

The study sought to situate individual behavioral realities in relation to cultural and societal norms about infant feeding. Norms are “what people say they do” or what they say they ought to do, whilst realities refer to “what they actually do” (Randall, 1988). Differentiating norms and realities requires different sets of methodological tools, which, in turn, produce different kinds of data. Accessing information of this kind involves intensive work with individuals and communities and is best accomplished by qualitative techniques. The limited sample size is compensated by the depth and breadth of information collected, although it is recognized that the themes that emerge may not be generalizable to other areas of Mali.

The most appropriate approach involved working with mothers of children with contrasting nutritional outcomes to seek to identify differences in perception and behavior that may be linked to nutritional advantage or disadvantage. Contrast samples (Bernard, 1995) comprising extremes of this type provide useful information about cases that can provide sharp illustrations of motivations behind different care and feeding practices (Myntti, 1993).

Potential biases in this approach, however, need to be recognized. In selecting extreme cases on this basis for intensive fieldwork, interviewers were aware of the child’s nutritional status before interviewing or observing the mother. It is possible that the interviewers’ preconceptions about what they expected to find influenced their own interactions with the mother. For example, those who knew beforehand that they were interviewing mothers of well-nourished children may note and probe for healthy, positive behaviors and ignore detrimental practices. By contrast, those who knew a priori that the child in question was malnourished may focus mainly on inappropriate behaviors and fail to search for positive aspects of child rearing.

5.1 INTERVIEWER TRAINING

The interviewers were chosen because of the principal investigators' previous collaboration with them or because of personal recommendations about their competence and skills. The team was composed of two men and two women. One of the women was a pediatrician and could thus provide advice to mothers of malnourished children after the survey, which ethically made the study more acceptable. All but one member of the team spoke Fulfulde. Throughout the study, there was a very good team spirit and rapport, which facilitated data collection.

The training occurred over a two-week period in Bamako in October 1999, during which the team members were encouraged to participate actively in the development of the research instruments. Careful attention was paid to training in the measurement of children's weight and height because any errors in the calculation of the anthropometric indices could have jeopardized the entire study since the children were classified according to their nutritional status.

5.2 RESEARCH INSTRUMENTS AND AVAILABLE DATA

Several methods generating different types of data were used to confirm or reject each of the hypotheses presented above. The number of the hypothesis addressed by each method is noted in parentheses.

Discussion groups (1, 2)

In one rural and one urban setting, a series of discussion groups (somewhat similar to focus groups) were carried out with those who may have influence on children's nutritional status and on mothers' decisionmaking about infant feeding. These groups included adolescent girls who act as caretakers for their infant brothers and sisters and also included older men and grandmothers who may wield substantial social and economic power in their household and thus influence mothers' resources for child health. The discussion groups with the adolescent girls centered on when and why they act as surrogate caretakers for their younger siblings and the kinds of feeding and nonfeeding interactions they engage in with them. The discussions with the older people focused on changes in attitudes and behaviors about infant feeding and their reasons for them. All six discussions were tape-recorded, translated from Bambara or Fulfulde, and written out. The translated texts were entered and analyzed using the Ethnograph computer software.

Household censuses and anthropometric data (2, 4)

In each setting, all eligible households were enumerated and information was taken about the age and sex of each household member. For eligible children, age was verified with a health card where possible. Those children who had been hospitalized in the past six months were excluded from the study because it is thought that their care and treatment was not representative of community-level practices. As children were weighed and measured their weight and height (length) was entered on the form. These data were then entered using ISSA5 software. Although the study presented here only uses data related to height and age, future analyzes will be able to focus on the other anthropometric indices.

In-depth interviews (1, 3)

The in-depth interviews were carried out using a guide with open-ended questions about each subject of interest. The topics covered included details about the woman's marital and familial status, including her satisfaction with her life as a spouse and mother, her views about the quantity and quality of her breast milk, acceptable and appreciated characteristics of food and eating arrangements, cues for feeding and supplementation, appropriate foods for supplementation, infant feeding during illness, and nonfeeding interactions with the child. Interviewers were encouraged to pursue subjects in detail and to follow up pertinent themes as they emerged from the discussion. Each interview lasted approximately one hour. All interviews were tape-recorded in Bambara or Fulfulde, then translated into French and written down. The translations were entered and analyzed using the Ethnograph computer software.

Structured observations (1, 2, 3)

As described, the four children exhibiting the best Z-scores (height-for-age) and the four exhibiting the worst Z-scores (height-for-age) at each site were chosen for structured observations of caretaker-child interactions and feeding and nonfeeding activities. On the form, each minute was used as a unit of observation for the periods of 8-10 AM, 12-2 PM, and 4-6 PM. These periods were selected to coincide with meal consumption or preparation because it was thought that these times would have implications for maternal workloads and infant feeding. However, one woman in Mopti declined to be followed and dropped out of the study, and one only allowed her child to be followed for 330 minutes, leaving blank 30 full observations.²

² This was allowed for in the analyzes, which used a file aggregated to the individual level in which each individual normally contributed 360 minutes of observation time. The number of minutes of the activity of interest observed for this case were thus divided by 330 and multiplied by 360.

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For each minute of observation, the child's location was noted, together with the mother's activity (if she was in view); the sex, age, and relationship of surrogate caretakers; the infant's primary activity; and consumption of breast milk and complementary liquids and solids. A section of the form was also available for specific comments about caretaking or feeding practices. The data were entered in SPSS with each minute representing the unit of analysis. Thus, 11,130 units of observation are available for analysis.

5.3 SELECTION BIASES

As Table 3 shows for the urban sites, four women declined to be interviewed, including three mothers of malnourished children. A mother of another malnourished child refused to be observed during her daily activities. Furthermore, an additional mother of an urban malnourished child angrily cut short the observation of her child half an hour before the scheduled end of the interview. We recognize that the methods used are intrusive despite the efforts of the fieldworkers to sensitively explain the study to the women involved. It is possible that mothers of malnourished children recognize that their infants are not thriving and feel a certain degree of shame or embarrassment. The close contact between these women and the fieldworkers may have increased this sense of unease and may have caused them to curtail their involvement in the study. There may therefore be a degree of bias in the results presented here in that a number of the mothers of the most malnourished children are underrepresented in the final results.

5.4 SAMPLE SELECTION

In accord with Malian custom, initial contact in each community was made with the chief and village elders in order to fully explain the aim of the study. Their complete cooperation and full participation greatly facilitated the smooth running of the data collection. Each woman with an eligible child was then contacted, and the nature of the interview and observations was explained to her along with the broader purpose of the research.

The study benefited from the acquisition of newly released figures from the 1998 census of Mali, which listed by *secteur d'énumération*³ the names of household heads and the individuals in each household. These lists were of considerable help in enumerating the population in each site and in identifying women of child-bearing age. Each list was brought up-to-date by consulting the chief and elders in each setting and adding or deleting the names of household heads as appropriate. In Synda and Boré, the entire population of each village was enumerated, and all children age 3-12 months were weighed and measured. As can be seen in Table 3, 36 children of the right age were identified in Synda and 40 were identified in Boré.

In Mopti, the *secteur d'énumération* falling in the urban quarter of Gangal was chosen because it was thought to represent a typical population of the town in terms of socioeconomic status. In Sevaré, the *secteur d'énumération* falling in the urban quarter of Bamako-Coura was chosen for the same reason. In each urban sample, all lists of household heads were updated, and one in two were chosen for enumeration of all individuals in order to identify eligible children.

³ Each *secteur d'énumération* corresponds to approximately 500 people.

	RURAL				URBAN			
	Synda		Boré		Mopti		Sevaré	
	Well nourished	Mal- nourished	Well nourished	Mal- nourished	Well nourished	Mal- nourished	Well nourished	Mal- nourished
Number of eligible children	36		40		34		45	
Number of mothers interviewed	10	9	10	10	9	9	10	9
Number of children observed	4	4	4	4	4	3	4	4

Table 3 shows the number of eligible children by study site and the number subsequently weighed, measured, and observed. At each site, all eligible children were weighed and measured, and anthropometric Z-scores for height-for-age were calculated using Epi-Info (version 6.0). The children were then ranked by their Z-scores from best to worst. The mothers of the ten children with the best Z scores were chosen for in-depth interviews along with the mothers of the ten children with the worst Z-scores at each study site. For each of the women selected for an interview, a screening instrument was used to note her age, parity, educational status, and occupation. Subsequently, among these subgroups at each site, the four children with the best height-for-age Z-scores were chosen for observation along with the four children with the worst height-for-age Z-scores.

Information on the nutritional status (height-for-age Z-score) of the sample of children weighed and measured in each setting⁴ indicates that in Synda, the nutritional status was extremely poor: only 6 out of the 32 children had a Z-score of between 0 and 1. Twelve children had Z-scores of minus 2 or below, indicating that they were severely malnourished. In Boré, the situation was not much better despite the comparatively improved economic situation of the village. Eleven of the children had Z-scores of below minus 2, while just 6 out of the 40 had Z-scores between 0 and 2. Little difference was evident between the towns of Mopti and Sevaré although more children were mildly rather than severely malnourished when compared with the rural areas.

5.5 CHARACTERISTICS OF SAMPLE CHILDREN

Table 4 shows the characteristics of the children enrolled in the study. It indicates that a slightly higher percentage of the malnourished children were boys. A significantly higher percentage of those who were malnourished were between 9 and 12 months of age. Importantly, the table also shows that nearly four times the percentage of well-nourished children were below six months of age with the malnourished. By contrast, nearly two-thirds of the malnourished children were age 10-12 months, compared with less than a third of those who were well nourished. Approximately one third of each group was age 6-9 months. The differences in the percentage malnourished by age was statistically significant ($\chi^2=11.39$, $df=2$, $p<0.01$).

⁴ It should be noted that most of the women were illiterate and often found it difficult to recall their child's age. This, combined with interviewer bias, may account for the apparent age-heaping on 12 months evident in the figures.

Characteristic	Percentage well-nourished children (N=39)	Percentage malnourished children (N=39)
Sex		
Boys	49	64
Girls	51	36
Age		
3-5 months	37	8
6-9 months	34	32
10-12 months	29	61
Total	100	100

5.6 CHARACTERISTICS OF WOMEN INTERVIEWED

Table 5 shows key characteristics of the mothers⁵ of well-nourished and malnourished children. The contrast between mothers less than 25 years old and those more than 35 years old is particularly striking. It also indicates that the majority of malnourished children were those of younger mothers (less than 25 years of age). Finding that the mothers of malnourished children were likely to be young may be due to the increased risk associated with very early age at first birth and with parity one and may also reflect fundamental differences in the household dynamics of the women concerned. It will be shown later that young women often consider themselves inexperienced and rely on the advice of older affines who often take control of their children. Differences in the proportions of well-nourished and malnourished children with a mother below 25 years of age were nearly statistically significant following a Fisher's Exact Test ($p=0.06$).

Most mothers were married although the small number who were divorced, widowed, or single recounted how their status added extra difficulty to their ability to care for their children. More than three times the proportion of well-nourished children had mothers with some schooling, compared with those who were malnourished. This difference is statistically significant (Fisher's Exact Test, $p<0.05$) and reflects trends observed in the Mali DHS survey and elsewhere in Africa (see Section 2.4 above). No differences in the nutritional status of the children were associated with ethnicity.

Nearly half of all mothers of well-nourished children practiced some sort of commerce that presumably enabled them to gain and control their own income. Mothers of malnourished children tended to rely on agricultural production or on their husband's cash to acquire food. These differences were statistically significant (Fisher's Exact Test, $p<0.05$).

⁵ The mother of one child in Mopti was dead and the child was being raised by his maternal grandmother. Her characteristics have been included with those of the other mothers presented in the tables.

Table 5: Percent distribution of women by sociodemographic characteristics, according to nutritional status

Characteristic	Percentage well-nourished women (N=39)	Percentage malnourished women (N=39)
Age		
<25	27	52
25-34	46	41
>35	25	7
Marital status		
Married	95	92
Other	5	8
Formal education		
None	69	90
Some	31	10
Ethnicity		
Peulh	26	31
Dogon	23	28
Other	51	41
Occupation		
Commerce	46	26
Other	54	74
Total	100	100

Table 6 indicates that it is not only the availability of caretakers that seems to be associated with the child's nutritional outcome, but also a mother's social control over the caretaker in question. Even if the mother has at least one older daughter, there seems to be little association with the child's nutritional status. However, if the mother designated the chief babysitter for the child, there appears to be a positive, albeit statistically insignificant, association with the infant's well-being. In these cases, presumably the mother can give orders and directions as to how the child should be looked after.

In the cases in which the main surrogate caretaker was the child's paternal grandmother, a higher percentage of children were malnourished. More than half the malnourished children had their paternal grandmother as their main surrogate caretaker, compared with only 18 percent of the better nourished children ($\chi^2=12.36$, $df=2$, $p<0.01$). Similarly, if the mother-in-law was present in the household (even if she was not cited as the chief surrogate caretaker), a significantly higher percentage of children were malnourished (Fisher's Exact Test, $p<0.05$). Young mothers, more likely to have an elderly babysitter in the household, may not have the experience necessary to properly care for their child.

Household dynamics also appears to be important because having a co-wife with whom the mother can share household tasks and child care responsibilities appears to be positively associated with the child's well-being (although this finding was not quite statistically significant). Thus, a mother's social support and autonomy appear to be key factors in influencing the care and well-being of her child. This theme emerges consistently from the in-depth interviews presented below.

Table 6: Percent distribution of mothers by access to potential caretakers of index child and child's relationship with principal surrogate caretaker, according to nutritional status

Access to potential caretakers	Well nourished (N=39)	Malnourished (N=39)
Number of living daughters of mother		
None	21	28
One or more	79	72
Mother cohabits with mother-in-law		
Yes	31	54
No	69	46
Mother has cowife		
Yes	26	15
No	74	85
Mother reports that main surrogate caretaker is:		
Child's older sister	36	31
Child's grandmother	18	56
Other	26	13
Total	100	100

