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The Effects of Trivial Attributes on Choice of Food Products

Dragan Miljkovic, Jian Gong, and Linda Lehrke

Trivial or irrelevant attributes are defined as attributes that do not create a meaningful difference in a brand's performance. The objective of this paper is to determine if and how trivial attributes affect consumers in their choice of variety/brands of food products including frozen green beans, orange juice, canola oil, and frosted strawberry toaster pastries. Sixty subjects participated in the experiment. Subjects understood that trivial attributes are less important than substantive attributes. Substantive (important) quality attributes and economic variables affecting choice were all perceived equal across brands by the subjects in the experiment. Two critical driving forces in determining the presence and direction of the effect of a trivial attribute on the consumer choice are the size of the choice set and the type of trivial attribute, i.e., product versus promotional attribute.

Key Words: consumer choice, food products, product attributes, promotional attributes, choice set size, trivial attributes

Substantive quality attributes of different brands of a product are strongly correlated to most standards of performance (Carpenter, Glazer, and Nakamoto 1994). However, they are not the only determinant of choice once economic attributes such as price are assumed equal or set aside. Trivial or irrelevant attributes, on the other hand, are not strongly correlated to any standard of performance (Goldstein and Busemeyer 1992). Although they do not create a meaningful difference in a brand's performance, they often show an effect on choice (e.g., Goldstein and Busemeyer 1992, Simonson, Nowlis, and Simonson 1993, Simonson, Carmon, and O'Curry 1994, Carpenter, Glazer, and Nakamoto 1994, Meyvis and Janiszewski 2002, Broniarczyk and Gershoff 2003, van Osselaer, Alba, and Manchanda 2004, Winchester, Romaniuk, and Bogomolova 2005, Loken 2006, Cunha, Janiszewski, and Laran 2008). The effects of trivial attributes on choice, however, have been both positive (choosing the brand with trivial attributes over brands without it) and negative (choosing brands without trivial attributes over brands with it) and therefore are inconsistent. The key finding in the above studies is that while consumers acknowledge that the differentiating trivial attribute is unimportant to the experienced value of the product, they still persist in valuing the brand differentiated by a trivial attribute. In other words, the trivial attribute is/becomes important because it helps make the brand different from other brands, i.e., it becomes a mark of differentiation.

There are several explanations of this apparent paradox, i.e., the importance of trivial attributes impacting choice. A non-exhaustive list of explanations follows. Tetlock and Boettger (1989) think that trivial attributes dilute the effect of important attributes through an averaging process. Similarly, Hutchison and Alba (1991) suggest that this phenomenon is due to the salience effect, or trivial attributes drawing attention away from the important or substantive attributes. Carpenter, Glazer, and Nakamoto (1994) think that trivial attributes affect choice through their uniqueness in the choice set or by encouraging consumers to draw positive or negative inferences about a product's other attributes or about a marketer's pragmatic intentions.

The common thread in all these studies is that they try to explain why consumers may react to a trivial attribute. However, they do not explain why this effect is positive in some cases but nega-

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tive in others. The only line of research trying to resolve that empirical conflict is the reason-based account for the valuation of trivial attributes (Bastardi and Shafir 1998, Fischer et al. 1999, Brown and Carpenter 2000). According to this theory, consumers prefer to choose on the basis of easily justified, cognitively available reasons. Under ideal circumstances, the reasons are based on important or substantive attributes for which one brand is clearly superior [the "lexicographic semiorder" introduced by Tversky, Sattah, and Slovic (1988)]. However, if no reason for choice on the basis of more important attributes can be constructed, consumers will rely on reasons based on trivial attributes (Fischer et al. 1999). This process is called an "instrumental reasoning process," which indicates that consumers make such valuations because they are instrumental in achieving task goals.

The most important and distinguishing characteristic of trivial attributes relative to substantive attributes that are clearly important, is that they are not strongly correlated to any standard of performance. One can say that under normal or ordinary circumstances trivial attributes do not provide a good reason for a product to be chosen. That is why manufacturers or marketers are generally willing to add substantive or important attributes to their products, as a result of which their product is clearly superior to its competition. The problem is that it is not always easy; sometimes it is too expensive, and often not possible at all, at any cost, to add a clearly superior substantive attribute to a product. When that is the case, a producer can add an unrelated premium, add a unique ingredient, or create a novel association with the brand in order to differentiate it from competition, even though that newly created attribute does not improve the performance of the product. In other words, it is a trivial attribute.

One of the classic examples in marketing literature of trivial attributes is when silk is added to shampoo (e.g., Brown and Carpenter 2000, Carpenter, Glazer, and Nakamoto 1994). Its addition does not affect a shampoo's color, cleaning effectiveness, or texture. Thus, it is a trivial attribute. Most consumers facing a choice between similar shampoos may decide to check first for price, evidence of conditioning, or evidence of effectiveness. These all seem to be substantive attributes. If one brand is clearly superior on one or more of these attributes, the consumer's choice is likely not too dependent on the presence of silk. However, if a consumer cannot find significant or undisputable differences in these attributes among brands, he may consider the trivial attribute in order to help his choice, thus conferring subjective value on the product. The logic behind adding silk to the shampoo might be silk's association with luxury. Thus, a consumer may feel, due to this association with luxury, as though he is treating himself with the purchase. This could be the case even if the consumer knows that no objective value exists.

One final distinction among different trivial attributes is to be made here. Trivial attributes may be product-related (as in Carpenter, Glazer, and Nakamoto 1994) or promotional (as in Simonson, Carmon, and O'Curry 1994). An example of a food product related trivial attribute would be "French-cut" green beans, while an example of a promotional trivial attribute would be a "free T-shirt iron-on" coming with frosted strawberry toaster pastries. In both cases, these trivial attributes do not reveal any useful information about the products themselves.[1]

The objective of this article is to determine if and how the trivial attributes affect consumers in their choice of variety/brands of food products. None of the previous studies, to the best of our knowledge, dealt with food products.[2] Due to the nature of food products being necessities, their economic attributes such as low price and income elasticities are unlikely to cause substituting one brand for another of the same food product (Hudson 2006, Tomek and Robinson 2003). However, food products possess some substantive or important nutrition attributes that may have direct short- and long-term effects on human health. The implications of the results in this study are pertinent to the issue of the effect of the presence/absence of trivial attributes alongside the substantive nutrition attributes on consumer choice. The size of

[1] One may consider how the promotional attributes of the products in this or in similar studies work as "added values" to the consumer, thereby blurring the line between a trivial attribute and a substantive attribute such as the monetary value. Please note that economic attributes such as price are assumed equal or set aside. In most products the monetary value of promotional items is truly negligible or assumed to be negligible relative to the value of the product of interest.

[2] One exception may be a study by Brown and Carpenter (2000) in which they considered, among other products, coffee. We do not consider coffee a food product since it is not a necessity and does not provide any nutritional value according to the USDA's food guide pyramid.

the brand choice set (small choice set or two-brand set versus larger choice set consisting of at least three brands) and type of trivial attribute (promotional versus product attribute) are varied to determine the positive or negative reason effect on brand choice when a trivial attribute is present. For instance, we hypothesize, based on results of previous studies, that if only one brand possesses a trivial attribute in ambiguous choice sets of three brands or more, a positive reason is most effective in establishing a single preferred brand. On the other hand, in two-brand sets, either a positive or a negative reason is effective. The logic in both settings is the same: people reason in such a way as to allow a single brand to appear superior to the rest. Hence, it is easier to define preference and predict choice in a larger set of three or more brands, than in a small set of two brands, when a trivial attribute is present.[3] Controlled experiments are conducted to empirically test the above hypotheses.

Stimulus design, subjects, and experimental procedures are defined in the next section, followed by results, and then implications and conclusions.

Methodology

Stimulus Design, Subjects, and Experimental Procedures

It has been shown that consumers highly value health- and nutrition-related information about food products, and often use such information to differentiate among different brands of food products (Nayga 2000, Kim, Nayga, and Capps 2001). We selected in a supermarket actual sets of brands for four different food products: frozen green beans, orange juice (not from concentrate), canola oil, and frosted strawberry toaster pastries. These products were chosen since they play very different roles in people's nutrition and everyday lives. Orange juice contains high levels of vitamin C. Canola oil is considered to be one of the healthiest commonly used cooking oils due to the low content of saturated fat, the high content of monounsaturated oil, and the presence of beneficial omega-3 fatty acids (Zeratsky 2007). Thus, these two products are often promoted as healthful foods. While green beans are a low calorie food and are also a source of many nutrients such as iron, dietary fiber, vitamin A, vitamin K, and vitamin C, frozen green beans are also very convenient since they can be stored frozen for a long time without losing many of their nutritional properties. Finally, frosted strawberry toaster pastries represent a convenient, easy-to-make snack food but with few desirable health and nutritional attributes. No true names of brands were used in order to avoid the potential effect that producer or brand name and reputation may have on consumer choice. Again, the objective here is to measure the impact of trivial attributes on consumer choice, *ceteris paribus*.

In the case of green beans, brands differed along four attributes: calories per serving, content of iron, fiber per serving, and whether green beans are French-cut or not (trivial attribute).[4] In the case of not-from-concentrate orange juice, brands also differed along four attributes: content of sugar, content of vitamin C, number of carbohydrates, and (the trivial attribute) whether the juice is from 100 percent Florida natural oranges. Florida oranges are sweeter and juicier than California oranges and, because of that, 80 percent of them are used for juice.[5] More than 80 percent of California oranges are eaten and not used for juice. Most orange juice producers in the United States use either only Florida oranges or (e.g., Minute Maid) mostly Florida oranges combined with some Brazilian or Costa Rican oranges that are deemed to be similar to Florida's oranges. Subjects in the study were informed that it is likely that all brands of orange juice may have been made from Florida oranges even if not all manufacturers promoted that. In the case of canola oil sold in one-gallon jugs, brands are differentiated on four dimensions: calories, content of

[3] Larger sets of three or more brands of various food products are also more likely to be encountered by consumers in supermarkets or other types of food stores.

[4] French-cut beans are cut in half lengthwise, running the knife down the flat part between the seams of the bean. Regular-cut and whole beans are other standard ways of packaging green beans. The authors "brainstormed" among themselves about whether type of cut is really a product-related trivial attribute. None of them actually knew what "French-cut" means. The authors also determined, based on casual inspection of several cookbooks, how very few recipes call for French-cut beans specifically. Moreover, subjects in the study were asked specifically if they knew what "French-cut" green beans means, and only five out of sixty said they did. However, they were unanimous in stating that type of cut really does not matter to them. Thus the authors reached a consensus that type of cut makes no difference in consuming green beans.

[5] See http://www.minutemaid.com/about/AllAboutOJ.jsp.

fat, amount of sodium, and (the trivial attribute) an offer of a free, small, heart-health cookbook. In the case of frosted strawberry toaster pastries, brands are differentiated based on three substantive properties—content of sugar, amount of fat per serving, and calories per serving—while the trivial attribute was an offer of a free T-shirt iron-on. As one can see from the above, trivial attributes in the case of the first two products (green beans and orange juice) are product-related, while trivial attributes in the case of canola oil and frosted strawberry toaster pastries are promotional.[6]

Based on the above attributes, we constructed choice sets of either two or three brands. Attribute levels for all categories are given in Table 1. Importantly, each brand in these sets was only slightly superior on one of the three important or substantive attributes. For example, in the green beans category, brand C has fewer calories per serving than brand A or brand B; brand B contains a higher percentage of iron per serving than the other brands; and, brand A contains more fiber per serving than either brand B or brand C. This implies that it is likely that subjects in the experiments will search for additional reasons for choosing one brand over another. The last item in each choice set was the target brand, i.e., the brand differentiated by the trivial attribute, so that we could test our theory by demonstrating the effect of adding the trivial attribute to the target brand versus its undifferentiated equivalent.

The study had a $4 \times 2 \times 2$ repeated measures design. Product category was a within-subjects repeated factor, while set size (2 versus 3 brands) and trivial attributes (present versus absent) served as between-subject factors. Subjects of the experiments were 60 undergraduates (juniors and seniors) majoring in business or agribusiness, and graduate (MBA) students at two large Midwestern and East Coast universities. It was determined that all subjects had either part-time or full-time jobs and were the primary food buyers in their households. An equal number (30) of female and male students participated in the experiment. Finally, while there was no specific analysis or profiling of the subjects' gender, race, or ethnicity, casual observation suggested that this group was rather representative of the overall population in these two regions, with a majority of the subjects being white, and a large minority of the subjects being African American, Asian, Indian, or Hispanic.

Subjects were not rewarded for their participation because it was suggested in several influential studies that used and did not use rewards (e.g., Tversky and Kahneman 1981, Tversky 1969) that no significant difference in responses was determined between the two groups. However, the issue of impact of financial incentives on human behavior is a point of sharp theoretical divide between economics and all other social and behavioral sciences. This difference is nicely summarized in Camerer and Hogarth (1999, p. 7): "The difference is manifested in alternative conventions for running experiments. Economists presume that experimental subjects do not work for free and work harder, more persistently, and more effectively, if they earn more money for better performance. Psychologists believe that intrinsic motivation is usually high enough to produce steady effort even in the absence of financial rewards; and while more money might induce more effort, the effort does not always improve performance." In their review of 74 experimental papers, Camerer and Hogarth (1999, p. 34) found the following: "The data show that incentives sometimes improve performance, but often don't. This unsurprising conclusion implies that we should immediately push beyond debating the caricatured positions that incentives always help or never help. Adopting either position, or pretending that others do, is empirically misguided and scientifically counterproductive." However, even among economists it has been argued that incentives either worsen (e.g., Friedman 1998, Grether and Plott 1979) or do not affect (e.g., List and Shogren 1998, Binswanger 1980) the performance of experiment subjects. Studies that served as the basis for this study (Brown and Carpenter 2000, Carpenter, Glazer, and Nakamoto 1994, Simonson, Carmon, and O'Curry 1994) determined in their preliminary studies that financial incentive does not matter and thus have not provided salient rewards to their experiment subjects

[6] One could argue that promotional bundling of two products in a market of nearly homogeneous goods leads consumers to evaluate the promotional trivial attribute (T-shirt iron-on or heart-health cookbook in our examples) rather than the product in question. And that is true: sellers have promotions in order to increase the sales of their products, and often promotions (including the above promotional attributes) have nothing to do with the quality or performance of the product they are trying to sell.

Table 1. Attribute Levels for All Products

	Brand A	Brand B [a]	Brand C (Target)
GREEN BEANS			
Calories (per serving)	80 cal	80 cal	60 cal
Iron (% daily value per serving)	2%	5%	2%
Fiber (grams per serving)	5g	2g	2g
French-cut [b]	No	No	Yes
CANOLA OIL GALLON			
Calories (per serving)	120 cal	120 cal	100 cal
Fat (grams per serving)	14g	11g	14g
Sodium (per serving)	0 mg	2 mg	2 mg
Free heart-health cookbook [b]	No	No	Yes
ORANGE JUICE			
Sugar (grams per serving)	27g	27g	22g
Vitamin C (% daily value per serving)	60%	40%	40%
Carbohydrates (grams per serving)	27g	22g	27g
100% Florida natural oranges [b]	No	No	Yes
FROSTED STRAWBERRY TOASTER PASTRIES			
Sugar (grams per serving)	40g	40g	35g
Calories (per serving)	200 cal	180 cal	200 cal
Fat (grams per serving)	4g	5g	5g
Free T-shirt iron-on [b]	No	No	Yes

[a] This brand was eliminated in the two-brand scenario.
[b] The trivial attribute was omitted in the "trivial attribute absent" scenario.

either.[7] Hence we decided to not use salient rewards, given that previous studies on the same or related issues have established little or no effect of salient rewards on the experiment subjects. Finally, all 60 subjects participated in all experiments described below.[8]

All experiments were conducted by the authors of this paper. Although real brands sold in supermarkets were used in the experiments, the names of the brands were not revealed to the subjects since that could have affected their choice if they had a preconceived notion about some brands due to personal experience or advertising impact. However, since only health and nutrition were considered substantive attributes, the subjects were told that all organoleptic attributes such as flavor, taste, or color were considered equal among brands. Subjects were then told that they would be rating characteristics of these four food products. Each food product was described, and in the case of product-related trivial attributes, attribute descriptions were provided. For instance, subjects were told that French-cut green beans or the origin of oranges (100 percent Florida natural oranges) does not make a difference concerning a brand's performance.[9] The promo-

[7] Brown and Carpenter (2000) did provide a $5 show-up or participation incentive, but $5 is not considered salient enough to impact or change the performance of the subjects.

[8] One caveat is called for here. This study and most other studies referenced here used students in the experiments they conducted. While students are legitimate subjects for use in experimental research, they are not fully representative of the greater society given their life-cycle stage and experience. In order to generalize the results of this and similar studies, it would be beneficial to enlarge the scope of the subjects used in experiments beyond the student population and to consider a fully representative sample of the general population.

[9] The authors felt that it was critically important to make sure the subjects clearly understood the difference between substantial and trivial attributes before making their choice.

tional trivial attributes were assumed to be, following Simonson, Carmon, and O'Curry (1994), obviously irrelevant to brand performance.

Next, experiment subjects were exposed to the choice set size manipulation, i.e., they were presented the target brand plus either one or two competing brands per food product. In other words, one of the competing brands was dropped in the two-brand scenario, and the subjects could see only a single competing brand along with the target brand. For instance, if one is to look at Table 1, when brand B is dropped, the remaining brands A and C (target brand) are identical to those presented in the three-brand scenario. The target was always presented last, to control the order of presentation. Therefore, the relevant test for the effects of trivial attributes on choice will be the choice probability for the trivial attribute target brand versus the non-trivial attribute version of the same brand presented in the same order against the same competitors.

The following variables were measured. First, subjects were asked to indicate their choice among the brands. Second, they were asked to rate the importance level of attributes, their level of interest, and experience in the product category. Finally, they were asked to rate their level of confidence that the highest level of each attribute presented in the choice set was significantly superior or inferior to the lowest level. This was done as a manipulation check to confirm (or not) whether there was ambiguity about each brand's superiority on substantive attributes. The procedure was repeated four times, once for each different food product.

Statistical Analyses

Next, we tested what effect the presence of trivial attributes might have on brand preference in multiple- (three) brand choice sets. Choice of target brand was the dependent variable, and presence of the trivial attribute served as the explanatory variable. We performed a logistic regression with robust standard errors [Huber-White estimator (Greene 2003, Huber 1967)], where the assumption of independence among multiple observations from the same subject is relaxed, and a distribution for the difference between error terms is assumed. Assuming that the errors are random independent variables following a Weibull distribution, the distribution of the difference between these errors is logistic (Domencich and McFadden 1975). Since consumers choose among three alternative brand categories of a food product, the estimated equation reduces to a multinomial logit (MNL) where the probability of choosing brand A, B, or C is a function of various brand attributes.[10] The discrete MNL model can be used for a range of specifications, ranging from merely coding data for some qualitative outcome or for convenience to ranking data and specifying consumer choice among alternatives (Greene 2003).

The choice of a target brand (base preference) is made outside of the framework of the model, so the probability of factors that result in choosing target brand is indeterminate. This indeterminacy problem can be overcome by normalizing the coefficients for the target brand to zero (Amemiya and Nold 1975). Once this is done, the probability of the ith brand (category) for the jth consumer is

$$\Pr_{ij} = \frac{e^{X_j\theta_i}}{\sum_i e^{X_j\theta_i}} \quad . \tag{1}$$

Estimation of the MNL econometric model was accomplished with the use of Nlogit (version 3.0). A choice-based sampling technique, readily available in Nlogit, was applied to estimate a robust covariance matrix for the MNL model (Greene 2003, pp. 720–723). With choice-based sampling, the coefficients are not affected but the estimation errors are minimized.

Results

Manipulation checks confirmed two important assumptions we made in the analysis. These results are reported in the box on the following page. First, the null hypothesis that trivial and substan-

[10] An alternative specification that can be used is the multinomial probit model. However, Greene (2003, p. 728) pointed out that it is unclear how the coefficient of the ordered model should be interpreted, or in what direction the effects should be exerted: "Identification appears to be a serious problem with the MNP model. Although the unrestricted MNP model is fully identified in principle, convergence to satisfactory results in application with more than three choices appears to require many additional restrictions on the standard deviation and correlations, such as zero restrictions or equality restrictions in the case of the standard deviations." And while we do not deal with more than three choices in this particular case, using the MNP would certainly prevent us from being able to test the hypothesis in more complex (and realistic) cases of four or more choices.

Manipulation Checks

H_0: Trivial and substantive attributes are equally important [a]
H_A: Trivial and substantive attributes are not equally important
$\bar{X}$ (substantive attributes) = 6.52
$\bar{X}$ (trivial attributes) = 4.41
$t(59) = 6.11$ [b]

H_0: Confidence about superiority of one attribute's level over another ≤ 5 [c]
$\bar{X} = 3.52$
$t(59) = -1.34$

[a] The importance levels of attributes are ranked from 1 through 10, with 1 being the lowest and 10 being the highest importance level.
[b] Significant at the 0.01 level.
[c] The confidence about superiority of one attribute level over another is ranked 1 through 10, with 1 being the lowest confidence level and 10 being the highest confidence level. Five is the arbitrarily chosen average confidence level (subject is not sure about superiority of one attribute over another).

tive attributes are equally important was tested. The importance level of attributes was ranked from 1 through 10, with 1 being the lowest and 10 the highest importance level. The mean values of importance level for substantive and trivial attributes were 6.52 and 4.41, respectively. Statistical testing revealed that the null hypothesis had to be rejected, i.e., subjects viewed the trivial attributes as less important than the substantive attributes. Second, the null hypothesis about the superiority of one attribute's level (e.g., amount of iron per serving in green beans) over another (e.g., amount of fiber per serving in green beans) was tested. Subjects were not confident about the superiority of one attribute level over another.

Following Carpenter, Glazer, and Nakamoto (1994), the analysis was first limited to choice sets containing only product-related trivial attributes (orange juice and green beans). Results indicate that the trivial attribute had a positive effect on choice in the three-brand case: with the trivial attribute absent, only 20 percent of subjects chose the target brand; while with the trivial attribute present, 40 percent of subjects chose the target brand. In statistical terms, the z test statistic was $z = 2.32$, with the p value being $p \leq 0.02$. The same experiment and analysis were repeated for two-brand choice sets containing only product-related trivial attributes. When the trivial attribute was absent, 50 percent of subjects chose the target brand (brand C). On the other hand, when the trivial attribute was present, only 40 percent of subjects chose the target brand. This effect was not statistically significant, as the z test statistic was $z = -1.01$, with the p value being $p \leq 0.32$.

Following Simonson, Carmon, and O'Curry (1994), we performed the same experiment and analysis for both two- and three-brand choice sets but with these sets now containing only promotional trivial attributes. In the two-brand choice set case, 38.3 percent of the subjects chose the target brand when the trivial attribute was absent, while 25 percent of the subjects chose the target brand when the trivial attribute was present. In the three-brand choice set case, 30 percent of the subjects chose the target brand when the trivial attribute was absent, while only 21.7 percent of the subjects chose the target brand when the trivial attribute was present. In neither case were the results statistically significant, with $z = -1.10$ and $z = -0.85$ and p values being $p \leq 0.28$ and $p \leq 0.40$, respectively. The results on the patterns of impact on choice of trivial attributes are shown in Table 2.

Next, we considered whether different types of trivial attributes may be able to explain the difference in results. MNL regression is performed again, including all four food products, with choice serving as the dependent variable. Type of trivial attribute (product-related or promotional) and set size served as between-subjects factors, while order of presentation served as a within-subjects factor. Results indicate that brands with promotional attributes that are unrelated to the food product (as for the canola oil or frosted strawberry toaster pastries) are less likely to be chosen (23.3 percent) than the brands with product-related trivial attributes (40 percent), or in statistical terms $z = -2.58$ or $p \leq 0.02$. We also considered four individual food products separately. Of the four products, green beans show strong support for our hypothesis that the same trivial attribute can have both a negative and positive impact on choice ($p \leq 0.04$). Proportions of the chosen canola oil with and without trivial attributes are also consistent with this premise, but

Table 2. Results Reported: Overall, by Type of Trivial Attribute, and by Product

	Two-Brand Choice Sets (%)			Three-Brand Choice Sets (%)	
	Trivial Attribute Absent	Trivial Attribute Present		Trivial Attribute Absent	Trivial Attribute Present
Overall [a]	44.2	32.5		25.0	30.9
p-value [b]	(0.30)			(0.50)	
Product-related trivial attributes	50.0	40.0		20.0	40.0
p-value	(0.32)			(0.02)	
Green beans	60.0	35.0	*p*-value (0.04)	28.3	40.0
Orange juice	40.0	45.0	*p*-value (0.63)	11.7	40.0
Promotional trivial attributes	38.3	25.0		30.0	21.7
p-value	(0.28)			(0.40)	
Canola oil	41.7	31.7	*p*-value (0.10)	25.0	35.0
Frosted strawberry toaster pastries	35.0	18.3	*p*-value (0.76)	35.0	8.3
Brand with product-related trivial attribute chosen (combined with two- and three-brand choice set)				40.0%	
Brand with promotional attribute chosen				23.3%	
p-value				(0.02)	

[a] "Overall" refers to all choices of brand C across all four product categories.
[b] *p*-value is for the test of equality of proportions of all choices of brand C in the presence and absence of a trivial attribute.

are only at the 10 percent significance level. Interestingly, proportions for orange juice and frosted strawberry toaster pastries, albeit statistically insignificant, show a different pattern of results. Also, none of the overall interactions of trivial attribute type or food product with experimental conditions are found to be statistically significant. Therefore, all further analysis is collapsed across types of trivial attributes. These results are also included in Table 2.

Overall results were next analyzed using the same procedure, i.e., the MNL regression with robust standard errors on data from all four food product categories, with choice as the dependent variable, presence of trivial attributes and set size as between-subject factors, and order of presentation as a within-subject factor. Before the MNL analysis was done, additional tests to ensure that the categories are significantly distinct were necessary. The non-parametric Mann-Whitney test (also known as the Mann-Whitney *U*-test when *U* is calculated) was used to ensure that aggregated data fell into distinct categories. This test is used instead of the parametric *t*-test because of deviations from normality. Seven test measures were performed for the seven multinomial categories (green beans versus orange juice, green beans versus canola oil, green beans versus frosted strawberry pastries, orange juice versus canola oil, orange juice versus frosted strawberry pastries, and canola oil versus frosted strawberry pastries), with the data assembled into a single set of size $N = n_a + n_b$ for each pair. The Mann Whitney test used here is based on the z test, which is defined as

$$z = \frac{\left(T_{obs} - \mu_T\right) \pm 0.5}{\sigma_T},$$

where T is the observed value for either T_A or T_B, A and B are the two multinomial categories being tested in each pair, μ_T is the mean of the corresponding sampling distribution of T, σ_T is the standard deviation of that sampling distribution, and 0.5 is used as a correction for continuity (with -0.5 used when $T_{\text{obs}} > \mu_T$ and +0.5 used when $T_{\text{obs}} < \mu_T$). With a calculated symmetric z-value of 131.93 and a p-value of 0.001, we conclude that data for green beans and orange juice

can be grouped into separate discrete categories without significant loss of information. Similar results were obtained for all seven comparisons.

Results of the MNL analysis indicate that there were no statistically significant effects of presence of the trivial attributes on choice given $z = 0.55$ or $p = 0.42$. Therefore, the uniqueness of the brand possessing the trivial attribute does not itself account for choice results. Our prediction that there is significant interaction between trivial attributes and set size is confirmed, i.e., $z = 1.67$ or $p \leq 0.10$. However, subjects in the two-brand and three-brand experiments showed different patterns of behavior, but in both cases the effect of trivial attributes on brand choice was not statistically significant. Neither anticipated positive effects of trivial attributes on brand choice in the three-brand setting (30.9 percent with trivial attributes versus 25 percent without trivial attributes) nor anticipated negative effects of trivial attributes on brand choice in the two-brand setting (32.5 percent with trivial attributes versus 44.2 percent without trivial attributes) reached the statistical significance level of $\alpha = 0.10$, with p-values being $p \geq 0.50$ in the three-brand setting and $p \geq 0.30$ in the two-brand setting (see Table 2).

Implications and Conclusions

Common sense tells us that consumers are not motivated to think systematically about trivial attributes. However, previous research and this study show that trivial attributes may play an instrumental role in consumer choice when consumers are not able to differentiate and choose a product brand based on differences in substantive (important) quality attributes or economic variables such as price. Then they choose based on available information that helps them to differentiate among various brands, i.e., they choose based on the presence or absence of trivial attributes. Carpenter, Glazer, and Nakamoto (1994), Simonson, Carmon, and O'Curry (1994), and Brown and Carpenter (2000) demonstrated that trivial attributes may have either a positive or negative effect on the choice of a consumer considering different product categories (e.g., clothing, cosmetics, and audio equipment). We confirmed their findings considering a variety of food products. One caveat to this study and all previous studies dealing with trivial attributes is that the introduction of salient rewards to experiment subjects may have led, albeit unlikely, to different outcomes.

First, we determined, based on manipulation checks, that experiment subjects understood that trivial attributes were the least important attributes and that substantive attributes were all equally important to them. We then showed that two critical driving forces in determining the presence and direction of the effect of trivial attributes on the consumer's choice are the choice set size and the type of trivial attribute, i.e., product versus promotional attribute. Although statistical results confirmed that the choice set size matters, we could not conclude, based on results of statistical tests, that subjects choosing from three-brand choice sets were more likely to choose the target brand with the trivial attribute than the one without it, while subjects choosing from two-brand choice sets were more likely to choose the target brand without the trivial attribute. This result may be interpreted as follows. Having to choose between two brands only makes it clear to consumers that trivial attributes do not add any value to the product they are buying, and they may feel that a trivial attribute is nothing more than a hoax. Yet when complexity of the choice set increases, consumers learn quickly that differences in substantive attributes among different brands are almost non-existent. Trivial attributes now help them separate one brand from the rest of the pack. Of course, trivial attributes must induce some positive emotion in consumers to move them beyond both indifference and/or confusion.

Our results are more powerful when considering the effect of the type of trivial attributes on consumer choice. The strongest positive results are for product-related attributes (e.g., 100 percent Florida natural oranges or French-cut green beans). This result has potentially interesting implications for both policymakers and marketers. Both of these foods can be characterized as healthful foods. Yet positive reinforcement introduced by adding a trivial product-related attribute seems to induce consumers to choose that particular brand. It seems likely that even generic government-funded and -conducted promotions, such as those for milk, are likely to increase the overall consumption of such a food. Clearly, when it comes to competition among brands, our

results indicate that adding a product-related trivial attribute to the existing substantive health and nutrition attributes may increase sales of the brand. The strongest negative results are for promotional attributes (e.g., free T-shirt iron-on with frosted strawberry toaster pastries). We think how this result is, potentially, especially interesting to marketers. Frosted strawberry toaster pastries are a snack food with little health or nutritional value. Hence, one would think that the presence of unrelated promotional trivial attributes would divert consumers' attention away from the negative impact that substantive health attributes may be having and would rather be more likely to induce or boost its choice by consumers. Yet our results suggest that promotional trivial attributes in this case were perceived by consumers as an attempt to promote a "lemon," or a brand of low or ambiguous quality (Akerlof 1970).

There are several interesting implications of these findings on sales of food products. Producers must be aware that, in an era of standardization where many food products have the same or similar quality characteristics and prices, it may pay to differentiate their products based on the presence (or absence) of trivial attributes. However, the mere presence of trivial attributes may not always help sales. Producers therefore must be aware of the number of competing brands and types of trivial attributes (product or promotional) before selecting an appropriate trivial attribute as a tool in trying to increase the sales of their brand of a certain product.

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