

## **Adolescents' Food Preferences in China: Do Household Living Arrangements Matter?**

SUO DENG, PhD

*Center for Social Development, George Warren Brown School of Social Work, Washington  
University in St. Louis, St. Louis, Missouri, USA*

*Family circumstance has long been considered one important factor that shapes children's eating habits including preferences for particular foods. However, less scholarly efforts have been devoted to understanding children's food preferences in extended family households. Drawn on data from the China Health and Nutrition Survey (CHNS) 2006 (n = 662), this exploratory study compares food preferences of adolescents living in extended families with those residing in nuclear families. T-test results show that adolescents living in extended families (n = 202) had unhealthier food preferences compared with those living in nuclear families (n = 460). They showed more liking for fast food, salted snack food, and sugared drinks, and less liking for vegetables and fruits. Regression results present that controlling for other relevant variables, household structure was significantly associated with adolescents' food preferences ( $p < .01$ ). These results, albeit exploratory, shed light on possible nutritional education and intervention in the cultural context of China.*

**KEYWORDS** *food preferences, nuclear family, extended family*

---

Received February 16, 2011; accepted May 16, 2011.

The author thanks the China Health and Nutrition Survey (CHNS), funded by NIH (National Institutes of Health) (R01-HD30880, DK056350, and R01-HD38700), and the Carolina Population Center and the Chinese CDC (Center for Disease Control and Prevention). The author also expresses gratitude for valuable comments from anonymous reviewers.

Address correspondence to Suo Deng, PhD, Center for Social Development, George Warren Brown School of Social Work, Washington University in St. Louis, One Brookings Drive, Campus Box 1196, St. Louis, MO 63130. E-mail: sdeng22@wustl.edu

The transitional change of population's eating behaviors and nutritional status has been seen as a global phenomenon. Many previously lower income societies such as China, India, and some Latin-American countries, coupled with their recent economic development, are now experiencing significant changes in disease and dietary consumption (Popkin, 2001). Over the past decades, China has witnessed exponential economic growth with concomitant transition of her population's eating behaviors. The national average consumption of cereals and tubers has decreased, and in the meantime, the food consumption of animal sources has increased dramatically (Adair & Popkin, 2005; Ge, Jia, & Liu, 2007). While under-nutrition has become less visible, the rapid growth of overweight and obesity in both children and adult populations signals an increasing challenge in the food and nutrition field (Zhai et al., 2007).

Food preferences have long been recognized as one of the most important factors that help explain children's eating behaviors (Baxter & Thompson, 2002; Birch, 1979; Drewnowski, 1997). While adolescents are in the process of cognitive development, their food choices and eating patterns are closely associated with their attitudes and preferences toward foods and their knowledge about foods. They are more likely to choose foods based on whether they like or dislike particular foods rather than the food availability (Birch & Fisher, 1997).

Children's food preferences are strongly influenced by their sociodemographic characteristics, including both individual and social factors. Increasing evidence has indicated that demographic characteristics such as age and gender are associated with their present and/or subsequent eating practices (Cooke & Wardle, 2005; Lytle, Seifert, Greenstein, & Mcgovern, 2000). Additionally and more importantly, social environment, especially family circumstances, presents an influential force to shape children's food preferences (Cavanagh, 2008). A growing body of research has revealed that family environment, mainly through parental behaviors, has crucial effects on children's food preferences, and is closely associated with the incidence of obesity (Pearson, MacFarlane, Crawford, & Biddle, 2009; Savage, Fisher, & Birch, 2007; Wardle, Sanderson, Guthrie, Rapoport, & Plomin, 2002). Research also found that adolescents living in non-traditional families, such as single-parent or step-parent families, are more likely to have unhealthy eating behaviors or be overweight than those who grow up in both-parent households with either biological or step-parents (Savage et al., 2007; Stewart & Menning, 2009).

Nonetheless, little attention in the existing literature has been given to food preferences of adolescents living in extended family households, a typical mode of household structure in China as well as many other developing countries. In extended families, grandparents are usually primary caregivers of grandchildren, and they may influence children's preferences for foods through their own food choices and eating behaviors. Based on the China's Health and Nutrition Survey (CHNS) data, this study aims to

fill the research blank by exploring the relationship between household structures, including nuclear family and extended family, and adolescents' food preferences in China.

## BACKGROUND

As children's eating decisions are mostly made within the family context, family is considered the primary social mechanism that determines a variety of childhood eating practices, including a child's assessment of satiety and attitudes toward food, which may later contribute to the onset of obesity (Patrick & Nicklas, 2005).

Previous studies have demonstrated that family circumstances, in terms of household living arrangement, family-hierarchy or family-cohesion, have significant impact on the formation of both children's and parents' eating habits (Hasenboehler, Munsch, Meyer, Kappler, & Voegelé, 2009). Children who grow up in some non-traditional family households tended to have more dietary fat intake and were more likely to become obese than children living with both-parent families (Johnson-Down, O'Loughlin, Koski, & Gray-Donald, 1997; Strauss & Knight, 1999). Multiple factors pertaining to family circumstance influence a child's food preferences, including, but not limited to, household socioeconomic status, parental behavioral and psychological support, as well as children's food exposure in the family. Stewart and Menning (2009) have found that adolescents living in single-parent households had less parental monitoring of food than those who lived with two biological or adoptive parents. Parenting styles of eating behaviors, such as modeling, restricting or controlling on food choices, are found significantly associated with children's food preferences (Guidetti & Cavazza, 2008; Rozin, 1991). Nonetheless, the existing literature focuses mostly on the effects of family circumstances on children's food preferences in the western context where the nuclear family, despite its various forms, has been the dominant household structure. Relatively less attention has been given to understanding the food preferences of children who reside in extended family households.

Over the past decades, in conjunction with drastic economic and social structural transformation, China has witnessed the emergence of diverse family structures such as single-parent families, step-families, or one-couple families. However, as the divorce rate has been fairly low, it is believed that the single-parent family does not account for a significant proportion in China (Zeng, 2001). Also, the census data show that China still has a large percentage of traditional multigenerational households, especially when compared with many western countries. The percentage of multigeneration extended families in China was 19.5%, 18.7%, and 20.89% in 1982, 1990 and 2000, respectively, and the three-generation family household in 2000 in China was around 5.2 times higher than that in the United States

in the same year (Zeng & Wang, 2003). The co-residence of grandparents with their adult children and grandchildren reflects the Confucian ideal of family harmony, representing the most complete fulfillment of filial piety (Zhao, 2000). The multigenerational co-residence allows adult children to show their deference and commitment to the older parents, and meanwhile grandparents could play an important role in helping with childcare and other household affairs as a culturally expected social exchange (Chen & Silverstein, 2000; Silverstein, Cong, & Li, 2006).

Children residing in extended family households may present different eating preferences from those who grow up in nuclear families. One qualitative study conducted in Beijing shows that children tended to form unhealthy eating habits when taken care of by grandparents who might transmit their own food-related knowledge and attitudes to grandchildren (Jiang, Rosenqvist, Wang, Greiner, Lian, & Sarkadi, 2007). Nevertheless, to date, quantitative studies presenting the effect of household living arrangements on adolescents' eating choices in China are rarely seen, especially in comparing children's food preferences between children living in extended families and those in nuclear families.

As such, this study aims to assess the potential differences of children's food preferences between nuclear families and extended families, and investigating the effect of household structure on food preferences controlling for other relevant variables. Based on previous research, although very limited, it is hypothesized that adolescents living in extended families have unhealthier food preferences, as compared with those who reside in nuclear families. Implications for intervention on children's nutrition are discussed.

## METHOD

### Data

The sample in the present study was drawn from the CHNS 2006. The CHNS is an ongoing longitudinal survey that started in 1989 and covered nine provinces in China, including Heilongjiang, Liaoning, Shandong, Jiangsu, Henan, Hubei, Hunan, Guizhou, and Guangxi. The provincial selection took into consideration various indicators of geography, economic development, public resources, and health. A multistage and random cluster strategy was adopted to draw samples from each province's household numbers. Therefore, the sample is considered as representing the general population of the country. The CHNS consists of different levels of sub-datasets including the adult survey, child survey, household survey and community survey. More description of the CHNS can be found at <http://www.cpc.unc.edu/projects/china>.

The CHNS child survey data of 2006 were used for the current study. The data comprised a total of 1,954 children under 18 years old in 1,548

households. This study then selected children aged 12 to 17.99 years, which narrowed the sample size to 662. The household roster in the survey collected information on each participant's relationship to the household head, which helped distinguish the number of generations within a household and generational relationship. We then were able to determine two types of household living arrangements measured by household structure—the nuclear family ( $n = 460$ ) and the extended family ( $n = 202$ ).

## Variables

### FOOD PREFERENCES

Adolescents' food preferences were measured by a 5-item Likert-style scale and treated as a dependent variable in the regression model. Participants chose their degree of liking or disliking toward five food categories, including fast food, salty snack food, vegetable, fruit, and soft/sugared drinks. Items were rated from "dislike very much" (1), "dislike somewhat" (2), "neutral" (3), "like somewhat" (4), to "like very much" (5). The ratings on fast food, salty snack food, and soft/sugared drinks were reversely coded. The total score thus ranged from 5 to 25, and a higher score indicated more positive or healthier food preferences. The food preferences scale demonstrated good psychometrical properties with acceptable reliabilities. The Cronbach Alpha ( $\alpha$ ) for the scale is .654.

### HOUSEHOLD STRUCTURE

Household structure was categorized as nuclear family and extended family. Nuclear family was defined as the two-generation household consisting of parents and children, including households with one couple and children, single parent and children, or separated parent and children (Zeng & Wang, 2003). We did not distinguish biological and step-parents in the study. Extended family in this study referred to multigeneration (more than two) family households in which children lived with their parents and grandparents (Zeng & Wang, 2003). The extended family also included households in which children were living with their grandparents without one or both parents present. Due to increased labor-related migration in China over the past decades, the number of grandparents–grandchildren households (or skip-generation households) has been rapidly growing, especially in rural areas.

### SOCIOECONOMIC STATUS (SES)

Socioeconomic status is recognized as a critical factor influencing food preferences (Turrell, 1998). Household SES in this study included two variables: household income and household registration type (urban and rural).

Household income was a continuous variable and a summation of all income sources from all household members. As household income was quite skewed, this study used its natural log in regression models. Under China's dual household registration system, urban residents are assumed to enjoy better social welfare benefits and have higher SES as compared with people living in rural areas (Lu & Feng, 2008).

#### INDIVIDUAL CHARACTERISTICS

Adolescents' individual characteristics include participants' gender, age, years of education completed, and dietary knowledge. Dietary knowledge was measured by a question asking adolescents if they knew about the Chinese Food Pagoda or the dietary guidelines for Chinese residents. The first Food-based Dietary Guidelines (FBDGs) in China was issued by the Chinese Nutrition Society in 1987 and then revised in 1997. The Food Guide Pagoda was formulated to provide a general guideline about the food groups and the amount of each group to be consumed every day (Ge et al., 2007). Answers were recorded as 1 (yes) and 0 (no) with the latter as a reference category.

#### Analytic Strategy

*T*-test was used to determine if there was any significant difference of adolescents' food preferences between different categories, including gender, age, household income, and household structure. Ordinary least squares (OLS) regression was used to model the association between food preferences and household structure. In order to distinguish the relative contributions of individual and household variables, variables were entered in two steps. The study first examined the effect of adolescents' individual characteristics on their food preferences. Then, the household-related variables were added into the model to explore the effect of household structure after controlling for other independent factors. There is no alarming collinearity problem found among independent variables in the analytic models.

## RESULTS

#### Sample Description

Table 1 reports sample characteristics overall and by two types of family structure. Of a total of 662 adolescents aged 12 to 17 in 2006, 53.2% were boys and 46.8% were girls, and the average age was about 15. The present sample included 69.5% or 460 adolescents living in nuclear family households, and 30.5% or 202 living in extended families. Adolescents in the

**TABLE 1** Descriptive Characteristics of the Sample ( $n = 662$ )

	Overall ( $N = 662$ )			Nuclear family ( $n = 460$ )			Extended family ( $n = 202$ )		
	Mean	<i>SD</i>	%	Mean	<i>SD</i>	%	Mean	<i>SD</i>	%
Age	14.5	1.7		14.6	1.7		14.2	1.7	
Gender									
Male			53.2			54.3			50.5
Female			46.8			45.7			49.5
School status									
Currently in school			86.2			85.0			89.1
Currently not in school			13.8			15.0			10.9
Household per capital Income (thousand yuan)	5.5	5.7		6.0	6.3		4.3	4.1	
Household registration type									
Urban			37.8			36.7			40.1
Rural			62.2			63.3			59.9

former category on average are slightly older (14.6) than those in the latter category (14.2).

Overall, the mean of years of education completed is 8.4, and adolescents in nuclear families on average had more years of education (8.5) than their counterparts in extended families (8.1).

The mean household income per capital of the sample was about 5,482 Yuan (approximately \$830). Adolescents residing in nuclear families reported a higher level of household income than those living in extended families.

### Descriptive Statistics

*T*-test was used to investigate the potential differences of food preferences between dichotomous categories. Table 2 shows *t*-test results in five categories: age, gender, household income, household registration types, and household structure. As shown in the table, adolescents who were older than 14 scored significantly higher in food preferences than those who were under 14, which means older adolescents tended to have preferences towards healthier foods than the younger. There are no significant gender differences in food preferences.

The household SES, including household income and household registration type, seemed to be a negative factor to adolescents' food preferences. As shown in Table 2, adolescents who resided in households with higher income status on average demonstrated lower scores on the food preference scale than their counterparts. Similarly, those who lived in urban areas tended to have unhealthier food preferences as compared with those from rural areas ( $p < .01$ ). These findings are consistent with recent studies on

**TABLE 2** *T*-test Results on Adolescents' Food Preferences ( $N = 662$ )

Independent factors	Food preferences		
	Mean	<i>SD</i>	<i>p</i> -value
Age (median)			
$\geq 14$	15.79	2.91	.003**
$< 14$	15.00	2.87	
Gender			
Male	15.21	3.05	.100
Female	15.65	2.73	
Household per capital Income (median)			
$\geq \text{¥} 4040$	15.69	2.83	.070*
$< \text{¥} 4040$	15.20	2.96	
Household registration type			
Urban	15.03	2.96	.009**
Rural	15.73	2.83	
Household structure			
Nuclear family	15.64	2.89	.008**
Extended family	14.86	2.89	

Notes. \* $p < .10$ ; \*\* $p < .01$ . Two-tailed.

**TABLE 3** Adolescents' Food Preferences for Five Food Categories ( $N = 662$ )

Food preferences	Nuclear family	Extended family	<i>p</i> -value
	Mean ( <i>SD</i> )	Mean ( <i>SD</i> )	
Fast food	2.63 (1.27)	2.47 (1.20)	0.21
Salty snack food	2.47 (1.10)	2.30 (1.06)	0.09*
Fruit	4.25 (0.79)	4.19 (0.72)	0.33
Vegetables	3.90 (0.35)	3.84 (0.83)	0.45
Soft/Sugared drinks	2.35 (1.04)	2.19 (0.91)	0.07*

Notes. \* $p < .10$ . Two-tailed.

the dietary shift of children in China (Adair & Popkin, 2005). With improved household economic status, people in China are now consuming more animal fat and sugared food but fewer cereals and tubers (Zhai et al., 2007).

Table 2 also reports *t*-test results of food preferences between two types of household structure: nuclear family and extended family. The statistics indicate significant differences existed on food preferences between adolescents living in these two household types ( $p < .01$ ). That is, those residing in extended family households scored lower on food preferences than their counterparts living in nuclear families. Table 3 further presents the differences of adolescents' food preferences for five food categories: fast food, salted snack food, fruits, vegetables, and soft/sugared drinks. Scores indicate that adolescents from extended family households, compared with those from nuclear families, had more preferences towards fast food, salty snack food, and soft/sugared drinks but against vegetables and fruit.

## Regression Results

Table 4 reports results of OLS regression on adolescents' food preferences. As shown in the first model, age was significantly associated with reporting preferences towards healthy foods, but gender, education, and knowledge about the dietary guidelines were not. As expected, after controlling for age, gender, education, dietary knowledge, and other household variables, the second model reveals that adolescents' food preferences were still significantly associated with their household structure ( $p < .01$ ). In other words, holding other factors constant, adolescents who resided in extended families were less likely to have preferences toward healthy foods than their counterparts living in nuclear families. It is worth noting that adolescents' dietary knowledge was not statistically associated with food preferences, suggesting that adolescents' better dietary knowledge may not be automatically transferred to preferences toward healthy foods as assumed.

Other household variables also had effects on adolescents' food preferences. Consistent with the *t*-test results, adolescents' higher household SES, including urban residence and higher household income status, were found significantly associated with preferences toward unhealthy foods. After adding household variables to the model, the variance explained by the model increased from 0.155 to 0.243, suggesting the important contribution of household-related characteristics to the model. Another reduced model including only household variables was run separately (not shown in the article). Results show that net effect of household variables ( $R = 0.09$ ) is larger than that of individual variables ( $R = 0.06$ ). Previous studies have also shown that children's food preferences are strongly influenced by family circumstance as compared with individual factors. The regression models in the study, consistent with the literature, find that household characteristics were more relevant to the formation of adolescents' food preferences than individual characteristics such as gender, education, or dietary knowledge.

**TABLE 4** OLS Regression Results on Adolescents' Food Preferences ( $N = 662$ )

Independent factors	Food preferences	
	Model 1	Model 2
Age 15–17 (ref = aged 12–14)	0.86*	0.77*
Male (ref = female)	–0.35	–0.39
Years of education completed	–0.01	0.03
Having knowledge about dietary guidelines (ref = no knowledge)	–0.22	0.01
Extended family (ref = nuclear family)	—	–0.82**
Urban (ref = rural)	—	–0.57*
Household income (Log)	—	–0.30*
Intercept	15.28**	18.03**
$R^2(R)$	.002 (0.155)	0.06 (0.243)

Notes. \* $p < .05$ ; \*\* $p < .01$ .

## CONCLUSIONS AND IMPLICATIONS

This study examines the relationship between household living arrangements, measured by household structure, and adolescents' food preferences. Relevant adolescents' individual characteristics and household factors are also investigated. The findings are highly suggestive and have implications on adolescents' food and nutrition health intervention in China.

This study finds that adolescents living in extended families had lower preferences toward healthy foods than those living in nuclear families. They showed more liking for fast food, salted snack food, and sugared drinks, and less liking for vegetables and fruits. The findings are consistent with the study by Jiang et al. (2007) on intergenerational transmission of food choices, which shows that children taken care of by grandparents in extended family households were likely to form unhealthy food preferences. The study also finds that adolescents' food preferences were more associated with their household characteristics than some individual factors such as gender, education, and dietary knowledge.

The study shows that adolescents' knowledge of food guidelines may not automatically transfer to healthier food choices. As a child grows up, he or she may also acquire food-related information from school, friends, television, or the Internet. Nonetheless, as adolescents' dietary intake often takes place within the family context, their food knowledge may be strongly influenced by what their caregivers know about food and how the caregivers feed the children. Usually in extended families, grandparents prepare food for the whole household. As grandparents may have their own experience of poverty and hunger, they may believe that better caring for children means feeding them well, and tend to provide children with excessive food and/or use certain food such as sugared drinks or fast food as a reward (Jiang et al., 2007). As research has shown, the reward strategy used in taking care of young children tends to increase their preferences for the reward foods (Birch, Savage, & Ventura, 2007), which then may be significantly linked to their food preferences in later stages of life (Nicklaus, Boggio, Chabanet, & Issanchou, 2004).

These findings have implications for social work practice in designing and implementing child nutrition service programs in China's sociocultural context. First of all, nutritional education intervention that involves all family members especially grandparents is fairly important. Over the past decades, the Chinese government has paid increasing attention to its population's, especially children's, nutritional knowledge. The Food Guide Pagoda provides a critical guideline for children's dietary intake. However, as this study has implied, the knowledge-oriented education if only targeting children may not automatically lead to their better food choices. Under the Confucian cultural expectation in China, grandparents are expected to play an important role in helping their adult children with taking care of grandchildren.

While various family structures have emerged alongside the social transition, the extended family household is still a popular form in contemporary China. Social workers in the health and nutrition field should be sensitive to family factors that impact adolescents' eating practices. Research has found that intervention strategies targeting caregiver attitudes and behaviors may be more cost-effective for the promotion of children's healthy eating habits (Birch et al., 2007). In Chinese sociocultural context, grandparents' role in forming children's eating habits and dietary patterns deserve more emphasis, and nutrition programs targeting grandparents may be more effective as caregivers themselves need guidance in food-related knowledge and behaviors. For example, the new version of the FBDGs could be issued in different types to meet the needs of various population groups, especially grandparents as caregivers. With respect to the implementation of the FBDGs, it would be also useful to strengthen the training of nutrition workers at the community levels. Local social networks, such as some elderly support groups and kinship ties, are all-important resources for workers to utilize in promoting the popularization of the FBDGs.

Furthermore, a multidimensional approach to child nutritional service has its merits in China's context (Rosenthal, 1998; Shor, 2010). Biological and psycho-social factors of food preferences are often interrelated. A child may genetically respond to some favorable tastes, such as the preferences for sweet and salty tastes and the avoidance of sour and bitter tastes. But how a child's predispositions help foster healthy diets relies greatly on the eating environment, especially the context of food availability and child-feeding practices of the adults in the family (Birch, 1999). In recent years, school-based nutritional education and intervention among children have received burgeon attention in China (Jiang et al., 2006; Xia et al., 2004). However, school-based intervention alone is not enough. Adolescents' healthy eating behaviors need to be reinforced within the contexts of family, school, and community environments. While more focuses should be placed on the effect of a particular family context on children's food preferences, a multidimensional intervention model with joint efforts of school teachers, dieticians, health social workers, and so on needs to be developed.

This study has its limitations though. First, this is still an exploratory study. Due to limitations of the survey design, we were not able to include more individual and household factors such as children's self-identity, parental or grandparental food expectations, or other food-related behaviors into our analytic models. For instance, it might be interesting to compare respective influences of grandparents' and parents' eating behaviors on children's food preferences in order to explore more about the intergenerational transmission of eating habits. It would be also helpful to analyze more the relationship between adolescents' food preferences and the consumption of particular food categories, taking into account other factors beyond family, such as school, community, or work environment. Second, the data

selected for this particular study are cross-sectional, and thus are unable to track the change of adolescents' food preferences over time. In future research, longitudinal data will be utilized for advanced understanding of the causal relationship between family circumstances and adolescents' food preferences and eating behaviors.

## REFERENCES

- Adair, L.S., & Popkin, B.M. (2005). Are child eating patterns being transformed globally? *Obesity Research*, *13*(7), 1281–1299.
- Baxier, S., & Thompson, W. (2002). Fourth-grade children's consumption of fruit and vegetable items available as part of school lunches is closely related to preferences. *Journal of Nutrition Education and Behaviour*, *34*(3), 166–171.
- Birch, L.L. (1979). Preschool children's food preferences and consumption patterns. *Journal of Nutrition Education*, *11*, 189–192.
- Birch, L.L. (1999). Development of food preferences. *Annual Review of Nutrition*, *19*, 41–62.
- Birch, L.L., & Fisher, J.O. (1997). Development of eating behaviors among children and adolescents. *Pediatrics*, *101*(3 Pt 2), 539–549.
- Birch, L.L., Savage, J.S., & Ventura, A. (2007). Influences on the development of children's eating behaviors: From infancy to adolescence. *Canadian Journal of Dietetic Practice and Research*, *68*(1), s1–s56.
- Cavanagh, S.E. (2008). Family structure history and adolescent adjustment. *Journal of Family Issues*, *29*(7), 944–980.
- Chen, X., & Silverstein, M. (2000). Intergenerational social support and the psychological well-being of older parents in China. *Research on Aging*, *22*, 43–65.
- Cooke, L.J., & Wardle, J. (2005). Age and gender differences in children's food preferences. *British Journal of Nutrition*, *93*, 741–746.
- Drewnowski, A. (1997). Taste preferences and food intake. *Annual Review of Nutrition*, *17*, 237–253.
- Ge, K., Jia, J., & Liu, H. (2007). Food-based dietary guidelines in China: Practices and problems. *Annals of Nutrition and Metabolism*, *51*(Suppl. 2), 26–31.
- Guidetti, M., & Cavazza, N. (2008). Structure of the relationship between parents' and children's food preferences and avoidances: An explorative study. *Appetite*, *50*, 83–90.
- Hasenboehler, K., Munsch, S., Meyer, A., Kappler, C., & Vogege, C. (2009). Family structure, body mass index, and eating behavior. *International Journal of Eating Disorders*, *42*(4), 332–338.
- Jiang, J., Rosenqvist, U., Wang, H., Greiner, T., Lian, G., & Sarkadi, A. (2007). Influence of grandparents on eating behaviors of young children in Chinese three-generation families. *Appetite*, *48*, 377–383.
- Jiang, J., Xia, X., Greiner, T., Wu, G., Lian, G., & Rosenqvist, U. (2006). The effects of a 3-year obesity intervention in schoolchildren in Beijing. *Child: Health, Care and Development*, *33*(5), 641–646.

- Johnson-Down, L., O'Loughlin, J., Koski, K., & Gray-Donald, K. (1997). High prevalence of obesity in low income and multiethnic schoolchildren: A diet and physical activity assessment. *The Journal of Nutrition* 127(12), 2310–2315.
- Lu, M., & Feng, M. (2008). Reforming the welfare system in the People's Republic of China. *Asian Development Review*, 25(1&2), 58–80.
- Lytle, L., Seifert, S., Greenstein, J., & McGovern, P. (2000). How do children's eating patterns and food choices change over time? Results from a cohort study. *American Journal of Health Promotion*, 14, 222–228.
- Nicklaus, S., Boggio, V., Chabanet, C., & Issanchou, S. (2004). A prospective study of food preference in childhood. *Food Quality and Preference*, 15, 805–818.
- Patrick, H., & Nicklas, T.A. (2005). A review of family and social determinants of children's eating patterns and diet quality. *Journal of American College of Nutrition*, 24(2), 83–92.
- Pearson, N., MacFarlane, A., Crawford, D., & Biddle, S.J.H. (2009). Family circumstance and adolescent dietary behaviors. *Appetite*, 52, 668–674.
- Popkin, B.M. (2001). Nutrition in transition: The changing global nutrition challenge. *Asia Pacific Journal of Clinical Nutrition*, 10(Suppl.), S13–S18.
- Rosenthal, B.B. (1998). Collaboration for the nutrition field: Synthesis of selected literature. *Journal of Nutrition Education*, 30(5), 246–267.
- Rozin, P. (1991). Family resemblance in food and other domains: The family paradox and the role of parental congruence. *Appetite*, 16, 93–102.
- Savage, J.S., Fisher, J.O., & Birch, L.L. (2007, Spring). Parental influence on eating behavior: Conception to adolescence. *Journal of Law, Medicine and Ethics*, 22–34.
- Shor, R. (2010). Interdisciplinary collaboration between social workers and dieticians in nutrition education programs for children-at-risk. *Social Work in Health Care*, 49(4), 345–361.
- Silverstein, M., Cong, Z., & Li, S. (2006). Intergenerational transfers and living arrangements of older people in rural China: Consequences for psychological well-being. *The Journals of Gerontology*, 61B(5), S256–S266.
- Stewart, S.D., & Menning, C.L. (2009). Family structure, nonresident father involvement, and adolescent eating patterns. *Journal of Adolescent Health*, 45, 193–201.
- Strauss, R., & Knight, J. (1999). Influence of the home environment on the development of obesity in children. *Pediatrics*, 103, 85–93.
- Turrell, G. (1998). Socioeconomic differences in food preferences and their influence on healthy food purchasing choices. *Journal of Human Nutrition Diet*, 11(2), 135–149.
- Wardle, J., Sanderson, S., Guthrie, C.A., Rapoport, L., & Plomin, R. (2002). Parental feeding style and the inter-generational transmission of obesity risk. *Obesity Research*, 10, 453–462.
- Xia, S., Zhang, X., Xu, S., Tang, S., Yu, S., Aldinger, C., & Glasauer, P. (2004). Creating health-promoting schools in China with a focus on nutrition. *Health Promotion International*, 19(4), 409–418.
- Zeng, Y. (2001). A demographic analysis of family households in China, 1982–1995. *Journal of Comparative Family Studies*, 33(2), 15–34.

- Zeng, Y., & Wang, Z. (2003). Dynamics of family and elderly living arrangements in China: New lessons learned from the 2000 Census. *The China Review*, 3(2), 95–119.
- Zhai, F., Wang, H., Du, S., He, Y., Wang, Z., Ge, K., & Popkin, B.M. (2007). Lifespan nutrition and changing socio-economic conditions in China. *Asia Pacific Journal of Clinical Nutrition*, 16(Suppl. 1), 374–382.
- Zhao, Z. (2000). Coresidential patterns in historical China: A simulation study. *Population and Development Review*, 26(2), 263–293.