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A Macroeconomic Study of the Effects of Promotion on the Consumption of Infant Formula in Developing Countries

Mary C. Gilly and John L. Graham

During 1975, Nestle and other infant formula manufacturers agreed to curtail promotion of their products in developing countries. This curtailment resulted in a decrease in consumption of infant formula (when controlling for other variables) in 79 developing countries. Thus a causal link between promotion and consumption of the product is supported by the data and macroeconomic analyses in the study.

Few issues have stirred more controversy among marketers, governmental organizations, and consumer activists than the Nestle's infant formula boycott of the late 1970s (see Cateora 1983; Sethi et al. 1985). The crux of the debate was the causal effect of promotion by manufacturers on the breast-feeding behavior of women in less developed countries. Nestle and other infant formula manufacturers strongly argued that their advertising and personal selling efforts did not influence women to stop breast-feeding their children. That is, the only effect of their promotional expenditures was to distribute market share among competitors, *not* to increase the size of the market (Nestle 1980). Several critics vehemently disagreed (for example, Schudson 1984; James 1983). The purpose of this study is to test these competing hypotheses. Examination of infant formula imports by 79 developing countries during the 1970s provides an answer to this debate.

The remainder of the article is divided into four sections. First, the literature pertinent to the study is briefly described, including a statement of hypotheses. Next, the methods used are discussed. Third, results are presented. The article concludes with an interpretation of the findings and implications for managers and policymakers.

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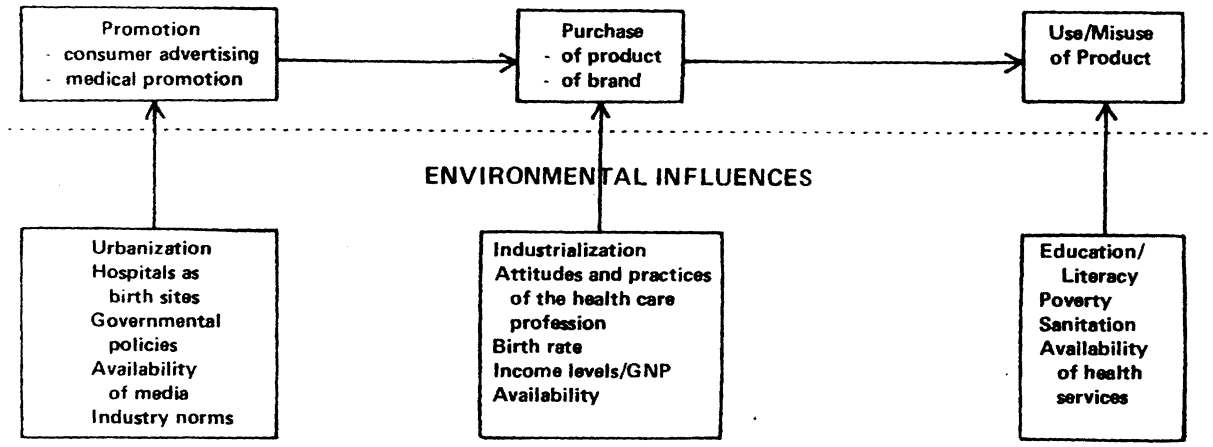
BACKGROUND LITERATURE

According to Sethi et al. (1986, p. 26), "all market actions have some nonmarket or indirect consequence for societies." In the case of marketing infant formula in developing countries, one consequence was an increased potential for infant malnutrition and mortality. No one has claimed that infant formula is an inherently bad or unsafe product (Pagan 1986). In fact, physicians consider infant formula superior to other breast-milk substitutes, such as powdered milk (Post 1978). But while a "mother can safely and adequately breast-feed a child in conditions of poverty and inadequate sanitation. . . , safety and adequacy cannot be guaranteed or achieved with any degree of consistency when bottle-feeding is attempted under the same conditions" (Post 1985, p. 116).

It is useful to discuss the issues surrounding this problem within the framework of marketing's effect on purchase and consumption and the environmental influences on this process. Figure 1 offers such a framework. Promotion is shown as influencing purchase of infant formula, which leads to use (or misuse) of the product. Environmental factors are shown as affecting all three components of the purchase and consumption process: promotion, purchase, and use. This framework serves as the basis for the

FIGURE 1

COMMERCIAL AND ENVIRONMENTAL INFLUENCES ON THE PURCHASE AND CONSUMPTION OF INFANT FORMULA



following discussion of the infant formula problem.

Promotion of Infant Formula

The promotion of infant formula products was "rampant and unchecked before 1970" (Post 1985, p. 116). Two types of companies produced and marketed formula, depending on the promotion strategy favored. Pharmaceutical firms (typically American) used medical promotion, while the food companies (typically European) preferred consumer advertising (Post 1978). Several environmental factors influenced the amount and type of promotional efforts. One example is the growing urbanization of the developing countries, which increased the food companies' ability to use consumer advertising efficiently (Post 1978). Hospitals became more popular birth sites, and newborns typically are fed at the hospital for the first few days. The medical community became a logical focus for the promotion of infant formula by pharmaceutical companies through free samples and other incentives (Sethi and Post 1979). Thus, the industry norms guiding the two types of marketers of infant formula in developed nations were reinforced by changes occurring there. Most governments of developing nations were cautious and reserved in their regulation of infant formula promotion (Post 1985), not wishing to alienate business or the medical community. Furthermore, the institutional mechanisms necessary for inspection and regulation generally were lacking (Sethi and Post 1979).

Purchase of Infant Formula

Consumer advertising and medical promotion contributed to the purchase of infant formula. Critics claimed that most of the advertising was misleading or used "hard sell" techniques to persuade mothers not to breast-feed (Sethi and Post 1979).

A general criticism of advertising is that it manipulates the minds of consumers so that they buy things they do not need or should not have (Schudson 1984). This has been the reasoning behind the ban on cigarette advertising on television (McGuinness and Cowling 1975) and the proposed ban on beer and wine advertising (Hume 1985). The argument that promotion shapes consumers' desires has also been the basis for the censure of marketers of infant formula in developing countries (see James 1983; Muller 1975). It was claimed that they were overpromoting their products to poor, uneducated people living in economic and hygienic conditions which made appropriate usage of powdered formula almost impossible (Sethi et al. 1985). According to critics, marketers were contributing to, if not responsible for, women opting for bottle-feeding rather than

breast-feeding, resulting in infant sickness and death.

In their defense marketers maintained that advertising cannot manipulate consumers because it is ineffective or only modestly influential in changing consumption habits. Promotion seeks to change not people's product choices but their *brand* choices (Schudson 1984). In a public relations pamphlet, Nestle (1980) made just such a claim regarding the influence of promotion on breast-feeding and the use of infant formula:

> QUESTION: Doesn't the promotion of infant formula in developing countries lead to lower levels of breast-feeding?
>
> ANSWER: The best evidence we have to date shows quite the opposite—the promotion of infant formula is *not* related to less breast-feeding in developing countries.
>
> The WHO Collaborative Breast-feeding Study (1979), which interviewed more than 23,000 mothers in nine nations, showed *no* association between breast-feeding decline and formula promotion. Of fundamental importance is the fact that the WHO Collaborative Study, in reporting reasons why mothers from nine countries did not breast-feed or stopped breast-feeding, listed the main factors as insufficient milk, maternal illness, infant illness, and new pregnancy. *Not once was any commercial factor even mentioned.*

Thus, the defenders of this view would point to other environmental factors that contribute to demand for infant formula and the decline in breast-feeding. For example, the industrialization of the developing countries, which has caused a westernization of social mores and has increased the need for mobility in employment, has been suggested as a contributing factor. It was a simple matter for mothers to breast-feed in an agricultural setting, but most places of industrial employment do not provide facilities for nursing (Sethi and Post 1979). The attitudes and practices of the health care profession also have been cited as factors (Benton et al. 1978). Doctors, nurses, and clinicians, as well as the policies of hospitals and clinics, often endorsed the use of infant formula. In many hospitals, newborns were routinely bottle-fed regardless of whether the mother planned to breast-feed (Sethi and Post 1979). Rising birth rates and income levels also increased potential demand.

A third view of the effects of advertising on purchase is offered by Schudson (1984). He claims that under certain conditions advertising can have a significant effect on sales and, furthermore, may influence cultural life even when it does not do much in the way of selling goods individually. While Schudson feels that advertising is generally ineffective, he believes some groups are particularly vulnerable to advertising. Among these are citizens of developing countries, due to poverty and illiteracy, lack of governmental consumer protection, and lack of personal experience with products. He said this about infant formula: "The powers of marketing here—through the medical professionals as much or probably more than through direct advertising—influence consumer choice" (1984, p. 125). Likewise, Farley, Louis, and Reddy (1980) report consumption of weaning foods in Sri Lanka to be positively influenced by direct mail advertising and free samples.

James (1983) supports this latter view, stating that multinationals use promotional techniques in competing for the mother's initial choice. Once committed to bottle-feeding, mothers then seek reinforcement of the correctness of their decision. James hypothesized that if the infant becomes ill, cognitive dissonance theory predicts that anxiety will be aroused. Because switching to breast-feeding may be impossible at that point, the mother must reduce anxiety by denying the association between infant formula and the baby's illness, thus perpetuating the influence of promotion on consumer choice of infant formula.

In summary, on the one hand, some authors suggest that promotion/advertising is ineffective in increasing product demand and only distributes demand among brands—for our purposes, a null hypothesis. On the other hand, particularly in the case of marketing infant formula in developing countries, other researchers suggest that promotion is effective in increasing product demand. The hypotheses considered in this study are:

H_0: Consumption of infant formula is unrelated to changes in promotional efforts of manufacturers in developing countries. Or, sales of infant formula in developing countries during 1972-1974 were no different from those during 1976-1978.

H_1: Consumption of infant formula is positively related to changes in

promotional efforts of manufacturers. Or, sales of infant formula in developing countries were higher during 1972-1974 than during 1976-1978.

The rationale for choosing the specified test periods is delineated in the Methods section.

Product Use/Misuse

Although not specifically addressed in this study, a brief discussion of the factors causing misuse of infant formula is pertinent. Consumer research typically focuses on product and brand choice, but it is important that marketers consider how consumers *use* products as well as how they purchase them (Nicosia and Mayer 1976). The infant formula controversy highlights this importance dramatically. The following quotation from Post (1985, pp. 127-128) concisely summarizes the effect of environmental factors on consumers' use of infant formula:

> The reason that children die in developing nations is not because infant formula is a bad product. Rather, there is an environment of poverty, illiteracy, inadequate sanitation, unhealthy water and limited health services that create dangerous conditions for the use of formula. Marketing did not create these conditions, but marketing was a more *actionable* aspect of the problem than poverty, water or education. Moreover, the manufacturers were placing their products in the stream of commerce without attempting to find out who actually used them, under what circumstances, and with what consequences.

Post went on to say that industry executives admitted at later hearings that their firms had done no research following up the purchase of their products. Thus, poor understanding of product use led to infant death and controversy.

METHODS

The Independent Variable

Measurement of the independent variable in this study, promotional efforts by infant formula manufacturers, is most difficult. Information regarding actual expenditures and/or marketing practices has been closely guarded by the firms because of their involvement in lawsuits associated with the controversy. In 1975, however, the leading companies in the industry agreed to a fundamental curtailment of promotional efforts in developing countries. The events leading up to this crucial change are described below.

As can be seen in Exhibit 1, the controversy regarding promotion of infant formula in developing countries was sparked in 1970 at a conference in Paris sponsored by a United Nations agency, the Protein Advisory Group (PAG). A key recommendation of PAG stated: "It is clearly important to avoid any action which would accelerate the trend away from breastfeeding" (PAG 1972). Jelliffe (1971), a consultant to PAG at the Paris conference and then director of the Caribbean Food and Nutrition Institute, claimed that the marketing practices of the infant formula manufacturers were the "major factor" contributing to the decline in breast-feeding and the associated increase in consumption of breast-milk substitutes. From these beginnings the controversy grew to be one of the most debated issues of the 1970s, including lawsuits in several countries, international consumer group protests and boycotts, and even U.S. Senate hearings. The history of the controversy is interesting in and of itself and is well documented by others (see Sethi et al. 1985). The focus of this article is not the controversy, however, but the promotional behaviors of the infant formula manufacturers.

Prior to 1970 almost all the manufacturers used a wide variety of promotional techniques in developing countries. Six were considered most objectionable by the several critics (McComas et al. 1983; Nestle 1983): advertising to the general public; samples given to new mothers; personal selling through mothercraft workers (that is, women presenting themselves as nutritional experts, often dressed in nursing uniforms); point of sale advertising; the use of commissions/bonuses for sales; and copious samples to physicians.

In response to the criticism of Jelliffe, PAG, and other consumer activists, formula manufacturers began to examine their marketing in developing countries. Nestle (1983, p. 1), the industry leader (largest market share worldwide), reports beginning "to review its marketing practices on a region-by-region basis" in the early 1970s. In 1974 in the United States Bristol-Myers was the subject of a shareholder lawsuit demanding information regarding the firm's marketing practices in developing countries

EXHIBIT 1

IMPORTANT EVENTS IN THE INFANT FORMULA CONTROVERSY

Date(s)	Event	Reference
1867	Henri Nestle introduces first commercially produced infant formula	Post (1978)
1945-1959	Infant formula sales soar in industrialized countries because of post-World War II baby boom	Post (1978)
1960s	Birth rates in industrialized countries decline, manufacturers begin "rampant and unchecked" promotion of bottle-feeding in developing countries	Post (1985)
1970	At U. N. conference in Paris, Jelliffe blames formula manufacturers for infant deaths in less developed countries	Sethi et al. (1986)
Early 1970s	Nestle begins to review marketing practices on a region-by-region basis	Nestle (1983)
1972	Abbott/Ross introduces code to control promotions practices	Beaver and Silvester (1982)
1974	Bristol-Myers in the United States is subject to shareholder lawsuit demanding information regarding formula promotion in developing countries	McComas et al. (1983)
1974	First public identification of issue with publication of *The New Internationalist* and *The Baby Killer*	Sethi and Post (1979)
1974-1978	Nestle phases out all direct promotional practices	Armstrong (1985)
1975	Nestle trial in Switzerland and shareholder resolutions filed in the United States	Sethi and Post (1979)
1975	Formation of International Council of Infant Food Industries (ICIFI) and promulgation of code of marketing ethics	Sethi and Post (1979)
1976	Borden stops all promotion and sales of infant formula in Hong Kong and Taiwan	Post (1978)
1977	Boycott against Nestle begins	Pagan (1986)
1978	U.S. Senate hearings regarding United States firms' role in controversy	
1981	First developing country government (Kenya) takes legislative action to curtail promotion of infant formula	James (1983)
1981	World Health Organization passes code on marketing breast-milk substitutes	Pagan (1986)
1982	Nestle creates Nestle Infant Formula Audit Commission (NIFAC)	Pagan (1986)
1984	International Nestle Boycott Committee announces termination of seven-year boycott	Post (1985)

(McComas et al. 1983). Post (1978) reports that Borden stopped all advertising for its infant formula in Hong Kong and Taiwan in 1976. Beaver and Silvester (1982, pp. 2-3) state: "The companies had responded quietly but continuously. Nestle stopped direct contact between employees and mother and introduced stringent controls over sampling. Abbott/Ross introduced a code in 1972 and by the mid-1970's there was a general tightening up."

At a meeting sponsored by PAG in Singapore in 1974, executives from several formula manufacturing companies first discussed the possibility of forming an industry council to consider marketing practices in developing countries. In 1975 the International Council of Infant Formula Industries was formally organized in Zurich, Switzerland, bringing together eight of the largest U.S., European, and Japanese firms, Nestle among them. One of their first actions

was to develop a code of conduct embodying the principles of the 1970 PAG recommendations. Beaver and Silvester (1982) agree with Armstrong (1985, p. 8): "From 1974 to 1978, Nestle phased out all direct promotional practices."

Considering the published information summarized in Exhibit 1, 1975 is chosen as the critical year when the industry, based on previous examination of marketing practices, began to curtail its marketing efforts. That is, promotion by the infant formula manufacturers in developing countries was greater immediately before than immediately following 1975. Thus, a dichotomous independent variable is defined - more promotional effort before 1975 versus less promotional effort after 1975.

Imports as an Indicator of Consumption

Direct measurement of infant formula consumption in low income countries is not possible using publicly available data. Post (1978, p. 223) explains: "There is no precise information about the world market for infant formula products. Moreover, virtually no individual countries require disclosure of information from manufacturers or sellers by line of business." Post does venture an estimate. Based on extrapolations from bits of information from three U.S. companies, he speculates sales in less developed countries in 1978 to be approximately $600 million. Using company data, Cox (1978, p. 243) provides a much lower estimate for the same period. "The prepared infant formula market in the one hundred countries generally considered to be third world is about U.S. $350,000,000."

Infant formula imports *are* tracked by most countries, and those data are made available through the United Nations. Imports (SITC 048.82) to the 79 low income countries included in our data base amounted to $148.4 million in 1978. Thus, using Cox's lower estimate of the total market, imports appear to account for about 54% of infant formula consumption, that is, $148.4 million/($350 million x (79/100)).

Obviously, imports do not take into account local production, but they are directly related to strategies common to several firms. Post (1978) reviewed the operations of formula producers and concludes that in addition to production in the United States and other industrialized countries, a common approach is to produce in a third country or region combined with export distribution. Indeed, Stafford (1978) reports that his firm, Wyeth International, manufactures formula in the United States and 14 foreign countries and markets the product in 90 countries. Since formula production is a high technology process (Post 1978), requiring the strictest sanitation (Stiegler 1985), it tends to be concentrated in the industrialized countries. Moreover, when multinationals invest in production facilities, they favor larger markets; for example, American Home Products announced in 1978 that it would be opening a new plant for infant formula production in Indonesia (Post 1978). Thus, it is reasonable to assume that imports best reflect consumption in smaller, low income countries.

Dependent Variable

The dependent variable considered in this study is infant formula imports (IFI) (SITC 048.82) as a percentage of total food imports (TF) (SITC 0). These data were obtained from the *United Nations Trade Statistics Annual* (1969-1980) for the 79 low income countries listed in Exhibit 2. The data are summarized in Table 1.

This percentage of food imports measures controls for several potential monetary and economic biases. First, because both import figures (formula and food) are reported in dollars, inflation is controlled by the division. Second, and perhaps more important, economic performance variables in the countries and in the world economy might be expected to influence imports of food and formula in a similar manner. Without this control, then, fluctuations in demand/consumption of infant formula might be attributed to economic conditions, such as overall increases in world trade, changes in GNP, import restrictions, or foreign exchange availability in the individual countries. These issues are further discussed in sections to follow.

Hypothesis Tests

One-tailed T-tests were used to test the hypotheses. Imports of formula during 1972-1974 and 1976-1978 were calculated for each country, and the pairs of consumption values

EXHIBIT 2

COUNTRIES INCLUDED IN THE STUDY

Bolivia[a]	Congo	Tanzania
Brazil	Gabon	Upper Volta
Chile[a]	Algeria	Zaire
Colombia	Angola	Zambia
Ecuador[a]	Egypt[a]	Cyprus[a]
Mexico[a]	Ethiopia	Iran[a]
Peru[a]	Djibouti	Iraq
Uruguay[a]	Gambia	Jordan
Venezuela	Ghana	Lebanon
Belize	Guinea	Oman
French Guyana[a]	Ivory Coast	Syria[a]
Surinam	Kenya[a]	Yemen
Costa Rica[a]	Liberia	D. Yemen
El Salvador[a]	Madagascar	Bangladesh
Guatemala	Mali	Burma
Honduras[a]	Mauritius[a]	Hong Kong[a]
Nicaragua	Morocco	India
Panama[a]	Mozambique	Indonesia
Barbados[a]	Niger	S. Korea
Guyana	Nigeria	Malaysia[a]
Jamaica[a]	Rwanda	Pakistan
Trinidad Tobago	Senegal	Philippines[a]
Dominican Republic	Sierra Leone	Singapore
Haiti	Somalia	Sri Lanka
Cameron	S. Africa[a]	Thailand[a]
Central Africa	Tunisia[a]	

[a]Birth rate statistics available (United Nations 1983).

TABLE 1

IMPORTS OF INFANT FORMULA AND FOOD

Year	Infant Formula Imports (IFI) (SITC 048.82)[a]	Food Imports (TF) (SITC 0)[b]
1969	21.6	2.38
1970	48.3	2.99
1971	-	-
1972	76.4	3.80
1973	101.0	6.41
1974	99.4	9.72
1975	107.4	10.80
1976	117.5	9.19
1977	125.5	10.64
1978	148.4	12.62
1979	157.5	15.49

NOTE: See Exhibit 2 for a listing of the countries.

[a]Imports ($ millions) of "diet, infant cereal preps" (SITC 048.82) to 79 countries (*World Trade Annual* 1969-1979).
[b]Imports ($ billions) of "Food all categories" (SITC 0) to 79 countries (*World Trade Annual* 1969-1979).

were compared across the two periods. Three-year periods were selected for two reasons. First, Salvatore (1983), Buzzell and Wiersema (1981), and Weede (1983) all argue for measures of variables averaged over a number of years. Feder (1982, pp. 63-64) adds: "Annual data include substantial random effects which tend to be eliminated by the procedure of averaging. The existence of lagged responses is another element which becomes less severe when averages rather than annual data are used." Second, data for 1971 are not available, thus limiting the test to the three years before 1975 and a comparable period after 1975.

Please note that we considered aggregating the data across the 79 countries and doing a regression analysis over the ten periods for which we have data (1969 to 1979, less 1971). Then a dummy variable for promotion (0 = pre-1975, 1 = post-1975) might compete with any other possible independent variables to explain the variance in infant formula imports. However, such an approach is precluded by two problems. First, ten data points give almost no statistical power, particularly with a five-plus-variable regression equation. Second, as mentioned above, the arguments for pooling the data *across time periods* are substantial. Moreover, the pairwise analysis is appropriate for the data, given that *imports 1972-1974* and *imports 1976-1978* for each country are not independent. If they were independent, then analysis of variance or discriminant analysis would have been possible and more appropriate. The method we have chosen takes advantage of all the information in the data, across all 79 countries.

RESULTS

The competing hypotheses are:

H_0: Consumption of infant formula is unrelated to changes in promotional efforts of manufacturers in developing countries. Or, sales of infant formula in developing countries during 1972-1974 were no different from those during 1976-1978.

H_1: Consumption of infant formula is positively related to changes in promotional efforts of manufacturers. Or, sales of infant formula in developing countries were higher during 1972-1974 than during 1976-1978.

As indicated in Table 2, Hypothesis 1 is supported by the analysis. That is, imports of infant formula (IFI/TF), controlling for several factors, were lower in 1976-1978 than in 1972-1974. Consumption of infant formula was found to be positively related to changes in industry promotional efforts, and the relationship was statistically significant ($p < 0.05$).

DISCUSSION

Conclusions

The information in Table 2 strongly suggests that infant formula imports (IFI/TF), controlling for several economic factors in the 79 countries, were reduced by the curtailment of promotion. The empirical evidence in this study supports the views of Jelliffe (1971), Schudson (1984), and James (1983) that promotion affected overall consumption of infant formula and, by implication, breast-feeding behavior.

Indeed the model proposed in Figure 1 is supported by our data and analysis. That is, the infant formula manufacturers aggressively promoted their products, and consumption was thereby increased in environments conducive to misuse. Because the manufacturers took actions to reform and curtail promotion in low income countries, inappropriate purchase and use of infant formula was also curtailed. The tragedy here is that all the companies did not respond to their critics in an even more prudent and timely manner.

TABLE 2

RESULTS OF T-TESTS, Infant Formula Imports (SITC 048.82) as a Percentage of Food Imports (SITC 0)

	All 79 Countries	Sample 31 Countries[a]
Mean (1972+1973+1974)/3	2.10%	2.16%
Mean (1976+1977+1978)/3	1.75%	1.68%
T Value	2.14	2.40
d.f.	78	30
One-tail Probability	.018	.011

[a] 1979 population less than five million.

In addition to statistical significance, the results also provided a measure of practical significance. That is, the reduction of infant formula imports between the two three-year periods was 20%—calculated (2.10-1.75)/1.75 (see Table 2). In other words, had the manufacturers maintained their much criticized promotional practices through 1978, imports to the 79 countries in 1978 might have been $178 million instead of $148 million, other things being equal.

Alternative Explanations

Several alternative explanations for the results reported above warrant examination.

1. It might be argued that the activities of the various protest groups influenced consumers or governments to reduce use of infant formula after 1975. Indeed, this was the time when the Nestle controversy began to gain widespread attention in the popular press. However, the protests and publicity were largely confined to the industrialized countries and did not reach Third World consumers. Indeed, James (1983, p. 165) reports: "Not until April 1981 (with the introduction of a code of ethics in Kenya) was legislative action taken in a developing country against the manufacturers of powdered baby milk. See *The Sunday Times*, London (26th April, 1981)."

2. The decline of imports of infant formula (IFI/TF) reported in the Results section may have been caused by changes in birth rates across the time periods. However, as can be seen in Table 3, the change in IFI/TF was unrelated to changes in birth rates over the test period for the 36 countries for which data were available.

3. Perhaps imports were influenced by changes in individual countries' economic conditions. As can be seen in Table 3, the decline in IFI/TF was found to be unrelated to changes in GDP and/or changes in foreign exchange available during the test period. Apparently, these economic conditions had no systematic influence on infant formula imports.

4. It may be that the decline in imports reflects increased local production. As mentioned previously, the manufacturers favored investments in production facilities in the larger countries. Therefore, we retested the hypotheses using a subset of the smallest countries (1979 population less than five million). As can be

TABLE 3

COMPETING EXPLANATIONS FOR THE CHANGE IN IMPORTS OF INFANT FORMULA AS MEASURED BY IFI/TF (1976+1977+1978-1972-1973-1974)/3

Independent Variables	Pearson Correlation Coefficients
% Change in Birth Rates	
$\frac{\text{Births (1976+1977+1978-1972-1973-1974)}}{\text{Births (1972+1973+1974)}}$	.098[a] (N=36)[b]
Source: *Demographics Yearbook of the United Nations*	
Change in GDP Index	
$\frac{\text{GDP Index (1976+1977+1978-1972-1973-1974)}}{3}$	.048[a] (N=59)[b]
Source: *International Financial Statistics*	
% Change in Available Foreign Exchange (deflated)	
$\frac{\text{Foreign Exchange (1976+1977+1978-1972-1973-1974)}}{\text{Foreign Exchange (1972+1973+1974)}}$	- .081[a] (N=66)[b]
Source: *International Financial Statistics*	

[a]Not statistically significant ($p < 0.10$).
[b]Sample sizes limited by data available.

seen in Table 2, the decline in formula consumption (IFI/TF) is still statistically significant. Thus, increased local manufacturing does not offer adequate explanation.

5. Other marketing mix decisions, besides promotional practices, may have influenced consumption. However, promotion was the focus of the controversy, the manufacturers' remedial actions, and this study. Indeed, had the firms segmented their markets more carefully and distributed the product more narrowly, or had the product been sold in diluted form (as is done now in the United States), perhaps the negative consequences of formula sale would have been dramatically reduced. Unfortunately, no data are available with which to address such broader questions.

6. One reviewer suggests that infant formula is supplied as part of U.S. foreign aid, which will not show up in import data. Since the government sources we checked provided no information about infant formula as part of foreign aid, this last challenge to the validity of our results remains unanswered.

Indeed, still other challenges may be offered, but our evidence and results must be evaluated in the context of the difficulty of investigating the negative consequences of corporate behavior. Key, even conclusive, information *is* available in company records–promotion expenditures and sales histories–but companies are unwilling to share it (Post 1978). Until such data are made available for close and objective scrutiny, studies such as this one must suffice. Until companies provide evidence to the contrary, one must conclude that their promotion of infant formula led directly to increased consumption of the product in environments where its misuse led to sickness and death. Post (1978, p. 120) makes a similar comment regarding his research for the U.S. Senate hearings in 1978:

> Data relating to the infant-formula industry is difficult to acquire. Most information on sales volume, profits, market share of manufacturers, and even the manner in which firms do business is regularly denied researchers because of its proprietary nature. Published information is very limited in the United States, and even more scarce in developing nations. This void is frustrating to

researchers such as myself; it also frustrates those who want to understand the magnitude of the problems on which these hearings are focused.

Implications for Managers and Policymakers

The results of this study suggest that advertising and promotion can influence consumer behavior in socially undesirable and unintended ways. Despite the good intentions of marketers, advertising can have negative consequences. As suggested in Figure 1, marketing strategies must be evaluated in view of the environment in which they will be executed. In the case of infant formula, promotion strategies designed for *industrialized* countries resulted in sickness and death for infants in *less developed* countries. The context of promotion, purchase, and product use must be taken into account by producers and distributors. Managers marketing products with potential usage problems should attempt to anticipate these and do careful research in test markets. Furthermore, marketers should not ignore criticism from responsible sources but instead should thoroughly investigate their own culpability. Finally, as Nicosia and Mayer (1976) advocate, managers must measure and take responsibility for all the effects of their advertising and not just focus on sales.

To the extent that firms fail to recognize their responsibility, policymakers will take action. The World Health Organization's *International Code of Breastmilk Substitutes* (Anderson 1981) is the most recent example. The ban of cigarette advertising from U.S. television and the Federal Trade Commission's investigation of advertising of sugared cereals (leading to more stringent industry self-regulation) also come to mind. In a similar vein is the present controversy over beer and wine television commercials.

In this last case the arguments bear a striking resemblance to those which arose in the Nestle controversy. The critics suggest that TV advertising increases overall consumption of alcoholic beverages and, in turn, alcoholism. Brewers and vintners counter that TV advertising does nothing more than serve to distribute market share (Hume 1985). Critics maintain that TV advertising influences underage drinking; advertisers argue that the ads are carefully targeted toward adults. Likewise, Nestle argued that its advertising was aimed at the educated and high income consumers in developing countries, while their critics suggested that baby formula ads reached other segments. Finally, *60 Minutes* reporters asked teenage drinkers if TV advertising influenced them to drink, and they said no. Similarly, Nestle cited the World Health Organization study (1979) wherein 23,000 mothers in nine developing countries were asked what induced them to stop breast-feeding. Not once was advertising mentioned. In both situations, one might ask why consumers would be expected to admit to, or even be conscious of, their response to commercial advertising.

Beer and wine advertisers may be operating under the assumption that because one part of the market can use the product safely, all consumers can. A similar assumption was made by the infant formula manufacturers. Just as Figure 1 shows that environmental influences affect purchase and use of infant formula in developing nations, environmental influences may affect the purchase and use of alcoholic beverages by certain groups (for example, teenagers) such that a great potential for misuse (alcoholism, drunk driving) exists.

The similarities in the arguments indicate possible applications of our findings concerning infant formula to the case of beer and wine advertising. The latter may be influencing product consumption rather than simply brand selection, although the study for Anheuser-Busch reported by Hume (1985) concludes the contrary. Further research is needed to learn more about the relationship between promotion, product and brand choice, and product use. This is particularly true in cases where promotion may have undesirable effects on society as well as positive effects on sales.

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