

# Caregiver styles of feeding and child acceptance of food in rural Viet Nam\*

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## Abstract

*Style of child feeding may be an important determinant of child nutrition and health outcomes. Responsive feeding refers to the level and kind of interaction between caregiver and child that lead to a positive feeding experience, adequate dietary intake, and enhanced developmental opportunities. Responsive feeding behaviors may include active physical help and verbalization during feeding, role-playing, persistence, and positive feeding strategies. The aim of this study was to investigate styles of feeding among Vietnamese children 12 or 18 months of age from a rural province in northern Viet Nam. Forty child/mother pairs were videotaped during two, two-hour feeding episodes. Caregiver and child behaviors were coded at the level of the "intended bite" as observed through the videotape analysis of feeding episodes to assess caregiver behavior and the child's interest and acceptance of food. We found it feasible to use videotape and the modified coding and analysis scheme, originally developed for work in Peru, in Viet Nam. In Viet Nam, caregivers provided physical help to eat nearly all of the time in the younger children, and about 70% of the time among 18 month olds. Caregivers verbalized during only 30% of intended bites, and only half of these verbalizations were responsive in tone or words. Positive caregiver behaviors were significantly associated with higher child's acceptance of food,*

*while non-responsive feeding behaviors were associated with child rejection of food. Future analyses of this data set will evaluate the degree to which an integrated nutrition program positively modified caretaker behaviors. More research is needed to demonstrate the relationships among the promotion of responsive feeding behaviors, acceptance of food, and improved nutrition and health status of children.*

**Key words:** nutrition and care, infant feeding, diet, parental feeding styles, Viet Nam

## Introduction

Child malnutrition, a major public health problem in developing countries, is usually attributed to growth faltering, which is primarily a consequence of repeated infectious episodes and inadequate nutrient intakes. Infants are often fed diets that are low in nutrient quantity and quality, and interventions have generally focused on improving complementary feeding diets that are appropriate to the setting [1].

Recently, however, there has been considerable interest in the role of styles of child feeding as an important determinant of dietary intake, child nutrition and health outcomes [2–5]. The UNICEF conceptual framework [4] suggests that care and feeding, in addition to food security, health care services, and a healthy environment, are critical for children's survival,

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\* The ViSION (Viet Nam study to improve outcomes in nutrition) project evaluated the implementation and impact of an integrated nutrition program on the nutritional status, morbidity, diet of, and care for children 5 to 25 months old at baseline in rural Viet Nam, through a partnership among Save the Children/US (Hanoi and Westport, Conn., USA), the USAID-funded LINKAGES Project (Washington, D.C.), Emory University's Rollins School of Public Health (Atlanta, Ga., USA), and the Research and Training Center for Community Development (Hanoi).

growth, and development. This is particularly relevant in resource-poor settings, where enhanced care giving behaviors can optimize existing food sources.

Feeding behaviors cluster in patterns that represent an overall feeding style and these behaviors are often embedded in “cultural ethnotheories” of parenting and care [6]. For example, in Peru, where caregivers offer little physical help to eat and rarely verbally encourage their child to eat during a feeding episode, there is a strong belief system that children ‘know’ how much they should eat and/or that in order to be independent and autonomous, it is important that they self-feed at an early age [7].

Three caregiver styles have been conceptualized by Birch and Fisher [8]: controlling, laissez-faire, and responsive. In a highly controlled style of feeding, the caregiver has the intention to control when and how much the child eats, either through dietary restriction or overfeeding. This style of feeding has been observed in the United States and has been associated with pediatric obesity risk [9, 10]. At the opposite end of the continuum, caregivers may provide little physical help or encouragement to eat, and this feeding style may be based on cultural beliefs that children know when and how much they should eat or that children should develop independent feeding styles at an early age [7]. This “laissez-faire” or passive style describes low levels of caregiver-child interaction during feeding episodes. The caregiver may not understand or respond to her child’s cues of hunger or satiety clearly, and this may be particularly maladaptive when children have low appetites and reject food [11, 12]. Responsive (or active) feeding refers to the level and kind of interaction between caregiver and child that leads to a positive feeding experience, adequate dietary intake, and enhanced developmental opportunities. Responsive feeding behaviors may include active physical help and verbalization during feeding, role-playing, persistence, and positive feeding strategies. Indeed, the UNICEF care and nutrition conceptual framework encourages active feeding as a programmatic emphasis to improve child nutrition [4].

To investigate feeding styles of rural Vietnamese caregivers for their young children, we conducted an observation study using a coding scheme developed and tested in Peru [7, 13]. This study was conducted within the context of a large randomized intervention trial, the ViSION (Viet Nam study to improve outcomes in nutrition) project [14]. The specific aim of this paper is to report on the feasibility of the videotaping, coding and analysis scheme within the Vietnamese context and to examine the association between feeding style and child acceptance of food. Future analyses with a larger sample will examine the effects of the intervention on feeding style and dietary intake.

## Study sample

The study was conducted among children 12 or 18 months of age in northern Viet Nam. We coded the findings using 80 videotapes of snack and lunchtime feeding episodes of 40 children (20 males and 20 females) and their caregivers. These observations represent a subset of the children in larger study as well as the total number of tapes obtained as described here.

Of the 240 children who participated in the larger ViSION project, we only attempted to videotape about half of these due to resource and timing constraints. Of 119 children selected for video observation, six were observed only once and 10 children were not observed due to refusal to participate or scheduling difficulties. Thus, 103 children and their mothers were successfully videotaped twice for two hours each for a total of 206, two-hour tapes. For the analysis, we selected a subset of 80 tapes (40 children). During the coding process, 12 tapes (six children) were excluded because of the inability to consistently observe both the caregiver and child during the feeding episodes; these were replaced by a tape randomly selected from those remaining.

The final sample for this analysis thus includes 40 children, 37 of whom have one lunch feeding episode and three of whom have two feeding episodes available on the two tapes, for a total of 43 feeding episodes. All 40 children were observed during the main afternoon mealtime; 29 of those had both the main mealtime and snack; whereas, 11 children were observed only during the main meal and not during a snack.

## Methodology

Children were videotaped in their homes during snack and meal feeding episodes. We video-recorded two, two hour-segments of care timed around a child feeding. Subjects were videotaped on two different days seven days apart. We used a DCR-TRV103 Sony Digital Handycam Camcorder (Sony Corporation, Tokyo) with two one-hour tapes per encounter. The two-person field team consisted of a photographer and a minute-by-minute activity recorder to facilitate reviewing the video. Field workers encouraged routine activity, including instructions to the mother to avoid changes in the usual feeding. If the caregiver-child pair became physically separated beyond the camera frame, we videotaped the child. The camera operator attempted to film the faces of both caregivers and child at all times.

The observational videotape data were subsequently coded using the strategy developed previously [7, 13]. Caregiver and child behaviors were coded at the level of the “intended bite” as observed through the videotape analysis of feeding episodes. An intended bite is

operationalized as the unit of analysis when food was brought up to the child's mouth (either by the caregiver or the child) with the intention of it entering the mouth for consumption, whether it was consumed/swallowed or not. For example, intended bites may include a caregiver who offers food to a child who subsequently rejects it, a child who lifts food toward her mouth but puts it down before it enters her mouth, or the child who rejects food by spitting it out. This frame-by-frame coding scheme was previously tested for reliability in Peru [7] and is particularly feasible when coding videotape data, since the coder can stop, rewind, and restart the tape as necessary. Data codes included the duration of the feeding episode, the type of preparation and consistency of each food offered, the number of intended bites, the feeder identification, the utensils used, the distance between the child and the caregiver, the position of the caregiver in relation to the child, physical and verbal help offered to the child, and the interest of the child in the food or bite.

The coding scheme for the caregiver and child observations during feeding were as follows. *Physical help* was defined as: 0, no help offered; 1, facilitated feeding or directly helped; 2, used physical pressure; or 3, forced the child to consume the bite through physical action. *Child interest* in the food was coded as: 1, child eagerly accepted food by leaning forward, opening mouth, reaching for hand or spoon of feeder; 2, passively accepted the food (not eagerly); 3, accepted the food, then subsequently rejected it; 4, rejected the food, then accepted it; or 5, completely rejected the food. *Verbalization* of the caregiver was defined as: 0, no verbalization; 1, positive verbalization; 2, "mechanical" verbalization ("open your mouth" or "eat"); or 3, verbal order or threat ("eat or...!").

We coded the caregiver behavior and child acceptance (or rejection) of food. In this analysis, we coded caretaker and child. The unit of analysis was the level of the 'intended' bite, but not the order. The results should thus be interpreted as correlations between caretaker behavior and child acceptance or rejection of food.

Coding the video observations to try to determine the causal sequence of which came first, e.g., positive caretaker verbalization or child acceptance, requires more complex coding methodology and will be undertaken at a future date.

All videotapes were coded by one observer (PBH), under the training and supervision of one of the authors. The data were analyzed using Stata [15], which permitted tests of proportions. A level of  $p = .05$  was considered significant. The unit of analysis is at the level of the intended bite, as described above, and includes both snack and lunchtime feeding episodes.

## Results

The methodology developed in Peru to evaluate feeding styles was easily adapted for application in Viet Nam. In both settings, the use of a video camera in a home environment was acceptable and response bias (while not formally tested in Viet Nam) did not seem problematic. In comparing the two cultures, Vietnamese caregivers were more likely to sit with their children and verbalize during feeding episodes than rural Andean mothers in Peru, and were similar in their level of verbalization to urban Peruvian mothers [7].

Among 12 month-old children, the main feeders were the mother (52%), the grandmother (23%), a sister (16%), the child herself (3%), the father (4%), and others (2%). For children in the 18-month age group, the main feeders were the mother (38%), the child herself (35%), the grandmother (14%), the father (10%), and others (3%).

Feeding duration in the Viet Nam study varied widely (range 1 to 49 minutes) but was uninfluenced by breastfeeding during the episode (median duration = 19 vs. 20 minutes, for 12 month and 18 month old children, respectively (table 1). There were no significant differences in duration of feeding in the younger or older children.

Children 12 months of age were more likely to

TABLE 1. Inter-quartile, mean, standard deviation, and range of duration of feeding episodes by age groups

Duration of feeding episode	Age group (mo)	Total feeding episodes	Mean (minutes)	SD	Range		Inter-quartile		
					Minimum	Maximum	25%	50%	75%
Duration of meal-feeding episode with breastfeeding	12	32	16.9	12.8	2	49	6	16.5	24.5
	18	30	17.3	13.1	1	48	4	17	26
Duration of meal-feeding episode without breastfeeding	12	21	22.0	12.0	3	49	15	19	30
	18	22	22.6	11.4	4	48	15	20	31
Duration of breastfeeding during the meal feeding episode	12	11	6.9	5.9	2	19	3	5	10
	18	8	2.7	1.5	1	5	1.5	2.5	4

be fed semi-solid puddings, porridges, or noodles, while older children were more likely to be served rice (table 2). Overall dietary variety and micronutrient quality appeared limited among this sample, even among older children, with rice as the main ingredient in the majority of food items (rice, porridge, pudding). However, these data do not reflect complete recipes or

ingredients of the offered dishes, and we do not have quantities of foods for conducting nutrient analyses specific to these feeding observations. Information on dietary intakes of these same children based on detailed 24-hour recalls for other days are presented elsewhere [16].

We assessed caregiver physical help to eat by whether children accepted or rejected bites of food (table 3). The data show that younger children almost always received physical help to eat, while 18 month old children fed themselves about 70% of the time. Younger children who were coded as accepting food had caregivers who were more likely to have offered help, but the opposite occurred with the older children. This may be due to children rejecting help because they want to feed themselves. The use of physical pressure or force feeding (negative, non responsive feeding behaviors) were significantly associated with child rejection of food, except among 12 month old children for pressure.

Caregivers usually provided no verbalization to the child during feeding (70% and 69% of intended bites) for 12 month and 18 month old children, respectively. When verbalization did occur (30% of intended bites), it varied according to whether or not the child accepted or rejected the food (table 4). Rejecting intended bites was more often associated with negative or threatening verbalizations than among non-rejecting bites. For caregivers of both 12 month and 18 month old children, positive verbalization occurred more often among children who were coded as accepting food, and this association was much stronger among the 18-month-old children.

TABLE 2. Food served during child feeding episodes

Food served child during feeding episode	Age group	
	12 mo n = 640 (% of bites)	18 mo n = 710 (% of bites)
Porridge (whole rice cooked with water)	37.2	34.0
Rice noodles	21.2	8.9
Pudding (ground rice, cooked with water, may include added salt or sugar)	19.5	7.9
Rice (plain)	10.8	35.9
Milk or milk products	3.0	0.0
Water	2.2	1.8
Fruit	2.0	7.3
Vegetables	2.0	1.6
Breastmilk	1.7	1.1
Potato/bread/cassava (other starchy food)	0.2	1.0
Biscuit/cookie/candy	0.2	0.1
Meat/fish	0.0	0.1

Table 3. Caregiver’s physical action to help the child eat or drink by interest of the child to eat and age

Caregiver’s physical action to help the child eat or drink	Age group					
	12 mo			18 mo		
	Child accepted food (% of bites) n = 431	Child rejected food (% of bites) n = 198	Test of proportions p value	Child accepted food (% of bites) n = 568	Child rejected food (% of bites) n = 148	Test of proportions p value
No physical help offered	2.3	0	0.03	29.0	0	< .001
Facilitated the feeding process or directly helped the child (positive behavior)	84.5	73.7	0.001	63.2	72.9	.02
Used physical pressure, including pressing down the spoon in the child’s mouth or restraining the child lightly to facilitate eating (negative behavior)	9.9	11.1	0.70	4.2	13.5	< .001
Force fed the child (negative behavior)	3.2	15.2	< 0.001	3.5	13.5	< .001
Total	100	100		100	100	

TABLE 4. Type of verbalization by caregivers, interest of child to food, and age (among 30% of bites when any verbalization was observed)

Type of verbalization given by caregiver	Age group					
	12 mo			18 mo		
	Child accepted food (% of bites) <i>n</i> = 121	Child rejected food (% of bites) <i>n</i> = 65	Test of proportions <i>p</i> value	Child accepted food (% of bites) <i>n</i> = 157	Child rejected food (% of bites) <i>n</i> = 56	Test of proportions <i>p</i> value
Positive verbalization	55.4	40.0	.05	47.8	19.6	< .001
Mechanical, direct comments to eat (negative verbal)	43.8	58.5	.06	51.6	71.4	.01
Order or threaten (negative verbal)	0.8	1.5	.65	0.6	8.9	.001
Total	100	100		100	100	

## Discussion

We have presented an observational methodology that examines the dyadic nature of child feeding and child acceptance of food through videotape assessment in the home environment. The use of videotaping equipment within the home environment and the observational methodology was generally well accepted by caretakers and children. Less than 10% of the caretakers refused to participate. While we could not conduct a formal validation of this methodology, anecdotal reports by experienced field workers suggested that caretakers and children behaved similarly as they do when not being observed or videotaped. Future analyses will compare results from the second observation with that of the first, conducted approximately seven days earlier, to assess potential initial discomfort and alteration in behaviors.

The majority of caregivers in Viet Nam physically help their children to eat, particularly when children are 12 months old, when they are still learning how to manipulate food, taste, chew, and consume a wider diversity of foods. There was an association between child rejection of food and negative feeding behaviors (pressure and force). Positive verbalization was associated with higher rates of acceptance of food, particularly among older children. Mechanical or threatening verbalization was associated with higher rates of rejection. While more work is required among the larger sample, our data suggest that when caregivers do exhibit responsive feeding behaviors (e.g., non pressuring or forceful behaviors) and positive verbalization to the child, acceptance of food is higher. If caregiver behaviors are causal, this may increase their dietary and nutrient intake.

Verbalization during feeding episodes has been positively associated with dietary intake and child development [17], yet during more than 70% of the feeding episodes no verbalization was observed. When

caregiver verbalization did occur (among 30% of the observations), more than half were coded as negative—with the caregiver either talking mechanically or giving a direct order. The strong statistical association in our data between positive verbalization and child interest or acceptance of food (particularly among the older children) suggests that simple program messages that encourage caregivers to softly, patiently, and positively talk to their children about their food intake during feeding could have a positive impact on child dietary intake, particularly in settings where anorexia and growth faltering are a major child nutrition problem.

These preliminary findings from this observational study of feeding styles provide insight into the mechanisms for how the community empowerment and nutrition program (CENP) intervention evaluated through the ViSION project resulted in improved dietary intakes and growth among young children. The videotape results provide evidence that Vietnamese mothers are generally active or responsive in their feeding style rather than passive or *laissez-faire*. With information and tips on the use of novel foods garnered through the nutrition education rehabilitation program (NERP) sessions or their neighbors that attended them, there is evidence that caretakers would actively utilize these improved practices and foods when feeding their children. Future analyses will examine the impact of direct participation in the NERPs on feeding style and the relationship between feeding style and dietary intakes and growth in this population.

A key limitation of the current analysis is that we did not code the videotapes in such a way that we could analyze the sequence of caretaker versus child actions. The findings are thus correlations of behaviors at the bite level and should be interpreted cautiously due to potential problems with “reverse causality.” We cannot be sure of the direction of effects between child and mother in this initial analysis. It is clear that caregiver and child feeding is dyadic. Nevertheless, the strong

associations between the negative behaviors we coded (pressure, force, and negative verbalizations) and child rejection of food suggest caregivers are responding to their child's rejection of food and not the other way around. These are similar to patterns we have observed in several other settings [7, 12, 13, 18].

In the Andes of Peru [7], the highlands of Guatemala [19], urban Nicaragua [18], rural Nigeria [7], and rural Mali [11], among other settings, it is common for children to reject food that is offered, particularly in settings with a high burden of morbidity [12, 20]. What appears to vary across cultures is how caregivers respond to their children's acceptance or rejection of food. Nigerian mothers exhibit outright force-feeding styles to ensure their infants consume what is offered [7, 21]. In rural Peru and Guatemala, caregivers are extremely *laissez-faire* in their feeding style, but do provide more physical and verbal encouragement when their children reject food, as observed in Viet Nam. The Vietnamese mothers in this sample are more mechanical in their verbalization during feeding style, but may become forceful and even 'threatening' in their tone when children reject food. Again, we cannot be certain that our results are in most cases not due to

reverse causality (i.e., children who are more accepting of their food encourage responsive feeding behaviors by their caregivers), and this will be examined through our subsequent analysis.

International programs are already encouraging responsive or active feeding as part of complementary feeding counseling [4], with the assumption that positive caregiver feeding behaviors will result in improved dietary intakes and nutrition of children. We believe that there is a growing body of literature that supports this approach, but more research is needed to evaluate how promotion of specific responsive feeding messages can lead to caregiver behavior change and improvements in child dietary intake and nutrition in different sociocultural settings.

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