson & Lester, 2004). Nevertheless, the applicability of the questionnaire to less highly educated populations of Chinese mothers is unknown. Third, bias and measurement error associated with mother-reported child anthropometric data are unknown although based on mother-reported child weight and height the prevalence of obesity in our sample was 3% which is similar to the Chinese national survey (2006) that showed the prevalence of obesity in preschool children was 3.4% (Zong & Li, 2012). Studies of the accuracy of parent-reported child weight and height have shown inconsistent results (Dubois & Girad, 2007; Scholtens et al., 2007; Shields, Gorber, Janssen & Tremblay, 2011). For example, a study of mothers with 4-year-old children in Canada (n = 1549) showed that mothers overestimated their children's weight more than their height. This resulted in an overestimation of overweight by 3% at the population level (Dubois & Girad, 2007). Another study with 864 Dutch children at the same age indicated that mean differences between measured and mother-reported body weight, height, and BMI were small. However, over 45% of the overweight children were missed when

using mother-reported data (Scholtens et al., 2007). We acknowledge that objectively measured child weight and height is ideal but was not possible within the current study design. Previous studies have used parent-reported child weight and height information in the validation of instruments related to children eating behavior or parental feeding practices (Sleddens, Kremers & Thijs, 2008; Ainuki & Akamatsu, 2013). Whilst caution is required in interpretation of the child weight data, it should be noted that the primary focus of our study was to assess the factor structure of the modified CFQ.

In summary, following *a priori* modifications to improve the appropriateness of the CFQ (Birch et al., 2001) for use in Chinese immigrant mothers of young children, both a 7- and an 8-factor model were evaluated. The 8-factor structure in which the factors *use of food rewards* and *restriction* were separated was argued to be the best-fitting model in this sample. As a result, the *restriction* factor in our study cannot be compared to previous research that used the original restriction factor of the CFQ. However, this modification has improved the conceptual clarity of the restriction factor and also added another important dimension of measuring controlling feeding practices. Further evaluation of the 8-factor structure in other populations is warranted given previous (Corsini et al. 2008) and current findings. This study also has implications for cross-cultural research on the inter-relationships between maternal feeding practices, child eating behavior and growth. The new Chinese version of the widely used CFQ has been modified to improve the cultural appropriateness of the items and in the current sample was shown to be both reliable and valid.

Conflict of interest statement

The authors have declared no conflict of interest.

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Table 1 Descriptive statistics, internal consistency of each factor, and its correlations with children's weight status (as BAZ) in the 8-factor CFQ model

Factors	Means (SD)	Cronbach's α	Correlation with children's BAZ	
			r	$r_{Partial}$ †
Perceived responsibility	4.26 (0.71)	.76	.02	.02
Perceived parent weight	2.95 (0.41)	.60	.04	.06
Perceived child weight	2.90 (0.54)	.83	.31**	.30**
Concern about child overweight	1.42 (0.72)	.85	.10	.11
Restriction	4.18 (0.80)	.69	.00	-.03
Pressure to eat	3.50 (0.81)	.63	-.21**	-.19**
Monitoring	3.68 (1.12)	.93	.13	.15
Use of food rewards	2.90 (1.16)	.71	.04	.08

Data were collected from 254 Chinese mothers of healthy children aged 1-4 years in Australia.

BAZ = BMI-for-age Z-score; CFQ = Child Feeding Questionnaire (by Birch et al. 2001).

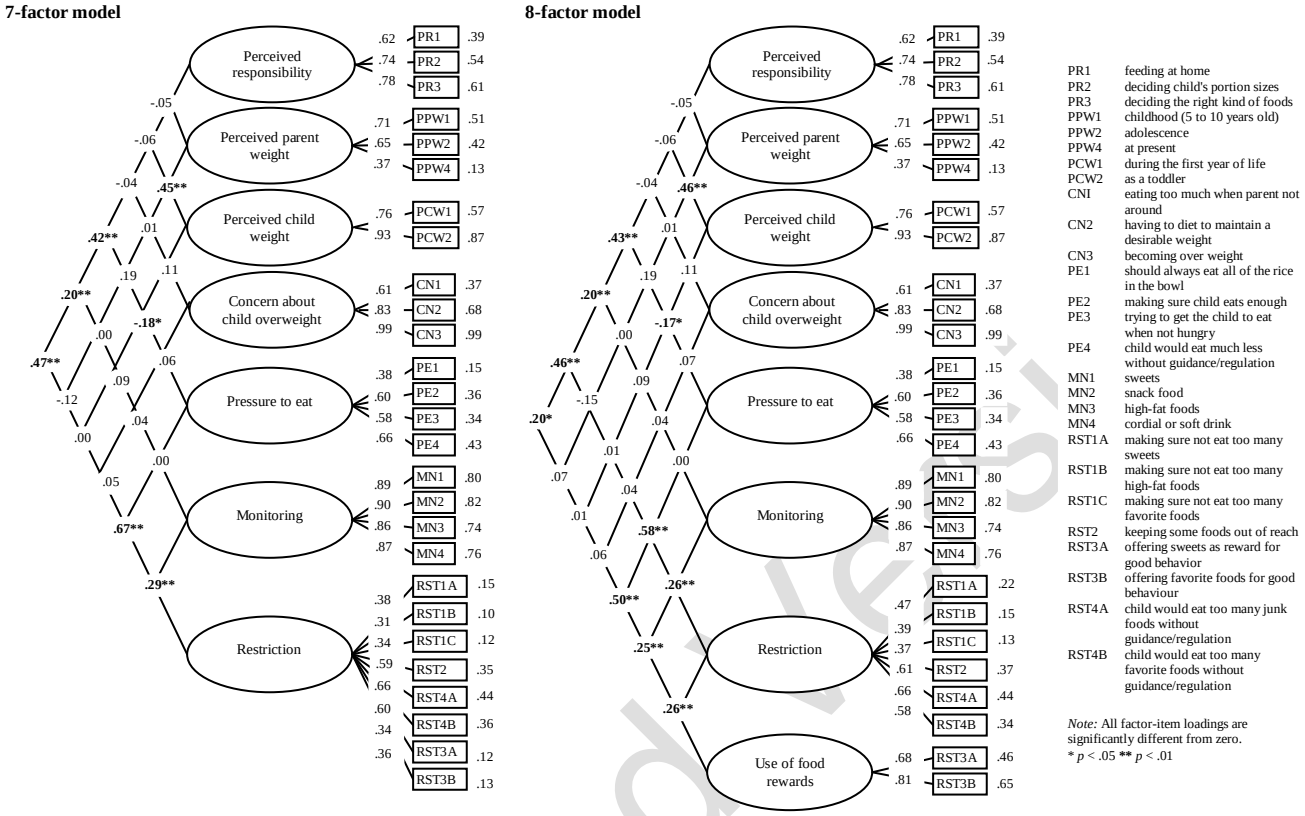
Mean scores range from 1 to 5, higher scores indicate greater parental perceptions or concerns and more frequent use of a feeding strategy.

** $p < .01$

† Adjusted for child age and gender

Figure 1. The 7- and 8-factor model of the modified Child Feeding Questionnaire (Birch et al., 2001) with standardized estimates fitted in a sample of Chinese immigrant mothers (N = 254).

Figure 1.



PR1	feeding at home
PR2	deciding child's portion sizes
PR3	deciding the right kind of foods
PPW1	childhood (5 to 10 years old)
PPW2	adolescence
PPW4	at present
PCW1	during the first year of life
PCW2	as a toddler
CNI	eating too much when parent not around
CN2	having to diet to maintain a desirable weight
CN3	becoming over weight
PE1	should always eat all of the rice in the bowl
PE2	making sure child eats enough
PE3	trying to get the child to eat when not hungry
PE4	child would eat much less without guidance/regulation
MN1	sweets
MN2	snack food
MN3	high-fat foods
MN4	cordial or soft drink
RST1A	making sure not eat too many sweets
RST1B	making sure not eat too many high-fat foods
RST1C	making sure not eat too many favorite foods
RST2	keeping some foods out of reach
RST3A	offering sweets as reward for good behavior
RST3B	offering favorite foods for good behaviour
RST4A	child would eat too many junk foods without guidance/regulation
RST4B	child would eat too many favorite foods without guidance/regulation

Note: All factor-item loadings are significantly different from zero.
* $p < .05$ ** $p < .01$