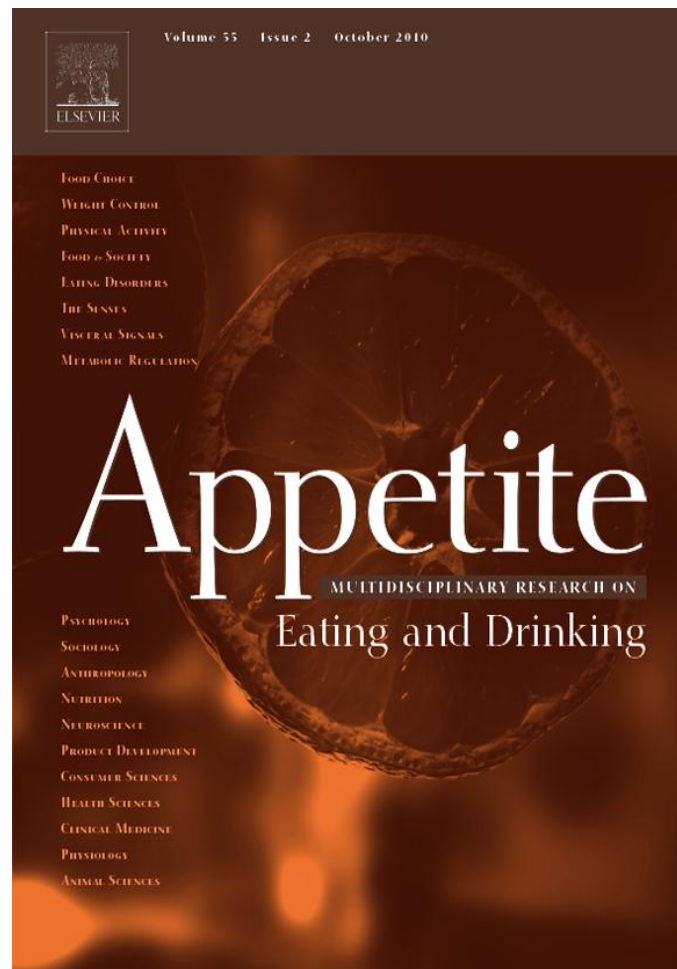


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Research report

Parental feeding styles and adolescents' healthy eating habits. Structure and correlates of a Costa Rican questionnaire[☆]Rafael Monge-Rojas^{a,*}, Vanesa Smith-Castro^b, Uriyoán Colon-Ramos^a, Carlos Garita-Arce^c, Marta Sánchez-López^d, Anne Chinnock^e^a Costa Rican Institute for Research and Education on Nutrition and Health (INCIENSA), Ministry of Health, Tres Ríos, Costa Rica^b Psychology Research Institute, Universidad de Costa Rica (UCR), Campus Rodrigo Facio, San José, Costa Rica^c Comprehensive Healthcare Program for Adolescents, Costa Rican Social Security Fund (CCSS), San José, Costa Rica^d Center for Research and Teaching in Education (CIDE), Universidad Nacional (UNA) Campus Omar Dengo, Heredia, Costa Rica^e Department of Human Nutrition, Universidad de Costa Rica, Campus Rodrigo Facio, San José, Costa Rica

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ABSTRACT

This study designed and validated a questionnaire aimed at examining parental feeding styles to encourage healthy eating habits among Costa Rican adolescents. Adolescents ($n = 133$; mean age 15.4 years), and their parents, participated in the study. The parents completed a parental feeding style questionnaire, and the adolescents completed 3-day food records. Confirmatory factor analyses suggest four distinct parental feeding styles, (a) verbal encouragement of healthy eating behaviors; (b) use of verbal sanctions to indirectly control the intake of healthy food; (c) direct control of access to and intake of food; and (d) use of food to regulate emotions and behavior. There were no correlations between dietary intake and the verbal encouragement of healthy eating behaviors, but there were significant negative correlations between (1) “the use of verbal sanctions to indirectly control the intake of healthy food”, and the consumption of fruit and vegetable, of calcium, iron, vitamin B6 and folic acid intake, and (2) between the “direct control of access to and intake of food” and fast food consumption and total carbohydrates intake. The use of food to regulate emotions and behavior was positively correlated with high energy-dense food consumption. Stratification of the data shows significant differences by gender in the correlations between parental feeding style and dietary intake. Understanding parental feeding styles in a Latin American context is a first step in helping researchers develop culturally-appropriate parenting intervention/prevention strategies to encourage healthy eating behaviors during adolescence.

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Introduction

Research has shown that healthy eating habits developed during adolescence may help teenagers achieve their full growth potential and may pose beneficial health effects throughout life (Lytle, 2002). However, adolescent eating habits are usually inconsistent with healthy eating recommendations, as intakes of saturated and trans fatty acids, as well as sucrose, are high compared to noticeably low intakes of some vitamins, minerals, fiber, fruits, and vegetables (Monge-Rojas, 2001a; Monge-Rojas, 2001b; Muñoz, Krebs-Smith, Ballard-Barbash, & Cleveland, 1997).

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Parental feeding styles have been shown in some countries to help mold eating habits during adolescent years (da Veiga & Sichieri, 2006; de Bourdeaudhuij, 2008; Guilano-Ramos et al., 2007).

A better understanding of the parental feeding styles in a Latin American context might help researchers develop culturally-appropriate parenting intervention/prevention strategies to encourage healthy eating behaviors during adolescence.

Based on social cognitive theory and an ecological perspective, Story and colleagues (Story, Neumark-Sztainer, & French, 2002) have proposed a conceptual model that portrays adolescent eating habits as the result of multiple levels of influence that interact in complex and changing ways. Parents can be a major influence on adolescent food habits as they shape their children's eating environment as providers, models and regulators (Birch & Fisher, 1998; Jenkins & Horner, 2005; Salvy, Vartanian, Coelho, Jarrin, & Pliner, 2008; Savage, Fisher, & Birch, 2007; Story et al., 2002). The influence of parental feeding style on adolescent eating is often conceptualized as a system based on the quality of the parent-child relationship and with dynamically-interrelated dimensions

that include, monitoring (e.g., attention and tracking), behavior management (e.g., negotiation), and social cognitions (e.g., motivation and norms) (Borawski, Ievers-Landis, Lovergreen, & Trapl, 2003).

Parental feeding styles seem to influence each gender differently, possibly as a consequence of different health beliefs, attitudes, food choices, weight concerns, and eating behaviors between boys and girls (Arredondo et al., 2006; Fisher, Mitchell, Smicklas-Wright, & Birch, 2002; Snoek, Engels, Janssens, & van Strein, 2007). Some studies, though not all (Snoek, Engels, et al., 2007), suggest that, among boys, adolescent emotional eating is associated with a significant increase in frequency of fruit and vegetable intake (Nguyen-Mitchell, Unger, & Spruijt-Metz, 2007). On the contrary, other studies, but not all (Snoek, Van Strein, Janssens, & Engels, 2007), have linked emotional eating with a greater risk for developing unhealthy dietary patterns and obesity during adolescence due the overconsumption of energy-dense foods (Nguyen-Mitchell et al., 2007; Steinegger, 2005). Compared to boys, it has been suggested that girls eat more unhealthy foods (i.e. foods that are high in sugar and, fat) when their parents engage in a controlling parenting style regarding their eating (Arredondo et al., 2006; Birch & Fisher, 1998; McCourt & Waller, 1995).

The direction of the association between parental feeding styles and adolescent eating behaviors is still somewhat unclear. Some (de Bourdeaudhuij, 1997; de Bourdeaudhuij & van Oost, 2000; Haerens et al., 2007; Videon & Manning, 2003; Zabinski et al., 2006), but not all (MacFarlane, Crawford, Ball, Savige, & Worsley, 2007) studies have shown that adolescents who report more food rules in the family or perceive more restrictive parenting practices, have a healthier diet and consume less soft drinks and other sugar-sweetened beverages. Similarly, other studies have suggested that adolescents who eat with familial co-eaters have better food regulation and selection than those who eat alone or with strangers (Salvy et al., 2008). It is important to note that most studies have been conducted in European countries and in the United States. Because socio-cultural norms and customs may influence parental attitudes toward child rearing, including feeding, as well as adolescent attitudes towards their parents (World Health Organization, 1999), studying this influence in Latin American countries may reveal yet different levels of impact of parental feeding on adolescent eating behaviors.

The “Parental feeding styles and adolescents’ healthy eating habits. Structure and correlates of a Costa Rican questionnaire” intends to evaluate the influence of parental feeding styles on eating behaviors among Costa Rican adolescents. In this manuscript, the authors present the design, validation and four distinct feeding styles that emerged from this questionnaire, aimed to identify the potential styles of parental influence on the promotion of healthy eating habits among their adolescents. In addition, the authors examined correlates of the questionnaire with adolescent socioeconomic variables, the consumption of selected foods groups and the intake of several nutrients.

Methods

Study sample

The study sample was comprised of 133 urban and rural Costa Rican adolescents, aged 14–18 years old, of mestizo background (mixed Spanish and indigenous people). Adolescents were recruited from eight public high schools (five urban and three rural) in San José, Costa Rica. The schools were chosen from a list of all the public high schools in the capital city of San José, using a proportional-size probability formula (Everitt, 2003). Adolescents’ parents responsible for the access to and intake of food of the adolescent children at home were also invited to participate in the study.

Adolescents’ parents gave their written consent and the adolescents their assent to participate in the study according to the rules provided by the Bioethics Committee of the Costa Rican Institute for Research and Education on Nutrition and Health (INCIENSA).

Ethical procedure

The Costa Rican Institute for Research and Education on Nutrition and Health (INCIENSA) Ethics Committee granted permission for the study. Written parental consent and adolescent assent was required to participate in the study. The only compensation given to adolescents was a lecture on healthy lifestyle presented at each school at the end of the data collection. Information and educational materials about healthy lifestyle were provided at each of these lectures.

Socio-demographic information

The survey included 12 socio-demographic items, age, gender, area, father’s and mother’s educational level (years of formal education), home ownership, consumption of services and ownership of household appliances and services such as Internet, cable TV, hot water system, microwaves and others. Ownership of goods was used to determine an indicator of socioeconomic status according to the methodology described elsewhere by Madrigal (1998).

Anthropometric measurements

Height and weight measurements were obtained according to the guidelines established by Lohman, Roche, and Martorell (1988). Weight was measured without shoes or heavy outer clothing. Height was measured without shoes while the students faced away from the scale. Standing height was measured to the nearest 0.1 cm and weight was measured to the nearest 0.1 kg. Independent duplicate measurements were obtained for height and weight, and the average of both readings – required to be within ± 0.5 cm or 0.5 kg respectively – was used in data analyses. Measurements out of these ranges were not used in data analyses.

Body Mass Index (BMI), was calculated as weight (kg) divided by height (m) squared. Adolescents with BMI at or above the sex-specific 85th percentile were considered to be overweight as suggested by the World Health Organization (WHO Expert Committee on Physical Status, 1995).

Dietary assessment

Dietary intake was determined using 3-day food records (Willet, 1998). The 3 days included one weekend day and the next day or previous two weekdays (Sunday, Monday and Tuesday or Thursday, Friday and Saturday). The adolescents used a series of photographs of foods usually consumed in Costa Rica to estimate portion size while keeping the food record (Chinnock, 2006). Three trained nutritionists used food models and fresh foods to verify serving size of some portions reported by the adolescents.

Nutrient intake was calculated using the Food Processor[®] for Windows version 6.0 (Esha Research, Salem, Oregon), which was modified to include the nutritional value of 60 food preparations commonly consumed in Costa Rica. Dietary intakes were adjusted for total energy intake by regressing the transformed variable on total energy intake as described elsewhere by Willet (1998).

Parental feeding style questionnaire

A first version of the parental feeding style questionnaire was developed considering parental styles proposed by previous

literature (Caccialanza et al., 2004; Faith et al., 2004; Hughes, Power, Fisher, Mueller, & Nicklas, 2003; Kremers, Brug, de Vries, & Engels, 2003; Spruijt-Metz, Lindquist, Birch, Fisher, & Goran, 2002; Wardle, Sanderson, Guthrie, Rapoport, & Plomin, 2002). This first 31 item-questionnaire was pre-tested on a group of 25 parents of adolescents (mainly mothers) using focus groups and individual interviews; with the help of parents' observations, notes were made to add or modify items in order to reflect feeding practices pertinent to Costa Rican adolescents, such as the use of verbal sanctions as control to promote eating ("I scold my teenager if s/he refuses to try new healthy foods"). Items that reflect the distinction between control at home ("At home, I decide the times when my adolescent children eat their meals") and control away-from-home ("When we go out, I decide when it is time for my adolescent children to have a snack") were also developed in this process with the parents. A total of fourteen items were added to the first version of the parental feeding questionnaire to thoroughly reflect the feeding practices or tendencies specific to Costa Rica.

The final questionnaire had 45 items; these were classified in four theoretical feeding styles that the authors derived from the literature review, emotional feeding (the use of food to regulate emotions and behavior); instrumental feeding (the use of food as reward for good behavior); encouragement of healthy foods; and control over eating (the use of control to regulate the access to and the intake of food). Of the 45 items, 6 items reflect parental tendencies that allow adolescent children freedom and autonomy in eating, even when it is "unhealthy" or "junk" food (i.e. "At home, I allow my adolescent children to choose the foods they want to eat"). Eight items reflect parental control over access to and intake of food (i.e. "I decide what my child eats between meals"). Five items reflect parental tendencies to use food to regulate children's emotional states (i.e. "I give my adolescent children something to eat to make them feel better when they are stressed or worried"). Four items measure the use of food as reward for good behavior (i.e. "I reward my child with something to eat when s/he is well behaved"). Six items reflect the use of verbal sanctions as a way to control the increase in the intake of healthy food and healthy eating behaviors (i.e. "I scold my adolescent children if they refuse to eat foods they had not eaten before"). The rest of the items measure strategies to promote or encourage healthy eating ("I encourage my adolescent children to taste each of the healthy foods I serve").

Parents rated their responses using a 5-point Likert scale from 0 to 4, 0 = ("never"), 1 = ("almost never"), 2 = ("sometimes"), 3 = ("almost always"), and 4 = ("always").

Questionnaire's content validity

An expert group composed of two nutritionists and two psychologists defined the content validity of the parental feeding style questionnaire. These four independent judges were asked to read the 45 items in the final questionnaire and to classify them into one of the four theoretical feeding styles, (a) encouragement healthy eating behaviors, (b) emotional feeding, (c) control feeding and, (d) instrumental feeding. The authors first used a Cohen's Kappa measure to calculate the inter-rater agreement of each judge with the intended classification of the items. Then a Cohen's Kappa for multiple raters was used to examine agreement across judges and to determine content validity.

Questionnaire construct validity

Initially, the authors examined the structure of the questionnaire using exploratory factor analyses. To do this, the Kaiser–

Meyer–Olkin-measure was employed first to examine the adequacy of the data for factor analysis, and then the Principal Factors Extraction method and the VARIMAX method for rotation were used for the extraction of the components.

Secondly, in order to determine whether general or separate factor structures explained better the covariance of the data, the authors used the structural equation program EQS, version 6.1 (Bentler, 1992) to conduct confirmatory factor analyses. To estimate the covariance matrix of the data, two competing models were tested. Model 1 assumes that item co-variance is explained by their regression on one factor, and therefore, that items are best represented as a measure of a general feeding strategy. Model 2 assumes that co-variance of each set of items is fully and exclusively explained by their regression on different factors. Parameter estimates were calculated using the Maximum Likelihood method. Authors evaluated the fit of the model using the conventional criteria, the chi-square goodness of fit statistic (χ^2), the chi-square/degrees of freedom ratio ($\chi^2/\text{d.f.}$), the comparative fit index (CFI) and the root mean square error of approximation (RMSEA). A model is said to fit the data well if (a) the $\chi^2/\text{d.f.}$ is small (with values below 3.0), (b) the CFI values are above 0.90, and (c) RMSEA values are below to 0.05 (Maruyama, 1998). The chi-square (χ^2) divided by the degrees of freedom (d.f.) tends to be a less biased index of fit than the chi-square statistic itself, because the latter is highly influenced by sample size (Maruyama, 1998) (for instance, when large samples are used, the likelihood of obtaining a significant chi-square value is larger, even when the misfit of the model might be small). Chi-square statistic was hence used in this study more as a guideline than a rule.

Questionnaire reliability

Two different times of completion (T1 and T2 – with a delay of 2 weeks between completions) were compared. The reliability of the questionnaire was determined using the test (T1)–retest (T2) method using Pearson's product-moment correlations. The authors also assessed internal consistency by means of Cronbach's Alfas and item-total correlations. In addition, data were screened for normal distribution using the Kolmogorov–Smirnov test ($p < 0.05$).

Comparison of parental feeding styles by area and gender

Authors used a within-subjects ANOVA test for significant differences across the parental feeding styles, and a MANOVA test to identify significant differences in parental styles by area of residence of the families and by the gender of their children. Bonferroni post hoc test was used to determine which feeding style is more frequently used for the parents to encourage healthy eating habits among their adolescent children.

Correlates of the questionnaire with socio-demographic and dietary variables

Simple correlations between the questionnaire and metric socio-demographic data of the families, adolescents' age, BMI; dietary intake and consumption of selected food groups were calculated in order to explore associations between parental feeding styles and various variables (such as the social background of the families, children's demographic characteristics, and dietary behaviors). Correlations were calculated separately for boy and girls to test for potential moderator effects. Statistical analyses were performed using the Statistical Package for Social Sciences (SPSS Inc., version 15.0 for Windows, Chicago, Illinois) and Structural Equations Modeling Software (Bentler, 1992).

Table 1
General characteristics and dietary intake of the studied population^{a,b}.

Parameter	Value
Age (years)	15.4 ± 1.6
BMI (kg/m ²)	22.6 ± 3.1
Fathers' education (y)	
≤6	8%
7–11	57%
≥12	35%
Mothers' education (y)	
≤6	9%
7–11	62%
≥12	29%
Milk (g/d)	259.9 ± 78.9
Eggs (g/d)	21.1 ± 5.3
Poultry (g/d)	33.3 ± 3.9
Meat (g/d)	52.7 ± 7.7
Fish (g/d)	12.2 ± 3.6
Legumes (g/d)	23.3 ± 6.3
Vegetable (g/d)	109.8 ± 12.7
Fruits (g/d)	175.8 ± 16.7
Soybean oil (g/d)	15.1 ± 2.3
Palm oil (g/d)	2.9 ± 0.7
Bakery (g/d)	32.8 ± 5.6
Fast foods (g/d)	98.7 ± 8.4
Energy intake (kcal/d)	2254.1 ± 225
Carbohydrate (g/d)	153.4 ± 23.9
Protein (g/d)	35.3 ± 5.8
Total fat (g/d)	29.2 ± 2.1
Saturated fat (g/d)	8.8 ± 3.2
Monounsaturated fat (g/d)	11.9 ± 2.4
Polyunsaturated fat (g/d)	5.6 ± 1.2
Dietary fiber (g/d)	5.6 ± 2.1
Calcium (mg/d)	376.9 ± 75.6
Cholesterol (g/d)	108.1 ± 10.3
Iron (mg/d)	8.5 ± 2.5
Folate (mg/d)	256.5 ± 31.6
Vitamin B6 (mg/d)	0.69 ± 0.07
Vitamin B12 (mg/d)	1.68 ± 0.93
Zinc (mg/d)	3.6 ± 1.2

^a Values are means ± SD, g = grams, mg, milligrams.

^b Dietary nutrients and food groups are adjusted for total energy intake.

Results

Of the 150 selected adolescents, those whose parents did not provide written consent to participate in the study were excluded ($n = 17$). The final sample of 133 adolescents consisted of 64 boys and 69 girls, aged 14–18. The general characteristics of the studied population are shown in Table 1. Ninety-five percent of all parents consented to participate in the study; of them, 99% were mothers.

Questionnaire's content validity

As mentioned previously, the Cohen's Kappa for multiple raters was calculated in order to examine agreement across four independent judges (Table 2). The Cohen's Kappa for the agreement between each judge and the authors' items classification on the respective style ranged from 0.60 to 1.00, $p < 0.001$. The measure of agreement across judges was 0.65, $p < 0.001$.

Table 2

Cohen's Kappa for the agreement between each judge and the authors' items classification on the respective parental feeding style.

Judge	Emotional feeding style	Instrumental feeding style	Control feeding style	Encouragement healthy eating behaviors style	Kappa
1	100%	100%	100%	100%	1 [*]
2	100%	100%	92%	86%	.86 [*]
3	100%	100%	93%	43%	.60 [*]
4	80%	75%	92%	64%	.62 [*]

^{*} $p < 0.001$.

A Cohen's Kappa score of 0.60–0.75 has been previously suggested to qualify as a 'good score', with 0.40–0.60 qualifying as 'fair' and above 0.75 as 'excellent' (Reis & Judd, 2000). Therefore, the results provide good support for the content validity of the questionnaire. The inspection of the data shows that judges tended to 'confuse' items that measured 'control over eating' with items that intended to measure 'encouragement'. This is not surprising, since both styles have the common element of promoting healthy eating behaviors in adolescent children. Nevertheless, the authors reviewed and corrected the wording of these items in order to better differentiate both styles.

Questionnaire construct validity

Questionnaire structure

The Kaiser–Meyer–Olkin-measure of sampling adequacy yielded a score of 0.80, supporting the adequacy of the data for factor analysis. However, an inspection of initial statistics revealed communalities lower than 0.18 for two items—these two items were therefore removed from the subsequent analyses.

Using the principal component extraction method with Varimax rotation, a first exploratory factor analysis on the 43 remaining items, revealed 11 factors with Eigenvalues > 1 ; this explained 69% of the variance. The 11-factor solution was not easily interpretable and the scree plot showed a clear bend after the fourth factor, indicating that the instrument had no more than four optimal dimensions. A further factor analysis that constrained the number of factors to four, yielded a theoretical meaningful structure comprising of four components that explained 50% of the total variance (Table 3).

The first factor, with an Eigenvalue of 10.94, explained the 25% of the total variance and included items that described practices such as praising adolescents when they eat healthy foods, promoting children's intake of diverse types of food, and preparing appealing healthy food, among others (i.e. "I congratulated my children when they eat new healthy foods". Factor-loadings of these items ranged from 0.37 to 0.77 according to Comrey and Lees's guidelines (Comrey & Lee, 1992), the overall factor-loadings were considered as 'very good'). The second factor, with an Eigenvalue of 4.39, explained 10.22% of the total variance and included items that described the use of verbal sanctions to promote healthy food intake (for example, "I scold my adolescent children when they refuse to try healthy foods they have da Veiga and Sichieri (2006). da Veiga and Sichieri (2006). never tried before"). The factor-loadings ranged from 0.64 to 0.88, considered as 'very good' according to Comrey and Lees's guidelines (Comrey & Lee, 1992).

The third factor had an Eigenvalue of 3.28, and explained 7.63% of the variance. It contained items that measured both instrumental eating items and emotional eating items such as "When my adolescent children are worried or stressed, I give them food to make them feel better". Factor-loadings ranged from 0.43 to 0.80, considered as 'very good' according to Comrey and Lees's guidelines (Comrey & Lee, 1992).

The fourth factor had an Eigenvalue of 2.94, explained around 7% of the variance; it comprised items that reflected restriction and

Table 3
Results of exploratory factor analysis.

	Components			
	1	2	3	4
Eigen value	10.94	4.39	3.28	2.94
Explained variant	25%	10.22%	7.63%	6.83%
Item description (abbreviated wording)				
Item_33 I congratulate my adolescent children when they eat new healthy foods	0.77			
Item_38 I congratulate my adolescent children when they eat healthy foods	0.77			
Item_23 I encourage my adolescent children to enjoy healthy foods	0.75			
Item_12 I encourage my adolescent children to eat a wide variety of foods	0.74			
Item_34 I encourage my adolescent children to eat healthy foods	0.73			
Item_44 I encourage my adolescent children to try all the healthy foods I prepare for them	0.68			
Item_26 I encourage my adolescent children to try healthy foods they have never tried before	0.67			
Item_3 I encourage my adolescent children to enjoy food	0.65			
Item_1 I congratulate my adolescent children when they eat healthy foods	0.62			
Item_18 I encourage my adolescent children to try foods they have never tried before	0.60			
Item_15 I encourage my adolescent children to try every single food item I prepare for them	0.59			
Item_29 I congratulate my adolescent children when they eat what I prepare for them	0.58		0.37	
Item_9 I try to present food in attractive ways to my adolescent children	0.51			
Item_16 At home, I insist that the entire family sits at the table to eat together	0.44			
Item_21 I make sure that my adolescent children look forward to every meal	0.37		0.36	
Item_39 I scold my adolescent children when they refuse to try healthy foods they have never tried before		0.88		
Item_42 I scold my adolescent children when they refuse to eat new foods		0.87		
Item_20 I scold my adolescent children when they refuse to try all the healthy foods I prepare for them		0.81		
Item_27 I scold my adolescent children when they refuse to try every single food item I prepare for them		0.78		
Item_4 I scold my adolescent children when they refuse to try foods they have never tried before		0.71		
Item_10 I scold my adolescent children when they do not eat the foods I prepare for them		0.70		
Item_45 I scold my adolescent children when they refuse to eat new healthy foods		0.69		
Item_13 I scold my adolescent children when they do not eat healthy foods		0.64		
Item_40 When my adolescent children are upset, I give them food to make them feel better			0.80	
Item_37 When my adolescent children are worried or stressed, I give them food to make them feel better			0.79	
Item_24 When my adolescent children are bored, I give them food			0.70	
Item_41 When my adolescent children behave properly, I reward them with food			0.67	
Item_7 I reward my adolescent children with food so that they will behave properly			0.64	
Item_5 When my adolescent children are angry, I give them food to make them feel better			0.62	
Item_19 When my adolescent children are sad, I give them food to make them feel better			0.62	
Item_31 I reward my adolescent children with a special treat after each meal			0.53	
Item_28 At home, I let my adolescent children eat junk food and decide how much is enough			0.43	-0.42
Item_32 At home, I decide how much junk food my adolescent children can eat				0.69
Item_36 When we go out, I decide when my adolescent children can eat junk food				0.68
Item_2 At home, I decide when my adolescent children can eat junk food				0.65
Item_43 When we go out, I decide at what time my adolescent children must have their meals				0.61
Item_6 When we go out, I decide how much junk food my adolescent children can eat				0.58
Item_30 I decide what my adolescent children can eat in between meals				0.56
Item_11 At home, I let my adolescent children eat whenever they please in between meals ^a				-0.54
Item_35 At home, I decide at what time my adolescent children must have their meals		0.34		0.46
Item_25 When we go out, I let my adolescent children eat junk food and decide how much is enough ^a			0.34	-0.45
Item_22 I let my adolescent children decide at what time they want to eat ^a				-0.44
Item_17 I let my adolescent children eat their meals anywhere in the house ^a				-0.40

Factor 1 = encouragement of healthy eating behaviors, Factor 2 = verbal sanction, Factor 3 = instrumental/emotional feeding, Factor 4 = control over eating. Only factors loadings above 0.30 are presented.

^a Reversed item.

control over eating at home and away-from-home. It also included reversed items of the control style; for example, items that reflected freedom and autonomy of children in regard to food access and intake. Factor-loadings for the control items ranged from 0.40 to 0.69. These results are considered as good according to Comrey and Lees's guidelines (Comrey & Lee, 1992).

Emergent parental feeding styles

The preliminary results from factor analyses revealed four distinct parental feeding styles toward adolescents, (a) the tendency to encourage healthy eating behaviors, (b) the use of verbal sanctions in order to promote the intake of healthy food, (c) the use of food as means of regulating emotions and behaviors, and (d) control over access to and intake of food. Preliminary results show the presence of a strong first factor that accounts for 25% of the total variance, meanwhile the other factors appeared to explain only a small percentage (<10%).

This strong presence of the first factor, in comparison to the remaining three factors, raises the question of whether the items

measure a general factor of parental feeding practices, instead of four different styles. To address this, the authors tested two competing models using confirmatory factor analyses (Bentler, 1992).

In order to clarify the multidimensional structure of the above mentioned two competing models, the fit indices for each model were evaluated. Results indicated that neither model 1 nor model 2 fit the data well. However, the chi-square difference test indicated that the four-factor model (model 2) was significantly superior in fit than model 1, providing further support for the four dimensional structure ($\Delta\chi^2(88) = 1061.74, p < 0.001$) (Table 4).

Questionnaire reliability

Internal consistency

Psychometric data of the four factors emerging parental feeding styles, are presented in Table 5. Analyses for the 15 items in the first factor, style (a) 'encouraging healthy eating behaviors' and the eight items that measured the second factor, style (b) 'verbal

Table 4
Fit indices for two competing models of the factorial structure of the measure.

Model	Indices	Statistics
1 (One-factor-model)	CFI	0.39
	RMSEA	0.12
	χ^2	2.401.335
2 (Four-factor-model)	CFI	0.75
	RMSEA	0.08
	χ^2	1.339.604
	$\Delta\chi^2(88)$ (against previous model)	1061.74***

*** $p < 0.001$.

sanction' yielded a very high internal consistency coefficient (Cronbach's alpha of 0.92 and 0.91, respectively). The ratio of corrected item-total correlations in both emergent parental feeding styles had a high internal consistency (ranging from 0.47 to 0.80 for style (a) and from 0.60 to 0.85 for style (b)). For the nine items that measured the third factor, style (c) 'instrumental feeding style', reliability analyses showed a lower Cronbach's alpha (0.82); but the factor maintained a high internal consistency reliability (item total correlation ranged from 0.36 to 0.47). The 12 items measuring verbal sanction yielded high internal consistency reliability with a Cronbach's alpha of 0.83, with item-total correlations from 0.34 to 0.60.

Test–retest reliability (repeatability)

Based on the high internal consistency between the items of each feeding style, the items were used to create scales within each style. Independent scores on each parental feeding style were derived by calculating the mean of the respective items of each style. All scales have a theoretical range from 0 to 4 (due to the Likert-scale response format), with high scores indicating high levels of the constructs. Correlations between scores at test (T1) and scores at re-test (T2) were 0.75, 0.70, 0.72, and 0.65 for encouragement, verbal sanction, instrumental feeding and control over eating, respectively. Test–retest results were satisfactory and therefore support the statement that the questionnaire designed is a very reliable instrument for Costa Rican parental feeding styles assessment.

According to the one-sample test by Kolmogorov–Smirnov, the mean scores of all these scales were normally distributed ($Z_s < 1$, n.s.), with exception of the instrumental feeding scale, whose scores were positively skewed (skewness = 1.11, Kolmogorov–Smirnov $Z = 2.01$, $p < 0.01$).

Comparison across feeding styles

A within-subjects analysis of variance showed significant mean differences across styles, $F(3,358) = 142.21$, $p < 0.001$. Post hoc tests using the Bonferroni adjustment for multiple comparisons revealed that parents are more likely to encourage healthy eating behaviors in their adolescent children, and are less likely to use food for regulating children emotions and behaviors. The use of

verbal sanctions and of control over eating fall in the middle (all $p < 0.05$).

Socioeconomic background of the families and parental feeding styles

The zero-order correlations between the parental feeding styles, and parental educational levels and socioeconomic status (SES) are presented in Table 6. Means and standard deviations for the MANOVA are presented in Table 7.

The correlation matrix shows a small, but significant, association between mothers' educational level and the tendency to encourage healthy eating behaviors ($r = 0.19$, $p < 0.05$). This suggests that mothers with higher levels of formal education tend to encourage healthy eating behaviors in their adolescent children more strongly than mothers with lower levels of formal education.

Results from MANOVA revealed a significant multivariate effect for area of residence (rural vs urban, Wilks' lambda $F(4,119) = 2.93$, $p = 0.024$, $\eta^2 = 0.09$). At the univariate level, area of residence appeared to be associated with control over eating, ($F(1,122) = 5.69$, $p = 0.019$, $\eta^2 = 0.05$), parents from urban areas tend to exercise more control over the access and the intake of food of their adolescent children ($M = 1.75$) than parents from rural areas ($M = 1.40$).

Parental feeding styles and adolescents's characteristics and dietary intake

The zero-order correlations between the parental feeding styles, adolescents' Body Mass Index, gender, and dietary intake are presented in Table 6. Means and standard deviations for MANOVA are presented in Table 7.

There were no significant correlations between parental styles and age of their children. There were also no significant correlations between parental feeding styles and anthropometric characteristics of the adolescents. Results from MANOVA revealed neither a significant multivariate effect for gender of the children (Wilks' lambda $F[4,119] = 1.14$, $p = 0.343$, $\eta^2 = 0.04$) nor a significant multivariate interaction between area of residence and gender (Wilks' lambda $F[4,119] = 1.06$, $p = 0.379$, $\eta^2 = 0.03$).

However, there were significant correlations between parental feeding styles and particular aspects of children's consumption of food and nutrient intake. Overall, no positive correlations were found between dietary intake and the style that tended to encourage healthy eating, interestingly, folic acid intake was negatively correlated with tendency to encourage healthy eating behaviors. Significant negative correlations were also found between fruit and vegetable consumption and the parental style that used verbal sanctions to encourage healthy eating, adolescent children whose parents reported to use verbal sanctions more frequently, tended to consume less fruits and vegetables compared to those whose parents used this strategy less frequently. Significant negative correlations were found between the parental style that uses control over eating and children's intake of fast food, carbohydrates, iron, vitamin B6, and folic acid as well, adolescent

Table 5
Means, standard deviations, item total correlations, Cronbach's Alfas, and test–retest correlations of the measures.

Measure	Items	Psychometric statistics				Test–retest r_s
		M	S	α	g_1	
Encouragement of healthy eating behaviors	15	2.66 ^a	0.97	0.92	–0.622	0.75
Verbal sanction	8	1.88 ^b	1.18	0.91	0.130	0.70
Control over eating behaviors	9	1.58 ^c	0.81	0.83	1.106	0.72
Instrumental/emotional feeding	12	0.75 ^d	0.69	0.82	0.228	0.65

¹Min = 0, Max = 4, high scores indicate high levels in each construct. Means not sharing a superscript differ at $p < 0.05$ according to post hoc tests using Bonferroni adjustment for multiple comparisons.

Table 6

Simple correlations between the four feeding styles, family socioeconomic and educational background, and children's socio-demographic characteristics and dietary intake for the total sample ($n = 126$), and for boys ($n = 59$) and girls ($n = 67$), respectively.

Measures	Encouragement of healthy eating			Verbal sanction			Control over eating			Instrumental/emotional feeding		
	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls
Fathers' educational level	0.112	0.198	0.057	-0.003	0.180	-0.162	-0.019	-0.267*	0.074	-0.053	0.062	-0.078
Mothers' educational level	0.189*	0.179	0.136	0.085	0.063	0.052	0.105	-0.117	0.219	0.085	0.099	0.034
Parents' SES	0.167	0.170	0.056	0.044	0.003	0.048	-0.013	0.051	0.105	0.116	-0.078	-0.018
Children's BMI	-0.048	0.169	-0.112	0.085	-0.001	-0.018	-0.052	0.165	-0.096	-0.022	0.115	-0.124
Children's intake of fruits	-0.049	-0.048	0.013	-0.247*	-0.257	-0.119	-0.161	-0.341**	0.003	0.073	0.079	0.118
Children's intake of vegetables	-0.121	-0.110	-0.076	-0.194*	-0.225	-0.118	-0.152	-0.149	-0.198	0.044	-0.055	0.162
Children's intake of meat	0.021	-0.064	0.086	0.050	-0.023	0.051	0.012	-0.116	0.082	0.010	-0.070	0.016
Children's intake of milk	-0.113	-0.112	-0.055	0.049	-0.266*	0.173	-0.151	-0.235	-0.040	-0.111	0.097	-0.137
Children's intake of leguminous	-0.015	-0.066	0.016	-0.002	0.111	-0.062	-0.050	-0.228	0.002	0.202	0.083	0.205
Children's intake of fast food	-0.127	-0.096	-0.129	-0.060	-0.097	0.054	-0.305**	-0.220	-0.082	0.285*	0.255	0.293*
Children's intake of proteins	-0.144	-0.154	-0.032	-0.106	-0.275*	0.036	-0.209	-0.197	-0.062	0.115	0.161	0.064
Children's intake of carbohydrates	-0.176	-0.223	-0.050	-0.106	-0.184	-0.001	-0.240*	-0.233	-0.085	0.074	0.031	0.064
Children's intake of fat	-0.224	-0.155	-0.075	-0.135	-0.153	-0.005	-0.175	-0.160	0.020	0.062	-0.001	0.221
Children's intake of saturated fat	-0.199	-0.113	-0.055	-0.095	-0.103	0.059	-0.146	-0.142	0.099	0.081	0.043	0.183
Children's intake of polyunsaturated fat	-0.187	-0.196	-0.020	-0.111	-0.176	-0.011	-0.161	-0.210	0.030	0.017	-0.068	0.207
Children's intake of fiber	-0.071	-0.114	0.022	-0.134	-0.210	-0.069	-0.150	-0.229	0.055	0.154	0.079	0.146
Children's intake of calcium	-0.138	-0.126	-0.088	0.019	-0.302*	0.111	-0.158	-0.156	-0.065	-0.008	0.174	-0.048
Children's intake of iron	-0.173	-0.205	-0.052	-0.050	-0.286*	0.026	-0.298**	-0.231	-0.163	0.036	0.000	0.030
Children's intake of zinc	-0.191	-0.154	-0.114	-0.082	-0.200	-0.013	-0.201	-0.224	-0.054	0.065	0.053	0.001
Children's intake of vitamin B6	-0.187	-0.169	-0.008	-0.220	-0.304*	-0.088	-0.256*	-0.225	-0.087	-0.029	0.007	0.046
Children's intake of vitamin B12	0.112	-0.087	0.149	0.212	-0.112	0.226	0.031	-0.194	0.088	0.004	0.192	-0.089
Children's intake of folic acid	-0.221	-0.257*	-0.136	-0.088	-0.228	-0.062	-0.262*	-0.229	-0.175	0.054	0.010	-0.015

Note. Ns vary due to missing values (max. missing values < 5%).

* $p < 0.05$.

** $p < 0.01$.

children from parents, who tend to exercise more control over their access to and their intake of food consume less fast food, carbohydrates, but also less iron, vitamin B6 and folic acid than children from parents who exercise less control over their eating habits.

In addition, when the pattern of correlations for all parental feeding styles was examined separately for boy and girls, data show different results based on gender. Among boys, the use of verbal sanction by parents correlated negatively with milk consumption, while among girls, this correlation was positive, although not significant. The test for difference between two correlations indicates that the difference across correlations is statistically significant ($Z = 2.45, p < 0.05$). A similar pattern was found in the relation of the verbal sanction style and intake of proteins, calcium, and iron. While among the boys, the verbal sanction style was significantly associated with less consumption of proteins, calcium and iron, among the girls this association was reversed, or at least absent. In these cases, however, the tests for the difference between these correlations were only statistically marginal (all $Z_s < 1.92, p < 0.07$). The parental use of control strategies was negatively associated with consumption among boys, but not girls; the difference between these correlations was

significant. The data also revealed a positive correlation between the style that depicts instrumental/emotional eating and adolescent girls' actual consumption of fast food.

Discussion

This is the first effort to design and validate a questionnaire specifically to assess the influence of parental feeding styles on the adoption of healthy eating habits among adolescents (aged 13–18 years), especially those living in under-developed countries where the relationship between adolescents and parents can be very different from those in developed countries. Previous questionnaires, such as the Comprehensive Feeding Practices Questionnaire (Musher-Eizenman & Holub, 2007), the Parental Feeding Style Questionnaire (Wardle et al., 2002), and the Child Feeding Questionnaire (Birch et al., 2001) have offered good factorial validity and reliability to measure parental feeding styles, but they were designed to assess only parental perceptions and concerns regarding childhood obesity, and were exclusively validated on children aged 5–12 years. To our knowledge, no previous questionnaire has tried to assess parental feeding styles in a Latin American country.

Table 7

Means, standard deviations of feeding styles by area of residence of the families and sex of the children^a.

Study population	Encouragement of healthy eating		Verbal sanction		Control over eating behaviors		Instrumental/emotional feeding	
	M	SD	M	SD	M	SD	M	SD
Urban	2.69	0.88	1.94	1.18	1.75	0.80	0.69	0.58
Boys	2.78	0.90	1.96	1.23	1.73	0.77	0.73	0.61
Girls	2.60	0.87	1.93	1.14	1.78	0.84	0.65	0.56
Rural	2.74	0.99	1.91	1.13	1.40	0.77	0.90	0.80
Boys	2.91	1.02	1.84	1.09	1.64	0.83	1.03	0.94
Girls	2.59	0.95	1.97	1.19	1.19	0.67	0.80	0.64
Total	2.71	0.92	1.93	1.16	1.61	0.80	0.78	0.69

^a High scores indicate high levels in each construct.

It has been previously suggested that parents in Latin American cultures may have a greater influence on the eating habits of their adolescent children, as compared to parents in European or North American cultures (Santisteban, Muir-Malcom, Mitrani, & Szapocznik, 2002). Latin-American cultures appears to associate personal achievement with any service rendered towards the well-being of the family; in contrast, European and North American cultures tend to value the pursuit of individualistic goals personal ambition and autonomy (Santisteban et al., 2002). Furthermore, Latin-American families are thought to emphasize conservative and traditional views on family life that strengthen family solidarity, mutual obligations, and reciprocal support (Cauce & Domenech-Rodríguez, 2002). Understanding parental feeding styles in a Latin American context might help researchers to develop culturally-appropriate parenting intervention/prevention strategies to encourage healthy eating behaviors during adolescence.

The current study examined the reliability, validity and correlates of a questionnaire intended to identify parental influence on adolescent eating behaviors in Costa Rica. Results from the current study suggest that Costa Rican parents tend to either feed their adolescent children or influence their eating in a multi-dimensional process that is comprised of four distinct styles, (a) the tendency to encourage healthy eating behaviors, (b) the use of verbal sanctions to promote the intake of healthy food (indirect way), (c) the control of access to and intake of food (direct way), and (d) the use of food to regulate emotions and behavior.

The ratio of participants per survey item in our study is smaller than the 5:1 recommended for tool development (Hatcher, 1994), having only 133 participants for the 45-item questionnaire. However, our data offers strong evidence of the multidimensionality of the construct, given the presence of high communalities without cross loadings. As Costello and Osborne (2005) noted, “strong data” in factor analysis means uniformly high communalities without cross loadings, plus several variables loading strongly on each factor.

Additionally, confirmatory factor analyses support the multidimensional structure of the construct. Data show that a four-dimensional structure fits the empirical co-variation of the items significantly better than a one-dimensional solution. The following paragraphs discuss briefly each one of the emerging feeding styles and their correlations with actual eating habits of the adolescents in Costa Rica.

Style A. The tendency to encourage healthy eating behaviors

According to the findings of the current study, the tendency of the parents to encourage healthy eating habits using the direct promotion of healthy foods had no effect on the quality of the adolescent diet. It seems that parental encouragement in the form of discourse on its own is not enough to produce a change in eating habits. Studies have suggested that adolescents are more influenced, by what they see others do, rather than by discourse. Several authors (Brown & Odgen, 2004; Campbell et al., 2007; Hanson, Neumark-Szteiner, Eisenberg, Story, & Wall, 2005; Pearson, Bidle, & Gorely, 2008; van der Horst, Kremers, et al., 2007; van der Horst, Oenema, et al., 2007) have previously shown that parental eating behavior is associated with adolescent intake of dairy foods, fruits, vegetables, snack foods, high energy fluids (soft drinks and fruit juice), fat and energy. Adolescents might model their parents' food intake and preferences (Birch & Fisher, 1998; Guidetti & Cavazza, 2008; Pearson et al., 2008), and also their attitudes towards food and the reasons behind their eating behaviors (Brown & Odgen, 2004; Guidetti & Cavazza, 2008; Snoek, Engels, et al., 2007; Snoek, Van Strein, et al., 2007).

Style B. The use of the direct and indirect control of access to and intake of food

Parents exerted direct influence over the access to and intake of foods among their adolescent. This may be a form of “familismo”, a cultural construct that appears to encapsulate Latin-Americans valuation of interdependence and the roles of individuals in a group context, such as family (Coohey, 2001). Similar results where Latin-American mothers exercised a high level of control over what their adolescents eat have been observed in Puerto Rico and the Dominican Republic (Guilano-Ramos et al., 2007). The use of the direct and indirect control of access to and intake of food has been reported in studies carried out in developed countries (Brown & Odgen, 2004; Stevenson, Doherty, Barnett, Muldoon, & Trew, 2007; van der Horst, Kremers, et al., 2007; van der Horst, Oenema, et al., 2007) and in minority groups living in these countries (Arredondo et al., 2006; Varela et al., 2004). But, the degree of parental control over feeding depends of cultural differences among parents and by their nutritional goals for their children (Varela et al., 2004).

The findings of this study show that parental control feeding style, have mixed effects on adolescents' dietary intake. On one hand, the use of verbal sanctions (indirect control) showed a decreased intake of healthy foods and related essential nutrients like calcium, iron and vitamin B6. On the other hand, the control of access to and intake to (direct control) was positively correlated with a decreased intake of fast foods and total carbohydrate intake. These mixed findings could be explained by the different forms of control that act differently on eating behaviors (Ogden, Reynolds, & Smith, 2006). For instance, the use of indirect control may result in the adolescents' rejection of imposed adult authority (Bassett, Chapman, & Beagen, 2008). In a recent study among Costa Rican teens, Monge-Rojas, Garita, Sánchez, and Muñoz (2005) proposed that adolescents are intent on establishing eating habits detached from those often linked to the adult world. It is worth mentioning that 64% of the sample in the current study was comprised by teens in mid-adolescence (14–16 years of age), a period when the adolescent's most intense negotiations regarding autonomy and independence take place (Coleman & Hendry, 2003).

In addition, the use of direct control or parental restriction over access to fast foods and junk foods could result in decreased intake of the same. In Costa Rica, parents still play the role of providers during the adolescent years, and as such they can indirectly modulate the adolescents' chance of eating unhealthy products. Parents have the potential to influence their adolescent's food intake through the food environment that they provide at home (Arcan et al., 2007). Some studies have reported that home availability of unhealthy food is associated with higher fat intakes (Haerens et al., 2007) and with the consumption of high-energy drinks, sweet and savory snacks (Campbell et al., 2007; Grimm, Harnack, & Story, 2004). According to a study by Haerens et al. (2007), decreasing the availability of unhealthy products may be an effective approach for changing eating behaviors among adolescents.

An interesting observation from the results of the current study is the gender-specific differences between parental control feeding styles and actual diet behaviors. Consistent with previous studies, our findings show that parental control feeding styles tend to have a more deleterious effect on the diet quality of boys than of girls. Cohen and colleagues suggested that even at a young age, girls seem to be socialized differently regarding food than boys (Cohen, Brownell, & Felix, 1990). It is possible that adolescent boys perceive higher restrictions and obligations to stress their autonomy than girls do, due to the social pressure that directs the construction of their masculinity (Garita, 2001). In contrast, direct control over eating is more readily accepted by girls, since it could be regarded as a strategy to decrease energy consumption (Francis & Birch,

2005). This facilitates body image care and reduces preoccupation with body weight and shape, which concurs with social demands for the construction of femininity (Leavy, Gngong, & Ross, 2009; Sweeting, 2008). Additional research is needed to examine factors such as the parental extrapolation of weight concerns within mother–daughter and father–son relationships. This may help explain the differences between boys and girls in the correlates of parental control feeding styles and dietary intakes.

Style C. The use of food to regulate emotions and behavior

The results suggest a moderate positive correlation between the use of food to regulate emotions and behaviors and fast food intake, mainly in girls. This data is in line with some (Nguyen-Mitchell et al., 2007; Steinegger, 2005) but not all (de Lauzon et al., 2004; Lluch, Herberth, Méjean, & Siest, 2000; Snoek, Engels, et al., 2007; Snoek, Van Strein, et al., 2007), literature that reported a preference for high energy-dense food in adolescent emotional eating. Current literature offers few insights about potential motives to explain why parental emotional feeding style is not constantly associated with adolescents' consumption of high energy foods. Oliver, Wardle, and Gibson (2000), have suggest that a stressor is necessary to prompt emotional eaters to consume energy-dense foods that are high in sugar and fat content. On the other hand, Wardle et al. (2002) have suggested that emotional feeding styles may reflect the mother's tendency to treat her children as she treats herself. The children of mothers who are emotional eaters may be more inclined to want to eat when emotionally distressed; resembling their mother's eating style (Francis & Birch, 2005; Wardle et al., 2002). Further research is necessary to explain the correlates of Costa Rican adolescent dietary intakes (mainly among girls) and the parental emotional feeding style.

Emotional feeding styles have been associated with an increased risk of overweight, since they amplify the association of eating in response to cues outside the body. In Latin-American cultures, mothers often bear responsibility as the primary source of care for the entire family (Guilano-Ramos et al., 2007) and there is a specific tendency to associate food with affection (Gomel & Zamora, 2007). This study suggests that parental emotional feeding style might influence adolescents' dietary intake, particularly in girls, who are at higher risk of obesity. Previous studies have suggested that parents who recur to emotional cues to encourage or control food intake may actually act as a precursor to overweight (Birch & Fisher, 1998; Nguyen-Mitchell et al., 2007). These may be the first data to explore adolescent dietary behavior associated with a parental feeding style in Costa Rica.

Limitations and conclusions

The results of this study contribute significantly to the literature regarding factors that influence parental feeding styles on adolescent eating habits in the context of a Latin American country. Nonetheless, the following limitations are noted. First, the sample only included adolescents enrolled in school; therefore, those not participating in the educational system for social or economic reasons were excluded. Currently, around 25% of the adolescents' population is not enrolled in the school system (Programa Estado del la Nación en Desarrollo Sostenible, 2008), consequently the results obtained cannot be generalized for all Costa Rican adolescents' population. Second, mostly mothers completed the questionnaire; therefore, excluding any potential influence from the father. While the literature indicates that mothers have a much larger impact on their children's eating habits (Campbell et al., 2007; Hannon, Bowen, Moinpour, & McLerran, 2003; Hanson et al., 2005), recent studies suggest that

fathers play a very important role in the formation of adolescent eating behaviors (Snoek, Engels, et al., 2007; Snoek, Van Strein, et al., 2007). It would be important to investigate whether this is also the case for families and fathers living in Costa Rica. Third, parental feeding styles were studied in isolation from the family environment where they were exercised; this limits the interpretation of the results because the adolescents' perception of and reaction to a particular feeding style varies depending on where it is expressed (Rhee, 2008). It has been noted previously that when a parental control feeding style is exercised in an atmosphere of involvement and parental warmth, it may lead to positive effects in dietary intake, while the same parental feeding style may lead to adverse effects in an authoritarian atmosphere where parents are stricter but less involved (van der Horst, Kremers, et al., 2007; van der Horst, Oenema, et al., 2007). Finally, the study is limited by its sample size; therefore, our results should be interpreted with caution—in particular the results on the moderation effects of gender on the relationship between feeding styles and adolescents' dietary intake. In order to detect a difference of 0.30 (using bivariate correlations of two-tailed $\alpha = 0.05$) with 80% power (Bausell & Li, 2005) the study would require 76 boys and 76 girls (whereas we were only able to include 59 boys and 67 girls), suggesting that a small increase of sample size will give the tests a fair chance to detect a real or non trivial statistical effect.

Notwithstanding the above limitations, the study presents an initial approach to identifying the ways in which parents develop and act to promote a healthy diet among their adolescent children in a Latin American social environment. As suggested in this study, any health promotion programs geared towards the development of healthy eating behaviors among adolescents should involve parents as agents of change. These programs could benefit from the inclusion of guidelines on alternative parental feeding styles, which can effectively promote healthy eating habits in the household environment without the risk of thwarting the independence and emotional autonomy that is distinctive of adolescence.

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