Why don't they like that? And can I do anything about it? The nature and correlates of parents' attributions and self-efficacy beliefs about preschool children's food preferences

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Title: A cross-sectional study of parents' food choice motives and children's food preferences

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Abstract

Background

Parents influence not only their children's food intakes but also the development of their children's food preferences by shaping children's exposure and experiences with foods. The objectives of this study were to investigate parents' motives for selecting foods for their children and their links with children's food preferences.

Methods

A sample of 371 parents of 2-5-year old children was recruited from a variety of socio-economic groups in two Australian cities. A modified version of the Food Choice Questionnaire was used to assess parent food choice motives. Children's liking/disliking of 176 food and beverage items were reported by the parents on five-point Likert scales. Socio-Economic-Status (SES), the child's sex and parental education levels were also obtained. Patterns of food choice motives were examined with exploratory principal component analysis. Associations between motives and children's food preferences were assessed with Pearson's product moment correlations whilst one-way and two-way ANOVAs tested for socio-demographic differences.

Results

Health, nutrition and taste were key motivators for parents, whereas price, political concerns and advertising were amongst the motives considered least important. Children's food preferences were related in negative ways with the parent food motive factors *Convenient to Prepare* and C*hild Wants,* and in positive ways with *Natural/Ethical* food motive factor. Health and nutrition motives were not associated with children's food preferences.

Conclusions

The results provide preliminary evidence for associations between parents' food choice motives and children's food preferences, and point to a need for a better understanding of the bi-directional influences between children on parents in the feeding context.

Keywords: food choice, food preferences, parental motivations, children, preschool, parents.

Introduction

There are many ways in which parents influence children's eating. Two of the most prominent amongst such influences are exposing the child to foods repeatedly and parental modelling of food consumption [1, 2]. Indeed there is good evidence that parental modelling of consumption and liking of healthy foods is associated with children's greater liking and intake of such foods, including unfamiliar foods [3]. There is also good evidence that repeated taste exposure to a food increases liking and consumption of that food [4-6]. Parents can therefore impact their children's food eating by providing opportunities (e.g. repeatedly offering children foods) and experiences (e.g. parental modelling) that encourage their children to repeatedly taste foods.

An essential prerequisite for parental feeding behaviours such as modelling and repeated exposure is the availability of foods to the parent and the child. Food preferences are primarily learned through experiences with foods, and by shaping such experiences parents can have a significant influence on the development of children's food preferences [14]. Furthermore, children's food preferences are one of the strongest predictors of their food intakes [7-10] and, when learned in childhood, can track into adolescence and adulthood [11-13]. In this way, parental food choices are important in that they not only influence their own and their children's food intakes, but also children's developing food preferences, which can affect children's food intakes in the longer term.

Parents' food choices are undoubtedly important in the development of children's eating behaviours, yet the factors influencing parents' food choices are not well understood. A broad range of factors including taste, price, health and convenience affect individual food choices within the general adult population [15-18]. Whether there are particular patterns of food choice motives unique to parents, though, is not well documented. Two recent studies from Scandinavia add to our understanding of parental food choice motives in those countries [19, 20]. It may be expected, though, that differences will exist between parental food choice motives across countries and socio-demographic groups [15, 18], as well as at different eating occasions (e.g. snacks versus evening meals). Furthermore, whilst parents' food choice motives have been linked with children's food intakes [19, 20] relationships to children's food preferences are not understood at present.

The focus in this study was therefore on describing a broad range of factors that may affect parents' reasons for selecting their preschool aged children's foods in a two eating contexts (evening meal and snack) and on examining relationships between the motives and children's food preferences. Information on parents' food choice motives in different samples and their possible associations with children's food preferences may help to inform recommendations and strategies targeted at parents aimed at influencing the ways in which children's eating behaviours develop. Presently, large numbers of children in Australia [21, 22] and elsewhere [23, 24] consume diets inconsistent with the recommendations of health organisations and a good understanding of the factors affecting children's access to, and consumption of foods is needed [16].

Method

The Design

The data reported here formed part of a larger investigation of parental influence on children's food preferences, and the methodology has been reported in detail elsewhere [25]. In brief, a convenience sample of parents was recruited from various sporting and child-care centres in two medium-sized Australian cities (Melbourne, 44.20% and Adelaide 55.80%). In order to recruit parents and children from a variety of socio-economic levels, centres were selected from three socio-economic groups in each city by selecting suburbs in the bottom, middle and top quintile of the Socio-Economic Index for Areas (SEIFA) Index of Relative Socio-Economic Advantage/Disadvantage (a composite measure of the incomes and the skill level of the workforce) [26]. Parents of children aged between two and five years were targeted at these centres and given a self-completion questionnaire, information letter and consent form. A copy of the questionnaire is available from the authors.

The Instrument

The questionnaire covered the child's liking of 176 foods and drinks chosen to cover the range of foods consumed in Australia (measured on a 5- point Likert scale, anchors: dislike extremely – like extremely) socio-demographic indicators (parent's education level, post-code and child's sex) and parents' food selection criteria. Parents' food selection criteria were derived from the Food Choice Questionnaire (FCQ, Steptoe et al, 1995). In its original form, the 36 items are then clustered into the nine factors of *Health*, *Mood*, *Convenience*, *Sensory Appeal*, *Natural Content*, *Price*, *Weight Control*, *Familiarity* and *Ethical Concern*. The FCQ has been used extensively across a number of different population groups (e.g. [17] [15, 18, 19]. In the present context, the wording of some items was modified such that it was couched in terms of the child. For instance "is what I usually eat" was changed to "is what s/he usually eats". The item "is like the food I ate when I was a child" was removed as it was irrelevant to this sample. Six items based on a study of parents' reasons for serving foods were added: "is what other family members like", "is good quality or fresh", "is what I like", "is what s/he likes" and "provides food variety" [27]. The items "is part of his habit or routine" and "is advertised on TV" were

also included based on literature suggesting they may be important influences on parent's food selections [28, 29]. Respondents indicated how important each of the 44 items were "on a typical day" using a four-point scale (anchors: not at all important – very important).

Data analyses

All statistical analyses were carried out using SPSS (SPSS Inc, Chicago, USA, SPSS for Windows, release 12.0, 2004 REF) and, to reduce the likelihood of Type 1 error, an alpha level of $p<.01$ was selected for statistical significance testing. Food choice motives were examined with exploratory factor analysis (principal components with varimax rotation) as the factor structure of the FCQ varies across different populations [15]. An item was considered to load on a given factor if the factor loading was ≥ 0.40 on that factor and <0.40 on all other factors [30]. Pair-wise deletion of variables was employed. Differences in parents' food choice motivations by SES and parental education level were examined with one-way and two-way ANOVAs.

Relationships between parents' food selection criteria and child's food preferences were examined via two-tailed Pearson product moment correlation analyses. Measures of food preferences were: mean liking for the foods within each *Australian Guide to Healthy Eating* food group (including Extra Foods which are non-core, low nutrient, high energy foods to be eaten in moderation); a measure of how varied the children's food likes were (variety index), the number of liked and disliked and untried foods as well as the Healthy Preference Index [25]. The HPI was constructed by summing scores across each of the dietary guideline measures to provide an overall indicator of how well children's food preferences aligned with dietary recommendations. A description of the construction of the HPI and the variety index can be found in Russell and Worsley [25]. Kappa statistic was used to examine similarity between motives for the snack and evening meal contexts.

Demographic characteristics of the sample

Demographic characteristics of the sample are described in Table 1. Briefly, most respondents were mothers or female carers, over 90% of whom were married or in *de facto* relationships. Over half of the parents were university graduates and there was broad

representation of five SES strata. Most parents were in full- or part-time employment. Over two thirds of the children were four and five years of age and the sexes were evenly balanced. Broadly, the parental sample was representative of the Australian adult population although the sample was better educated [31].

Table 1 Demographic characteristics of the sample.

	***N* (%)[1]**
Respondent	
Mother/female carer	335 (90.8%)
Father/male carer	36 (9.7%)
SES	
5 (highest advantage)	98 (26%)
4	70 (19%)
3	92 (25%)
2	44 (12%)
1 (lowest advantage)	65 (18%)
Age of child	
2 years	31 (8%)
3 years	96 (26%)
4 years	169 (46%)
5 years	75 (20%)
Education of parent	
Completed university or tertiary education	205 (56%)
High school / technical or trade certificate	123 (33%)
Did not complete high school	39 (11%)
Sex of child	
Male	191 (54%)
Female	164 (46%)
Parent's marital status	
Married	312 (84.6%)
De facto/living together	28 (7.5%)
Separated	9 (2.4%)
Divorced	7 (1.9%)
Never married	11 (3.0%)
Parent's employment status	
Home duties, full time	132 (35.6%)
Unemployed	3 (0.8%)

[1] cells may not add up to 100% due to missing data

Student	9 (2.4%)
Retired	1 (0.3%)
Employed, part time	151 (40.7%)
Employed, full time	58 (15.6%)
Other	14 (3.8)

Results

The structure of parental child feeding motivations

Eleven components were extracted from the exploratory principal components analysis, explaining 62.65% of the variance and they were interpretable. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy was 0.88 and Bartlett's test of sphericity was significant ($p<.01$). The factors and item loadings are reported in Table 3. Cronbach's alphas ranged from 0.89 to 0.52 for the extracted factors

Parental criteria for the selection of their children's snack foods

As shown in Table 2, the individual items rated as most important related to purchasing convenience, health and nutrition and good taste (including the child's liking of the food). Least important items included those related to price, television advertising and ethical concerns. The factor *Health and Nutrition* was the most important for parents when selecting their children's foods, with *Convenient to Buy* and *Quality* also highly ranked. For parents, *Price, Natural/Ethical* and *Mood* were far less important factors. Children's desires (*Child Wants* factor*)* was rated higher than the preferences of other members of the family (*Others' Preferences* factor*).* Kappa statistics indicated significant agreement between parents' food selection criteria for their child's snack and for the evening meal hence only the snack food data are presented here and in the remainder of the paper for brevity.

Table 2 – Exploratory principal components analysis of the parents' snack food choice motive items from the FCQ, parents' ratings of the importance of food choice motives for children's snack foods: number of observations, agreement between parents' evening meal scores (kappa statistic), means and standard deviations (SD).

Motive factors and items	*Factor loading (≥.40)*	*N*	Kappa	Mean	SD
Health and nutrition (22.46% variance, α = 0.89)		**345**		**3.17**	**0.53**
Is good for his skin teeth hair nails etc	0.77	386	0.58	3.51	0.72
Keeps him healthy	0.76	385	0.47	3.82	0.42
Contains a lot of vitamins and minerals	0.74	386	0.52	3.59	0.62
Contains natural ingredients	0.66	386	0.61	3.37	0.73
Provides food variety	0.65	386	0.53	3.56	0.61
Is nutritious	0.61	387	0.40	3.76	0.47
Is high in fibre and roughage	0.48	388	0.62	3.09	0.81
Is high in protein	0.48	383	0.61	3.17	0.76
Contains no additives	0.44	387	0.73	2.91	0.85
Is good quality or fresh	0.44	384	0.54	3.80	0.43
Contains no artificial ingredients	0.43	385	0.70	3.07	0.85
Quality (2.70% variance, α=0.68)		**359**		**3.11**	**0.64**
Is good quality or fresh	0.62	384	0.54	3.80	0.43
Contains no artificial ingredients	0.54	385	0.70	3.07	0.85
Can be home made	0.65	387	0.54	3.37	0.80
Convenient to buy (2.45% variance, α=0.64)		**364**		**2.88**	**0.78**
Can be bought in shops close to where I live or work	0.75	386	0.88	2.78	0.99
Is easily available in shops and supermarkets	0.70	387	0.73	3.94	0.84
Sensory appeal (3.64% variance, α=0.71)		**365**		**2.80**	**0.63**
Has a pleasant texture	0.50	386	0.74	2.74	0.91
Looks nice	0.66	387	0.63	2.67	0.94
Smells nice	0.75	387	0.71	2.87	0.89
Tastes good	0.47	388	0.68	3.64	0.56
Convenient to prepare (4.02% variance, α=0.81)		**362**		**2.64**	**0.78**
Can be cooked very simply	0.77	387	0.59	2.53	0.92
Is easy to prepare	0.86	386	0.60	2.59	0.89
Takes little time to prepare	0.79	386	0.30	2.26	0.99
Child wants (6.06% variance, α=0.73)		**357**		**2.51**	**0.49**
Is familiar to my child	0.77	386	0.76	2.70	0.82
Is what he usually eats	0.73	386	0.64	2.76	0.83
Is what he asks me for	0.59	387	0.63	2.48	0.80
Is part of his habit or routine	0.57	384	0.71	2.68	0.86

Is advertised on TV	0.45	387	0.75	1.16	0.51
Is what s/he likes	0.41	387	0.65	3.28	0.67
Weight control (3.05% variance, α=0.77)		**361**		**2.50**	**0.82**
Helps my child control his weight	0.73	385	0.84	2.62	1.12
Is low in calories	0.74	387	0.69	2.34	0.99
Is low in fat	0.79	386	0.73	2.72	0.95
Others' preferences (2.33% variance, α=0.52)		**359**		**2.43**	**0.80**
Is what I like	0.52	383	0.64	2.56	0.97
Is what other family members like	0.69	384	0.59	2.93	0.88
Mood (8.87% variance, α=0.84)		**339**		**2.42**	**0.75**
Helps him cope with life	0.77	380	0.86	2.47	1.08
Helps him cope with stress	0.74	370	0.77	2.13	1.07
Helps him relax	0.73	377	0.70	2.46	1.05
Makes him feel good	0.68	384	0.80	2.75	0.92
Cheers him up	0.63	386	0.69	2.34	0.95
Keeps him awake or alert	0.62	383	0.66	2.33	1.15
Natural ethical (4.33% variance, α=0.74)		**362**		**2.25**	**0.62**
Contains no additives	0.47	387	0.73	2.91	0.85
Contains no artificial ingredients	0.41	385	0.70	3.07	0.85
Comes from countries I approve of politically	0.64	387	0.93	1.52	0.84
Has the country of origin clearly marked	0.66	388	0.87	1.84	0.97
Is packaged in an environmentally friendly way	0.57	388	0.90	2.40	0.96
Price (2.75% variance, α=0.77)		**357**		**2.16**	**0.72**
Is cheap	0.80	381	0.70	1.76	0.85
Is not expensive	0.78	387	0.71	1.97	0.85
Is value for money	0.73	386	0.71	2.59	0.98

Relationships between parents' food choice motives and children's food preferences

Relationships between parents' food choice motives and children's food preferences are reported in Table 3. Statistically significant negative relationships were observed between the C*hild Wants* factor and children's liking of the vegetables group, variety of food preferences, number of liked foods and HPI score and a significant positive relationship with the number of untried foods. In contrast, the *Natural/Ethical* factor was associated with higher liking scores for the vegetables and fruit groups and the variety measure. *Convenient to Prepare* was positively related to children's liking of the Extra Foods,

Meats and Cereals groups. No significant relationships were observed between the other factors and the measures of children's food preferences.

Relationships between parents' motivations for selecting their children's snack foods and children's food preferences

Table 3- Relationships between Parents' Snack Food Selection Motives (Factor Scores) and Indices of Children's Food Preferences (Ns ranged from 269 to 296)

Parents' food choice motives	Measures of children's food preferences										
	Vegetables	**Fruit**	**Extra Foods[2]**	**Meats**	**Cereals**	**Dairy**	**Number of untried foods**	**Number of liked foods**	**Number of disliked foods**	**Variety**	**Healthy Preference Index**
Child wants	-0.14**[3]	-0.11	-0.09	-0.12	-0.14	-0.08	0.17**	-0.20**	0.08	-0.22**	-0.17**
Natural ethical	0.17**	0.21**	0.06	0.04	0.06	-0.01	-0.12	0.14	-0.12	0.18**	0.02
Convenient to prepare	0.00	-0.01	0.21**	0.18**	0.17**	0.11	-0.06	0.15	0.01	0.13	0.10
Price	0.03	0.03	0.06	0.04	-0.03	0.02	0.01	0.02	-0.04	0.00	0.00
Quality	0.00	0.00	0.06	0.09	0.06	0.10	-0.01	0.04	0.00	0.04	0.07
Convenient to buy	0.00	0.01	0.06	-0.03	0.04	0.01	0.10	-0.03	-0.02	-0.05	-0.01
Others' preferences	-0.04	-0.07	-0.05	0.02	0.09	-0.10	-0.02	-0.03	0.11	-0.01	0.00
Sensory appeal	-0.03	-0.04	0.01	-0.02	0.08	0.06	-0.12	0.11	0.07	0.09	0.04
Weight control	0.12	0.05	-0.07	0.04	0.09	-0.05	-0.10	0.08	-0.01	0.06	0.10
Health and nutrition	0.01	0.03	-0.01	0.00	0.02	-0.03	-0.11	0.06	0.10	0.09	0.06
Mood	0.00	-0.06	-0.04	-0.03	-0.09	-0.04	-0.01	-0.06	0.04	-0.06	0.35

[2] Low nutrient, high energy foods to be eaten in moderation

[3] ** $p<0.01$

Relationships between parents' food choice motives and demographic variables: child's age and sex, SES and parental education

No statistically significant differences were observed in parents' food choice motives factor scores by the child's age (*p*s ranged from 0.04- 0.87) and sex (*p*s ranged from 0.04-0.97). There were also few differences in parent's food choice motivations by SES and parental education level. The only statistically significant differences were that parents who had not completed high school scored higher on the factor *Child Wants* ($F, 2, 291=4.92$, $p<0.01$) than those who had completed university/tertiary education.

Discussion

In this study we aimed to understand parents' motives when selecting foods for their children, and whether these were related to children's food preferences. The results showed that health, nutrition and good taste were important drivers for parents when selecting their children's foods. Parents' food choice motives, notably those related to the child's desires and to natural/ethical concerns, were associated with children's food preferences, suggesting that parents' feeding motivations are one possible target to affect changes in children's food preferences and possibly intakes.

Children's liking of a food's taste was amongst the most important considerations for parents when selecting foods for their children, and children's desires were rated higher than other members of the family. This confirms and expands earlier findings noting the influence of children's food preferences and requests for foods on parents' food decisions [32, 33] [34] by quantifying the importance of this motive relative to other competing criteria. Furthermore, here we have shown that the *Child Wants* factor (selecting foods in line with the child's desires) was not only an important criterion for parents, but it was also associated in negative ways with children's food preferences: parents who scored higher on this factor had children who liked the vegetables group less, had less varied food likes and their food preferences were less likely to align with dietary recommendations overall. This finding may be an indication of the central and possibly negative influence of children upon some parents in the socialisation of children's eating.

The results also suggested that the emphasis placed by parents on the child's desires is linked with socio-demographic factors: in the present study, higher scores on the *Child Wants* factor were also associated with lower parental education levels. Child-centredness in feeding may be counterproductive to the development of healthy food preferences in children as selecting for children those foods that they already like or are familiar with may hinder exposure to new foods, and those foods that may require several tastings to become liked, such as vegetables [4, 6, 35]. This, coupled with evidence showing that children have greater freedom over their own food choices [4, 36] and that permissiveness in parental

feeding (i.e. allowing children freedom to eat what and when they wish) is associated with poorer food intakes in children [37], highlights the need to further consider the dynamic interplay of children and parents in the feeding context.

Although children's desires were important to parents when selecting their children's foods, health and nutrition were rated as the most important motives by parents in this sample. This factor was not, however, associated with children's healthier food preferences. Although this cross-sectional research cannot determine directionality of effect, it does suggest a gap exists between parents' health-related food choice motivations and children's food preferences. It is possible that, although nutrition and health were seen as important criteria when selecting children's foods, being motivated by them may not relate to actual provision of more healthful foods [38] due to a lack of nutrition knowledge [39] or the existence of time pressures when selecting foods, for instance [32]. Alternatively, it could be that parents who are motivated to choose healthy foods inadvertently present these foods to children in ways that promote disliking (e.g. pressuring to eat, rewarding children for eating them [39, 40]. The mediating variables between parental health motivations and children's liking of healthy foods require further enquiry.

Whilst health motivations were not related to children's healthier food preferences, interestingly, scores on the *Natural/Ethical* food motive factor were. It is unknown why these types of motivations may be associated with children's healthier food preferences (instead of health motivations). Scores on this factor were not associated with the socio-demographic variables measured here. We speculate that parents who consider natural and ethical criteria when selecting foods may be characterised by a particular value set (e.g. environmentally aware, ethically concerned) or knowledge base (e.g. on how food products are made), that may make the appropriate provision of healthy foods to their children more likely. Future investigations of such motivations may provide additional understanding of the beliefs and behaviours of this group of parents.

We expected that cost considerations may be important to parents, as they are to the general adult population [e.g. 16, 18, 27, 41, 42, 43]. This was not the case, however, with cost considerations being rated amongst the least important motives for parents in the present study. Price was

also one of the least important motives in two Scandinavian studies of parental food choice motives [19, 20] lending weight to the notion that price is less of a consideration than other factors for parents, possibly because of the high priority parents give to children's needs and desires. We also observed few differences in the food selection motives by parental education level or SES, confirming the findings of others [19, 20]. Socio-economic factors can have a significant impact upon the quality of children's diets [44] and therefore differences may also be expected in parental motives. It is possible that the parental food choice motives are a mediator between socio-demographic levels and children's eating behaviours or that the sample was not diverse enough to detect such differences. It may also be the case that whilst parental motives may differ little between socio-demographic groups actual parental food choices and parental feeding behaviours may be the mechanisms through which socio-demographic differences in children's diets emerge.

We also expected to see differences between the motives of parents when choosing children's snack foods and when choosing foods for the evening meal. However, of the 44 possible reasons for selecting foods examined here, none was significantly different in importance between the two eating contexts, suggesting that parents use similar criteria for different eating contexts. This is despite likely differences in the location, company and types of foods that may be consumed [44] [45]. This result suggests that parents' food choice motivations may be more overarching, perhaps being reflective of general beliefs or values rather than context-specific food selection criteria. If this is the case, then it suggests that any attempts to modify parents' food choice motives may benefit from an approach that considers parents' beliefs and values.

Finally, it is also worth noting that when used in this parent sample, the factor structure of the modified FCQ differed in some ways from the original ones of Steptoe et al [16]. These were (a) the existence of *Quality*, *Others' Preferences* and *Child Wants* factors, (b) the *Convenience* factor appeared as separate *Preparation* and *Purchasing* factors in the current study whereas it appeared as one factor in Steptoe et al's (1995), and (c) the *Natural* and *Ethical Concern* factors were combined. Roos et al (2012) also noted *that Ethical Concern* was combined with *Health* in their study of parents' food choice motivations for the family (Roos et al 2012). Although differences would be expected from the original version of the FCQ due to the modification of the questionnaire for the current study, it is likely that parents may have different patterns of

motives from general adult population as they are feeding children, not only themselves. For example, parents, who are typically time-poor, may be more affected by convenience in preparation as opposed to consumption (which is to be done by the child), and this distinction is seen here.

Conclusions

Parents were highly motivated by their child's needs and desires (health, nutrition, food preferences) and less by price and natural or ethical concerns. Links were observed between children's unhealthy food preferences and parents' motivations related to convenience in food preparation and meeting the child's desires. The latter association suggests that children's food likes and dislikes appear to be not only an important determinant of their own food choices, but also those of their parents. There is a need for a better understanding of the dynamic interplay of parents and children in the eating context.

Competing Interests

None.

Authors' contributions

CGR and AW conceived of the study, participated in its design and coordination and helped to draft the manuscript. DGL helped to draft the manuscript. All authors read and approved the final manuscript.

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