

# SATISFYING CONSUMERS' "GREEN" WANTS: AN IMPETUS FOR EDUCATION<sup>1</sup>

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## ABSTRACT

Customer satisfaction is one of the most important results that should be sought after in a firm's marketing strategy. With an increasing number of consumers considering themselves to be "environmentalists," and an even greater number making purchase decisions based upon the perceived "greenness" of a product, wood products producers can no longer afford to neglect consumers' satisfaction with their products on the "green" dimension. Consumers' "green" wants should have an increasing impact on wood products that do not satisfy these wants. This paper provides an example of consumers' green wants for a wood-based product, and how misperceptions of the environmental impact of such a product can decrease satisfaction on the "green" dimension. Implications are drawn for wood products marketers, and for those in positions to educate consumers about the environmental friendliness of wood products.

*Keywords:* Customer satisfaction, diapers, green marketing, consumer education.

## INTRODUCTION

As manufacturers strive to provide products that meet customers' requirements, they often place the achievement of long-run customer satisfaction high on their list of strategic priorities (Day and Wensley 1988). Day and Wensley (1988) believe so strongly in customer satisfaction as to consider it, along with loyalty, to be more significant than market share; and they propose a "market back" orientation in which customer-focused assessments of de-

sired benefits are used to drive company performance improvements. With an increasing number of consumers considering themselves to be "environmentalists" (Goldman 1991) and 90% of CEOs agreeing that the environmental challenge will be a central issue of the next century (Wheeler 1992), consumer goods producers can no longer afford to neglect consumers' satisfaction with their products on the "green" dimension.

There should be little doubt that the green movement is having an increasing impact on the wood products industry. From harvesting, manufacturing and distribution, to use and disposal issues, consumers' environmental concerns are predicted to be one of the significant trends in the wood products marketplace

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in the 1990s (Sinclair 1992). As concern for the environment increases, there will be increased scrutiny of products that are believed to have a detrimental impact on the environment (Ottman 1992a). Mater (1992) notes that this type of scrutiny will affect the acceptability of wood products, and can even lead to boycotts. Given the increasing impact of "green" consumers, it is surprising that a review of the literature reveals little in the way of research done to assist the industry to better understand and satisfy these consumers.

Thus, the purpose of this research is to provide an example of consumers' "green" wants for a wood-based product, and to utilize this example to examine the need both to satisfy consumers' green wants and to educate consumers as to the environmental friendliness of wood products. Diapers were used in the research because they represent a prime example of a product that provides insight into environmentally related purchasing attitudes and related behaviors of consumers who are confronted, at least in part, with a decision based upon a product's environmental characteristics. Diaper decision-making also provides an opportunity to examine a situation in which consumers' attitudes toward the performance of a wood-based product may be formed through actual experience with the product, and concurrently, consumer environmental attitudes toward the product may be open to manipulation due to the difficulty of gauging the long-term environmental impacts of this consumptive behavior.

This paper will begin with a description of various marketing concepts and their relevance to customer satisfaction. Customer satisfaction will also be reviewed to underscore its importance to a firm's performance and profitability. Next, a brief background on diapering trends and impacts will be provided. Following the empirical demonstration sections, the paper will discuss conclusions and implications for industry participants, including the need for increased education of consumers by industry, trade associations, and others.

## BACKGROUND

### *The marketing concept and customer satisfaction*

The marketing literature provides for the following five alternative concepts under which organizations can conduct their business activities: production, product, selling, marketing, and societal marketing concepts (Kotler and Armstrong 1991). These concepts are useful to help organizations carry out the tasks needed to achieve desired exchanges with their target markets. Specifically, they provide a framework for decisions regarding what weight should be given to the interests of the organization, its customers, and society. Because the interests of these groups, along with other stakeholders, are often in conflict, it is critical that organizations understand these concepts.

According to the *production concept*, consumers will favor products that are both available and highly affordable; and organizations should therefore focus on improving production and distribution efficiency. This concept is one of the oldest philosophies guiding sellers, and was followed by the early wood products industry (Sinclair 1992). This concept was appropriate then because of such factors as low-cost and plentiful timber, more limited competition, and strong demand. The *product concept* is similar and yet it extends the notion of the type of good that consumers desire. According to this concept, consumers favor products that offer the best quality, performance, and features; and thus the organization should focus on making continuous production improvements.

The *selling concept* can be thought of as "getting rid of what you have." This concept holds that consumers will not buy enough of a product unless intensive promotional efforts are used to induce purchase. The aim here is simply to get a sale, not to worry about post-purchase satisfaction. Firms utilizing this concept would seek profits through increased sales.

An important step forward from the selling concept is the *marketing concept* (Bennett 1988). This concept is widely used by many

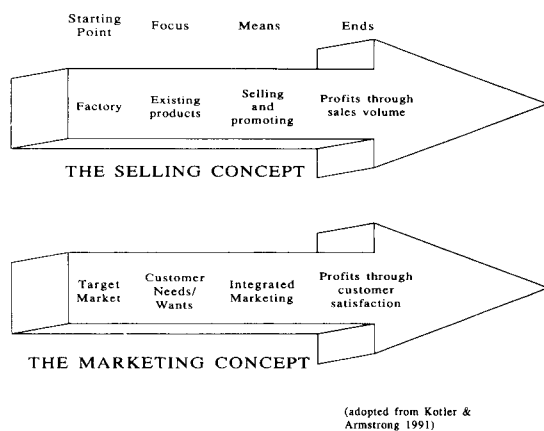


FIG. 1. Comparison of selling versus marketing concepts.

successful companies such as Proctor & Gamble, Disney, and McDonald's, and holds that determining and satisfying the needs and wants of target markets more effectively and efficiently is the key to achieving organizational goals. Figure 1 provides a contrast between the selling and marketing concepts. As opposed to the selling concept, the marketing concept starts with a well-defined market and focuses on the customer's needs. By utilizing an integrated effort between all parts of the organization, the firm will earn profits through customer satisfaction.

Customer satisfaction should be viewed as a major outcome of marketing activity, thus serving to link processes culminating in purchase and consumption with such postpurchase phenomena as attitude change, repeat purchase, and brand loyalty (Churchill and Surprenant 1982). Some authors (e.g., Kotler 1984) even consider customer satisfaction to be the best indicator of a company's future profits. This is in part due to companies with weak customer satisfaction being forced to compete from the standpoint of price (Fornell 1992).

The newest of the five concepts is termed the *societal marketing concept*. This concept extends the marketing concept by maintaining that satisfactions should be delivered in a manner that improves the consumer's as well as society's well-being (Kotler and Armstrong

1991). A company following this concept would consider society's interests as well as its own profit-making interests.

Ottman (1992b) notes that while quality, price, and convenience are still foremost in consumers' purchasing decisions, a product's perceived "greenness" is quickly becoming an important purchasing criterion. Greenness may include a variety of somewhat intangible attributes such as raw materials used, the environmental impacts of manufacturing, the quantity and recyclability of packaging, and product disposal characteristics. Thus, a demand function for a consumer product could be shown as:

$$Q = F(p, g, x_1, \dots, x_n) \quad (1)$$

Such a demand function postulates that the demand,  $Q$ , for a particular product is a function of how well its price,  $p$ , its "greenness,"  $g$ , and the other product characteristics,  $x_1, \dots, x_n$ , satisfy customers. These product characteristics will include both physical product attributes as well as nonphysical attributes, the latter reflecting dimensions of image and product performance (Dickson and Ginter 1987). If this demand function can be accepted, we may then further hypothesize that a product perceived to be low on "greenness" may not satisfy its customers as well, and hence may experience lower demand even though it may perform highly on the other characteristics.

As noted earlier, it is increasingly necessary to satisfy consumers' "green" wants as well as their desires for product performance (Peattie and Ratnayaka 1992). These green wants are not focused solely on the physical product, but also extend to a product's packaging, reuse potential, or even to the social responsibility of the manufacturer (Ottman 1992a). For those wood products firms not addressing and satisfying consumers' "green" product wants, there may exist a "green gap" between the perceived product offering and those wants and desires. It is, therefore, important for the wood products industry to understand how such a green gap between a given wood product, or

wood products in general, can impact the demand for these products.

*U.S. diapering trends and impacts*

Prior to 1961, when Proctor & Gamble test-marketed the first modern-day disposable diaper (Samuelson 1990), American parents had only one viable method of diapering available to them—to diaper their newborn or toddler with cloth diapers laundered either in the home or, in some cases, by a professional diaper service. Proctor & Gamble's retail sales that first year were \$2.5 million, representing about 1% of all diapers sold in the United States. In 1970, the first year of national distribution, 25% of all diapers sold in the United States were disposables, and by 1990 approximately 90% of total diaper sales were disposables (Hanna 1990; Samuelson 1990). Concern over the environmental implications of disposable diaper use may be responsible for a return to cloth diapering by a small, but perhaps growing, segment of U.S. parents. This possible resurgence is evidenced by the diaper services industry, which reported sales of \$250 million in 1989, up 38.5% from 1988.

Environmental responses by the disposable diaper industry, aimed at assuaging the demands of environmentally conscious consumers, have included substantial reductions in the amount of material and packaging used in their products. The development of superabsorbent polymers was originally intended to provide parents with thinner, more absorbent diapers able to keep their children dry and comfortable. The more extensive use of superabsorbent technology, however, coupled with reduced and/or biodegradable packaging, has been aimed at reducing the volume and weight of diapers and packaging materials entering the solid waste stream (Crow 1990). Proctor & Gamble, for example, promotes the fact that between 1986 and 1992 it reduced the bulk of its disposable diapers by almost 40% (Proctor & Gamble 1992).

*Fluff pulp impacts.*—Kotler (1984) defines derived demand as “the demand for certain goods and services which is not primary but

derived from the demand level for other goods into which their goods enter.” Retail sales of disposable diapers are an example of primary demand for a consumer product, while the sale of absorbent fluff pulp to disposable diaper manufacturers is an example of derived demand. The demand for fluff pulp, an industrial product, is therefore dependent on changes in consumer buying behavior for disposable diapers (as well as adult incontinent and feminine hygiene products) and technological advances by manufacturers that influence the relative amount of wood fiber used in each of these products.

The growth of the disposable diaper industry in the United States has, in turn, substantially increased demand for absorbent fluff pulp. Annual increases in fluff pulp production, averaging 7% to 8% during the early to mid-1980s (making fluff pulp the largest growing segment of the U.S. market pulp industry), were due largely to increased consumer demand for disposable diapers (Anon. 1989). Approximately 75% of U.S. fluff pulp consumption in 1993 is expected to be in the manufacture of disposable diapers (Smith 1993).

The introduction and continued development in the use of superabsorbent technology by the disposable diaper industry have had significant implications for the U.S. fluff pulp industry. The use of superabsorbents reduces the need for large amounts of absorbent fluff pulp, which is the “bulk” of a disposable diaper. Thus, it is increasingly important for pulp producers to understand the impacts that “green” consumers can have on their product.

*Environmental impacts.*—Much recent attention has been paid to the impact of disposable diapers on municipal solid waste (MSW), which refers to household and commercial solid waste delivered to a landfill or resource recovery facility. Although used by only 7% of all U.S. households, the 18 billion disposable diapers discarded each year accounted for approximately 2% of municipal solid waste and 3.5% to 4.5% of all household solid waste by weight; and it represented an estimated 3.6 million tons of waste in the United States in

1988 (Lehrburger 1988; Franklin Associates, LTD 1988). Moreover, the share of disposable diapers entering the solid waste stream is expected to increase as adult "diapers" fill a related need for the aging population, and recycling reclaims increasing amounts of other materials such as aluminum, glass, plastic, and paper from the solid waste stream (Lehrburger 1988).

#### EMPIRICAL DEMONSTRATION

##### *Sampling and respondent profile*

A systematic random sample of 3,000 U.S. households with children of ages three years or younger was used for data collection. This sample was chosen on an Nth name basis with every household having an equal and known chance of being selected (Mendenhall et al. 1986). After follow-up methods had been employed (Dillman 1978), a total of 1,245 usable surveys were returned. This produced a total response rate (calculated as the percentage of usable surveys returned from reachable and eligible households) of 53.8%.

A pretest was administered prior to final design of the questionnaire to check for biased, misleading, or confusing questions and to verify the quality and quantity of information received. The pretest involved three groups of people (Dillman 1978). These three groups included a sample of parents with children attending daycare centers in the Seattle metropolitan area, faculty from the University of Washington, and sponsors of the study (industry experts).

Comparisons with the overall U.S. population show our sample to be somewhat more educated than the U.S. adult population. Moreover, a much larger percentage of our sample (92.7%) reported that they were married or living with their partner as compared to the national average. According to the U.S. Bureau of the Census, only 77.1% of family households with children were headed by a married couple in 1988. Our unique sample (households in the U.S. with children of ages three-years-old or younger) should be kept in

mind when interpreting study results. Additional characteristics of our sample include: more than 90% of the fathers and 28.3% of the mothers were reported to be working full-time outside the home, with an additional 22.7% of mothers reported to be working part-time outside the home; more than 95% (1,184 of 1,242) of the respondents were women; the average number of children was 2.0; the average age of the parents was 29.8 years. Chi-square<sup>2</sup> tests of independence were performed on a variety of demographic variables for early versus late respondents (Fowler 1984). Only the ethnic background differed (at the 0.05 level) between early and late respondents, with a somewhat higher percentage of our sample being white.

##### *Results*

*Diaper use.*—Only 4.4% (54) of our respondents reported diapering solely with cloth diapers, while slightly less than 15% (184) of the parents used some combination of both cloth and disposable diapers. Thus, more than 80% (1004) of the respondents used only disposable diapers. These figures allow us to estimate that approximately 81% of all in-house diaper changes are made with disposables. This is calculated from our 1,242 respondents' estimates of the number of disposable diapers used (a mean of 29.8) and cloth diaper changes made (a mean of 7.0) by these "average" American parents in a seven-day week. Lehrburger (1988) has reported that just over 80% of all diaper changes in the United States are with disposables, thus confirming our usage results.

*Diaper decision-making.*—Two open-ended questions were asked to determine areas in

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<sup>2</sup> A chi-square procedure tests the significance of the differences observed between two categorical variables in a sample. The null hypothesis being tested is of independence between two variables. Stated differently, the two variables are considered to lack association with each other until proven otherwise. The null hypothesis is rejected when the chi-square test statistic shows with 95% confidence that associations between the variables in the sample reflect actual associations between the variables in the population.

TABLE 1. "What changes would improve diapering with disposable diapers?" (open-ended question; n = 950).

| Rank | Response                     | Current user group              |                                      |                        | Totals<br>(n = 950) |
|------|------------------------------|---------------------------------|--------------------------------------|------------------------|---------------------|
|      |                              | Disposable<br>only<br>(n = 778) | Cloth and<br>disposable<br>(n = 133) | Cloth only<br>(n = 39) |                     |
|      |                              | Number of responses             |                                      |                        |                     |
| 1    | Make them biodegradable      | 281                             | 43                                   | 17                     | 341                 |
| 2    | Lower the cost of diapers    | 194                             | 42                                   | 10                     | 246                 |
| 3    | Make safer for environment   | 139                             | 27                                   | 7                      | 173                 |
| 4    | Make recyclable              | 124                             | 40                                   | 7                      | 171                 |
| 5    | No improvements needed       | 72                              | 0                                    | 0                      | 72                  |
| 6    | Improve disposal options     | 42                              | 5                                    | 2                      | 49                  |
| 7    | Improve containment          | 42                              | 5                                    | 2                      | 49                  |
| 8    | Provide flushable liner      | 35                              | 0                                    | 0                      | 35                  |
| 9    | Improve absorbency           | 30                              | 0                                    | 0                      | 30                  |
| 10   | Remove chemicals/perfume     | 25                              | 2                                    | 0                      | 27                  |
| 11   | Minimize packaging           | 22                              | 0                                    | 0                      | 22                  |
| 12   | Make thinner/less bulky      | 15                              | 5                                    | 2                      | 22                  |
| 13   | Improve fasteners/taping     | 20                              | 0                                    | 0                      | 20                  |
| 14   | Improve overall quality      | 17                              | 0                                    | 0                      | 17                  |
| 15   | Provide more coupons         | 15                              | 2                                    | 0                      | 17                  |
| 16   | Remove guilt of using        | 15                              | 0                                    | 0                      | 15                  |
| 17   | Improve rash prevention      | 7                               | 2                                    | 0                      | 9                   |
| 18   | Make softer/more comfortable | 9                               | 0                                    | 0                      | 9                   |
| 19   | Keep baby drier              | 7                               | 0                                    | 0                      | 7                   |
| 20   | Provide home delivery        | 7                               | 0                                    | 0                      | 7                   |

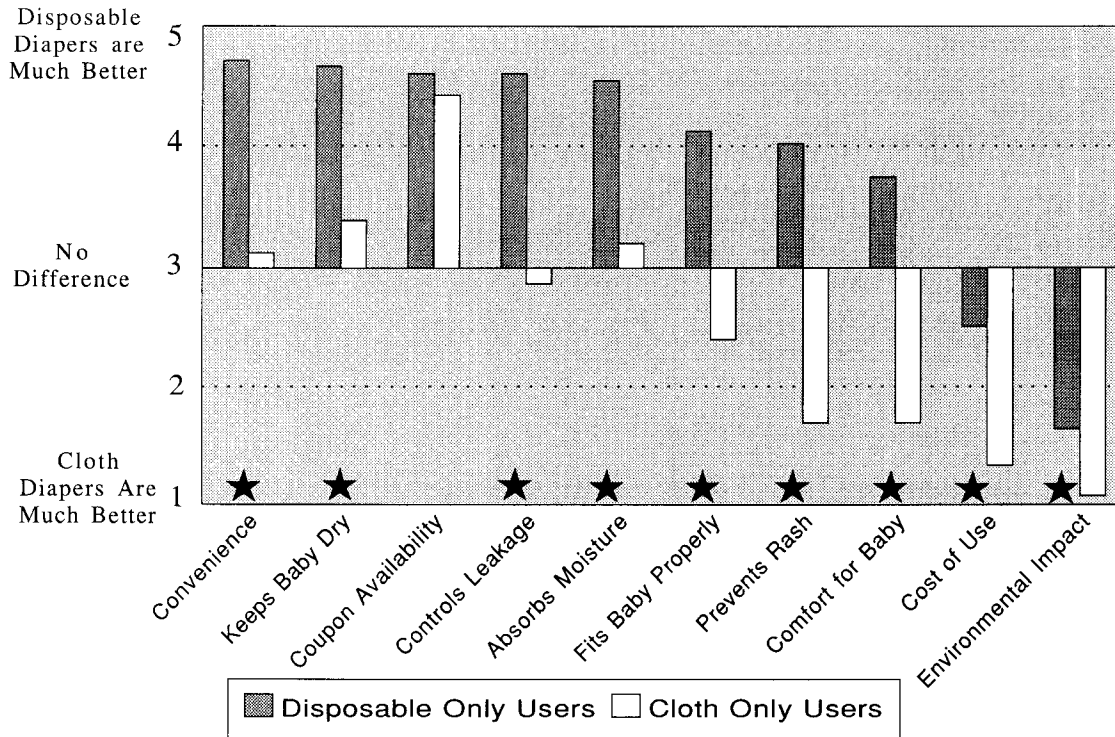
which parents were dissatisfied with each type of diaper. The first was worded as follows: "What changes would improve diapering with disposable diapers?" Of the 1,242 respondents, 950 (76.5%) provided at least one response to this question (Table 1). Overwhelmingly, it seems that U.S. parents want a more "environmentally sound" disposable diaper. Three of the four most frequent responses were to make disposables: (1) biodegradable; (2) recyclable; and (3) in some way, safer for the environment. The second most common response by parents was to lower the cost of disposables.

These responses accentuate the overall satisfaction that parents have with the performance of disposables. Relatively few parents made specific comments on performance changes they would like to see made to disposables. Seventy-two parents (7.5%) specifically stated that no improvements to diapering with disposables were needed. Perhaps more important to note, however, is the large number of parents who are dissatisfied with the

environmental performance of disposable diapers. The large difference between their satisfaction with performance and dissatisfaction with environmental impacts can be seen as a major cause of the "green gap."

Parents were also asked a similar open-ended question regarding their suggested changes to improve diapering with cloth diapers. The vast majority of the 781 parents providing a response to this question cited changes that were performance-related. Interestingly, no mention was made regarding improving potential environmental impacts despite criticism sometimes associated with cloth diapers such as water use/pollution through laundering/detergents and energy use via home delivery and laundering.

*Determinant diaper attributes.*—The respondents were also given a list of 10 decision-making factors relating to their diaper purchases. They were then asked to rate the importance of these factors to their diaper decision-making, as well as provide their perceptions of the differences between the two diapering types.



Note: ★ by each factor indicates significant difference between groups (@  $p=.05$  using ANOVA)

FIG. 2. Respondents' perceptions of cloth versus disposable diapers (by user group).

Figure 2 provides an illustration of the perceived differences between cloth and disposable diapers. From this figure it becomes obvious that there is a sharp difference in perceptions of the two diaper types, based on the type of diaper the respondents utilized. It is noteworthy that both user groups perceive cloth diapers to be better on the environmental impact factor.

By asking respondents also to rate the importance of these same factors, it is possible to develop a determinant attribute analysis for their decision-making. This type of analysis has been noted for its applicability to the wood products industry (Sinclair and Hansen 1993; Trinka et al. 1992). Determinant attribute scores are obtained by multiplying the importance and difference ratings for each of the attribute factors by respondent. It is necessary to examine these scores because of the possi-

bility that, even though an attribute may be highly important, it may not have an impact on decision-making because the consumer does not perceive any difference between two or more choices.

Table 2 provides the total determinant attribute scores for each of the 10 factors, as well as the relative ranking of the factors by user group. By examining the scores for each of the three individual user groups, we discover marked differences in which factors are most determinant for each group. For the disposable only group, the top three factors related to performance features, while environmental impact was near the bottom of their list. It is interesting to note that cost of use was ranked last for this group. Conversely, to those parents using cloth only or a combination of cloth and disposables, the cost of use factor was their second most determinant attribute. The num-

TABLE 2. Determinant attribute analysis of diaper decision-making factors (by user group).

| Decision making factor           | Disposable only<br>(n = 1,004) | Cloth and disposable<br>(n = 184) | Cloth only<br>(n = 54) | All users<br>(n = 1,242) |
|----------------------------------|--------------------------------|-----------------------------------|------------------------|--------------------------|
| Determinance scores <sup>1</sup> |                                |                                   |                        |                          |
| Ability to keep baby dry         | 20.13 (1)                      | 14.39 (3)                         | 6.10 (7)               | 18.48 (1)                |
| Ability to control leakage       | 19.32 (2)                      | 11.98 (6)                         | 4.36 (9)               | 17.34 (2)                |
| Ability to absorb moisture       | 18.87 (3)                      | 12.87 (4)                         | 5.06 (8)               | 17.25 (3)                |
| Convenience of using             | 18.08 (4)                      | 10.93 (7)                         | 3.62 (10)              | 16.10 (4)                |
| Availability of coupons          | 14.70 (5)                      | 12.13 (5)                         | 6.60 (6)               | 13.88 (5)                |
| Environmental impact             | 12.57 (8)                      | 17.56 (1)                         | 21.83 (1)              | 13.59 (6)                |
| Fitting baby properly            | 13.87 (7)                      | 5.82 (10)                         | 7.88 (5)               | 11.82 (7)                |
| Ability to prevent rash          | 14.08 (6)                      | 6.13 (9)                          | 16.36 (3)              | 11.29 (8)                |
| Comfort for baby                 | 11.38 (9)                      | 7.08 (8)                          | 15.89 (4)              | 9.04 (9)                 |
| Cost of use                      | 6.91 (10)                      | 14.89 (2)                         | 18.01 (2)              | 8.40 (10)                |

Note: Numbers in parentheses represent ranking of each attribute.

<sup>1</sup> Determinant scores are equal to the product of the 5-point importance rating (from 1 = not at all important to 5 = extremely important) on each attribute and the 5-point adjusted difference rating (between cloth and disposable diapers on a particular attribute). The original scale shown in Fig. 2 was rescaled from 1 = no difference to 5 = much difference. Therefore, the determinant score is simply:  $D = xy$  where  $x$  = attribute importance and  $y$  = attribute difference.

ber one ranked factor for these groups, however, was the environmental impact of their diapering method. These results indicate that combination users are closer to cloth only users in their determinant decision-making factors.

The outcome of this analysis illustrates how a significant number of potential users of a wood-based product limit their usage because of concerns for the environmental impact of that product. This provides an example of the opportunities a manufacturer may have to increase demand simply by educating consumers as to the truth about the environmental impact of their products. In a case such as this when the non-wood alternative has been shown to be equally harmful to the environment (Franklin Assoc. 1988), producers should promote that fact along with their product's superiority on other determinant factors that are in its favor. For many products, however, the wood or wood-based alternative will be superior to the non-wood alternatives on both environmental as well as performance factors. If customers for these products perceive environmental impact to be a determinant factor, then a competitive advantage may be gained through proactive promotion of wood's environmental friendliness.

*Parents' environmental attitudes.*—As shown in Table 3, almost 64% of responding parents agreed that biodegradable disposable diapers

were better for the environment when compared with common disposables; 78% of respondents with an opinion felt this way. Seven of ten parents with opinions on this subject similarly agreed that biodegradables will degrade much faster and are a preferred choice when compared with nonbiodegradable disposable diapers. These results imply that, to some extent, consumers tend to believe messages from manufacturers regarding the promoted improvements to their product variations.

Analysis of variance (ANOVA)<sup>3</sup> was subsequently used to compare the mean values of agreement between user groups of these attitude statements regarding disposable diapers (Table 4). By user group, disposable-only and combination users generally agreed that biodegradable diapers degrade faster, are better for the environment, and are a preferred choice. As a whole, cloth-only users slightly disagreed with these same three statements.

In response to a separate multiple choice question asking for a single response regarding biodegradable disposable diaper purchases,

<sup>3</sup> An ANOVA procedure determines if the mean values of an independent variable are significantly different from each other within each category of an independent variable.



TABLE 3. *Perceptions of environmental issues (n = 1,242).*

| Statement  | Strongly disagree | Disagree | No opinion | Agree | Strongly agree |
|--|-------------------|----------|------------|-------|----------------|
| Percentage of all respondents  |                   |          |            |       |                |
| Compared with common disposables, biodegradable disposable diapers . . . |                   |          |            |       |                |
| . . . will degrade much faster   | 5.2               | 16.3     | 25.7       | 40.2  | 12.7           |
| . . . are better for the environment                                     | 4.4               | 13.3     | 18.7       | 42.0  | 21.6           |
| . . . are a preferred choice   | 4.9               | 12.9     | 34.2       | 32.1  | 15.8           |
| Thinner disposable diapers . . .   |                   |          |            |       |                |
| . . . are environmentally acceptable                                     | 10.1              | 26.8     | 44.7       | 14.3  | 4.1            |
| . . . will keep baby as dry  | 9.3               | 17.9     | 21.1       | 40.0  | 11.8           |
| . . . will keep baby as comfortable                                      | 6.9               | 11.8     | 22.2       | 46.1  | 13.0           |

nearly 58% of parents reported having "seen biodegradable disposable diapers for sale" when shopping for disposable diapers. On the same question, 6% of responding parents "purchased only biodegradable diapers," 18% "purchased some biodegradables," and 7% report having tried and then quit using biodegradables.

In terms of thinner diapers, two-thirds of the 55% of parents expressing an opinion disagreed that thinner disposable diapers are environmentally acceptable (Table 3). The large number of respondents checking "no opinion" to this question may indicate that many parents are confused or uncertain about this issue.

By user group, the 54 parents in our sample using cloth-only diapers differed significantly

(disagreed more strongly as compared to combination or disposable-only users) in their attitudes on these statements from the other two groups. In particular, the cloth-only users disagreed most strongly with the statement that ultra-thin disposables were an environmentally acceptable alternative to diapering; disposable-only and combination users only agreed slightly. In addition, cloth-only users disagreed slightly that thinner disposable diapers will keep a baby as dry or as comfortable as thicker disposables. This evidence suggests that ultra-thin disposables are difficult to differentiate from regular disposables based on either their environmental or performance attributes, and it implies that there may be some point past which manufacturers cannot market

TABLE 4. *Perceptions of environmental issues by user group.*

| Statement  | All users<br>(n = 1,242) | Disposable only<br>(n = 1,004) | Cloth and disposable<br>(n = 184) | Cloth only<br>(n = 54) | Difference between users <sup>1</sup> |
|--|--------------------------|--------------------------------|-----------------------------------|------------------------|---------------------------------------|
| Percentage of all respondents  |                          |                                |                                   |                        |                                       |
| Compared with common disposables, biodegradable disposable diapers . . . |                          |                                |                                   |                        |                                       |
| . . . will degrade much faster   | 3.39                     | 3.46                           | 3.20                              | 2.68                   | a, b, c                               |
| . . . are better for the environment                                     | 3.63                     | 3.70                           | 3.49                              | 2.83                   | a, b, c                               |
| . . . are a preferred choice   | 3.41                     | 3.43                           | 3.50                              | 2.81                   | a, c                                  |
| Thinner disposable diapers . . .   |                          |                                |                                   |                        |                                       |
| . . . are environmentally acceptable                                     | 2.75                     | 2.81                           | 2.62                              | 2.09                   | a, b, c                               |
| . . . will keep baby as dry  | 3.27                     | 3.28                           | 3.36                              | 2.79                   | a, c                                  |
| . . . will keep baby as comfortable                                      | 3.47                     | 3.49                           | 3.51                              | 2.94                   | a, c                                  |

<sup>1</sup> Statistically significant at the .05 level using ANOVA. a = difference in means of disposable and cloth users; b = difference in means of disposable and combination users; c = difference in means of cloth and combination users; d = no difference in means of any two groups.

<sup>2</sup> Mean value of comparison using a five-point Likert scale from 1 = strongly disagree to 2 = disagree to 3 = no opinion to 4 = agree to 5 = strongly agree.

product variations that consumers will perceive to be significantly better for the environment.

*Demographics.*—In terms of demographic variables, our 237 cloth-only and combination diaper using respondents, representing 19.2% of respondents, had a slightly higher level of education and income. Nearly 22% of parents holding a college degree used cloth diapers, whereas only 12.7% of parents who had not graduated from high school reported using cloth diapers. Cloth users were also more likely to be married and/or living with their partner, and were more likely to have only one full-time income or less compared with disposable-only respondents; correspondingly, the parents who were not married or were not living with their partner relied more heavily on the use of disposable diapers. Additionally, there was virtually no difference in diaper use between the white and non-white parents in our sample.

#### DISCUSSION

We have shown that the diapering public is concerned with both health (related to performance features) and environmental issues. For the majority of parents, however, attitudes toward the environment are being overcome by the desire for convenience and product performance, which in turn drives a behavior that many believe to be environmentally harmful. This may provide a strategic opportunity for manufacturers and a potential arena for public policy makers. The large number of combination users in our survey is illustrative of consumers who are sensitive to the environmental consequences of their actions and yet value the added convenience of disposables for certain occasions and times of the day. This is an example of the need for marketers to segregate customers by both product attributes and usage situations (Srivastava et al. 1984; Dickson 1982).

#### *Implications for educators*

It should be clear from these results that the overwhelming majority of respondents perceive disposable diapers to have a much great-

er impact on the environment than do cloth diapers. These perceptions exist even though experts have shown that neither type of diaper is on the whole more environmentally friendly than the other (Lehrburger 1988; Franklin Associates 1988). Green gaps, possibly caused by similar misperceptions, may also exist for other wood and wood-based products. Consumers receive sometimes conflicting messages from various sources; non-wood substitute products producers and environmental groups often promote a bias against wood use with deleterious implications regarding its environmental impact. It is therefore critical for those from industry, trade associations, and academia to understand that consumers' perceptions are causing green gaps, and that these perceptions can be created from controversial and sometimes conflicting arguments. These findings strongly reinforce the need to educate consumers as to the environmental friendliness of many wood products. The need for such educational programs has recently been noted by leaders in forest products education (Bowyer 1993a, b), trade associations such as the Western Wood Products Association (Anon. 1993a) as well as building materials retailers (Anon. 1993b).

#### *Marketing implications*

Our research has shown that while certain segments of consumers will buy a product based on its performance, price, and convenience characteristics, there remain a substantial number who will continue to be dissatisfied until an available product also matches their ideal for a "green" product. Manufacturers, with the opportunity to shape consumers' perceptions and attitudes, must be aware of competing and possibly contradictory messages being transmitted by both competitors and outside influence groups. This situation may also provide an opportunity for firms to gain a competitive advantage by working with outside influencers, such as policymakers and environmental groups, to change consumers' perceptions of their products.

The findings from this research should be heeded by product marketers who manage

products that consumers may perceive to be detrimental to the environment. This study suggests that the environmental trade-offs with convenience, performance, and price are important for many parents who may be willing to switch to an alternative that provides a better perceived compromise. The promotion of products and their variations as being environmentally friendly or less harmful to the environment should provide for a competitive advantage. At some point, however, firms may encounter diminishing returns if the credibility of their message, through experience or by conflicting messages from outside groups, becomes questionable.

#### CONCLUSIONS

Given the dominance of disposable diaper usage, along with parents' negative perceptions of the environmental friendliness of disposable diapers, we can only conclude that the "green gap" appears to be sizable in terms of baby diapering product alternatives. Neither cloth nor disposable user groups are completely satisfied with the current product offerings; both would like to see a more "environmentally sound" disposable diaper with high levels of performance and convenience. The vast majority of responses to our open-ended question asking for changes that would improve diapering with disposables were to make them biodegradable, recyclable, or in some way "safer" for the environment.

Just as consumers' green wants have led to decreased volumes of fluff pulp used in disposable diapers, so, too, can these wants affect the demand for other wood products. Manufacturers such as those producing disposable diapers are changing their products in an attempt to satisfy consumers' green wants. Similarly, retailers such as Wal-Mart and Home Depot are increasingly demanding environmentally friendly products in hopes of satisfying consumers. Both of these trends have the potential to impact the demand for wood products negatively unless action is taken to educate the consuming public. A primary thrust of such educational efforts must be aimed at

factual, believable information that will help to convince consumers that wood products can best satisfy their green wants.

Recently, the emergence of environmental consequences associated with product use has had an impact on the diapering decision. Today, an environmental trade-off is being presented to consumers, but the various messages are often contradictory and less than fully credible. "Green" promotional literature expounding the environmental benefits of various diaper product alternatives has complicated a purchase decision previously dominated by price-performance-convenience factors. Practitioners, educators, and other influential organizations are recognizing the need to consider the environmental consequences of product manufacturing, use, and disposal. This issue represents both a threat and an opportunity for wood products marketers and will undoubtedly receive increased attention in the future.

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