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Should Ads Be Consistent over Time or Change with the Market? Evidence for Young and Established Brands of Minivans

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Report summary

Brand managers are advised to maintain a consistent brand position over time. At the same time, they need to adapt their brand position to reflect changing consumer preferences. How can these conflicting demands be reconciled in dynamic markets? Does the most effective strategy differ for young versus established brands?

Koen Pauwels, Bharat Sud, Robert Fisher, and Kersi Antia investigate these questions in an analysis of the U.S. minivan market from the growth of the category to maturity. Their research is the first to shed light on the inherent trade-offs between building brands, which is achieved by reinforcing the same advertising messages over time, and keeping a brand relevant, achieved by updating advertising messages to respond to market changes.

The researchers analyze data on the U.S. minivan market from four sources (*Ward's Automotive Yearbook*, *Consumer Reports*, *Competitive Media Reporting*, and *Adweek Performance Index*) over 14 years. They operationalize “temporal consistency,” the extent to which a brand’s advertising messages remain consistent over time, and “market consistency,” the degree to which a brand’s advertising focuses on the aspects of quality that matter most to the market.

They find that both temporal and market consistency lift sales, but with diminishing effects as the brand ages. Further, for mature brands, temporal consistency offers no benefits when market consistency is high.

These findings offer useful insight to managers responsible for building new brands and maintaining the relevance of mature brands.

When brands are young they should identify the attributes that are most valued by the target market and incorporate them in advertising messages that are used consistently over a long period of time. As they mature, brands can compensate for a lack of market consistency by maintaining high levels of temporal consistency.

A key insight for mature brands is that when they update their advertising messages to reflect changing market preferences, temporal consistency will not benefit sales.

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“Instead [of managing the brand image over time], short-term, market-driven factors such as current consumer needs and competitors are used as a basis for managing the brand’s image/position.” Park et al. 1986, p. 135.

“Brands are like muscles: Exercise them, stretch them, and keep them moving and they’ll have a longer, healthier life. Let them be couch potatoes and they’ll atrophy.” Zyman 2002, p. 61.

The above quotes emphasize an as yet unresolved schism in contemporary brand management – should brands retain the same advertising message over time, or should they update it to reflect changing consumer preferences? This question highlights the tension between developing and maintaining *strong* versus *relevant* brand associations (Keller 1993). Consistent messaging helps establish strong brand associations through reinforcement and familiarity effects, but what if they become irrelevant to target customers?

When consumer preferences are stable, the prescription for success is straightforward – identify the most important benefit and consistently focus your advertising on this benefit as long as possible. However, managers must reconcile two diametrically opposed strategies when consumer preferences are changing. The first, which we term the *temporal consistency* (TC) view, appears in most brand management textbooks and attributes the success of well-known brands such as Marlboro, Maytag, and McDonald’s to maintaining a consistent position over a long period of time (Aaker 1996; Keller 2012). Proponents of this view claim that a brand must be single-minded in its messaging to avoid confusing or even alienating existing customers (Colasanti 2004). Wal-Mart executives, for example, recently blamed their worst sales slump in corporate history on a misguided attempt to move away from their well-established position of everyday low prices to a high-low pricing model that involves raising prices in some categories and offering promotional discounts (Bustillo 2011).

In contrast to the view that brand-related messages should be temporally consistent, proponents of *market consistency*¹ (MC) emphasize the need to keep brands “...in line with the tastes of today’s new consumers, not those of yesterday’s” (Kapferer 1997, p. 333). Keller et al. (2002, p. 86) warn that “the challenge is to make sure [the brand] stays up-to-date and in touch with consumers’ shifting needs.” The repositioning view is illustrated both by the fading of once-popular brands (e.g. Blackberry) and by the success of recent brand repositioning strategies such as Old Spice (Crowley 2011). When consumer preferences change, brand managers must choose between remaining true to the brand’s heritage (i.e., TC) and repositioning their brand to what is most valued by customers (i.e., MC).

Despite an extensive body of research on both branding and advertising, the marketing literature has only touched on the tradeoff that managers face between remaining consistent with the current marketing strategy and repositioning to respond to changing consumer needs (Keller 1993). Common wisdom holds that temporal consistency is critical to building brand equity and achieving long-term sales and market share (Erdem and Swait 1998; Keller 2003; Park et al. 1986; Ries and Ries 2002; Trout and Ries 1979). However, most of the empirical evidence is based on fictional or young brands. As a result, brand managers may rely on rigorously researched advice on *building* brands, but much less research on *maintaining the relevance* of mature brands. Likewise, in economics, the hedonic pricing literature has assumed stable preferences in its view that market mechanisms lead to efficient and equilibrium pricing of

¹ It is important not to confuse ‘temporal consistency’ with the generally accepted view that, at any given point in time, brand communication should be internally consistent (e.g. Keller 1993). Likewise, the ‘market consistency’ view holds that the brand’s *message* or *claim* should change with the times, which differs from the generally accepted advice to vary *ad execution* and to strive for *ad originality* (e.g. Pieters, Warlop, and Wedel 2002).

product characteristics that are valued by consumers (Rosen 1974). Both economic and past marketing applications of hedonic pricing theory yield a snapshot of consumers' willingness-to-pay (WTP)² for an attribute (Agarwal and Ratchford 1980; Boulding and Purohit 1996; Erickson and Jacobson 1992; Van den Abeele et al. 1990). While appropriate to explain cross-brand price differences *at a given point in time*, the stability assumption limits the theory's power to explain how and why hedonic price coefficients may drastically *change over time* (Edmonds 1984; Murray and Sarantis 1999). In sum, both marketing and economics literature lack a systematic analysis of how changing consumer preferences affect the marketing strategies and success of both young and mature brands.

This paper contributes to the theory and practice of advertising message dynamics in three ways. First, we define and operationalize the key constructs of *temporal consistency* and *market consistency* in advertising messaging. We measure temporal consistency by coding appeals contained in advertising for each brand over a long period of time. We are the first to empirically distinguish between two ways in which advertising can be temporally consistent: messages and executions. Whereas advertising messages reflect the brand's underlying associations and therefore both its current position and long-term equity, executional elements reflect *how* the message is communicated as reflected by characteristics such as the use of celebrities, animation, music, and emotional content. Whereas prior research demonstrated that sales increase with advertising copy changes (Lodish et al. 1995), it did not separate changes in

² In 'hedonic regression', willingness to pay for each attribute is assessed by regressing each product's price on its attributes, thus revealing how much money each attribute fetches in the market. The assumption is that customers reveal through the paid price how much they like (hence 'hedonic') higher levels of the attribute.

message versus execution. Therefore, our research distinguishes between these two ways in which advertising can vary and accounts for both types of changes in our models.

We also quantify *market consistency* as the degree to which advertising messages are consistent with the importance the market's consumers attach to the advertised attribute, as revealed in their willingness to pay for that attribute. This variable is created via biennial hedonic regressions of products' price on quality elements to create a comparative perspective on what is valued by consumers over time. We assess consumers' willingness to pay on the four key elements of minivan quality in *Consumer Reports*: performance, comfort, cost of ownership, and safety. Our approach enables us to reflect changes in market preferences based on the willingness-to-pay for these four key benefits as the category evolves. Comparing advertising messaging with consumers' revealed willingness-to-pay allows us to estimate the *market consistency* of the brand's advertising.

Our third contribution is to assess how the effects of TC and MC vary over the life of the brand. Building on research in both information economics and cognitive psychology, we hypothesize differences in consumer knowledge for young versus mature³ brands. These differences, in turn, pose important implications for the types of marketing strategies that are effective at each stage of the brand's life. Our conceptual framework enables a test of the relative importance of TC and MC over the life of the brand. We are also able to assess whether brands can compensate for low TC with higher MC, and vice versa.

³ As previous research does not pinpoint when a brand becomes 'mature', we use brand age as a variable and show empirically that the main effects of consistency become insignificant after 6 years in our studied market.

Our rich dataset and analysis approach enable us to control for product quality, price, distribution intensity, advertising spending and emotional content, sales inertia, and the endogeneity of the preceding marketing mix decisions within the US minivan market. We find that the importance attached by consumers to relevant product attributes changes substantially over the 14-year window of our study, enabling us to test the relative importance of temporal and market consistency and how they vary over the life of the brands. This empirical setting provides evidence for the view that both temporal and market consistency are beneficial for younger brands. When brands are young they should identify the attributes that are most valued by the target market and incorporate them in advertising messages that are used consistently over a long period of time. In contrast, more mature brands have two strategic options. The first option is consistent with the TC view of sticking to a central advertising message. The second option is consistent with the MC view. Specifically, mature brands have a sales lift when they update their advertising messages to reflect changing market preferences. Our key new insight is that, when a mature brand manages to do so, temporal consistency does not benefit sales. Still, the absence of both temporal and market consistency hurts sales also for mature brands. Our research thus helps reconcile seemingly conflicting arguments and empirical findings related to temporal versus market consistency. In particular, our findings are new and directly useful to managers responsible for maintaining the relevance of mature brands.

CONCEPTUAL FRAMEWORK AND HYPOTHESES

Our conceptual framework is based on an integration of three distinct research streams. Building on prior work in cognitive psychology and information economics, we first develop hypotheses linking brand sales performance outcomes to the temporal consistency of advertising messaging. To this, we add insights from the well-developed literature on market orientation, so as to hypothesize the effect of market consistency on sales. We also consider how each facet of consistency might impact sales differentially as the brand evolves.

Temporal and Market Consistency

The temporal consistency view is based in both cognitive psychology (Park et al. 1986; Keller 1993) and information economics (Erdem and Swait 1998). This perspective advocates the building and maintenance of a single brand concept over time, and decries brand positioning strategies based on "...short-term, market-driven factors such as current consumer needs or competitors" (Park et al. 1986, p. 135), on the grounds that such repositioning strategies can create confusion and dilute brand equity (Ries and Ries 2002). In the event that consumer preferences change, managers are advised to introduce a new brand because consumers have strong beliefs about mature brands that are difficult to change in the short-term. Related work using an information economics-based lens indicates that advertising messages act as signals that convey information about the brand to consumers, and that, "...it is important that both the individual brand claims and the brand attribute levels are consistent over time. This temporal consistency is likely to ensure the clarity of brand position information provided and to enhance its credibility" (Erdem and Swait 1998, p. 154). In summary, both leading practitioners (e.g., Trout and Ries 1979; Ries and Reis 2002) and academic researchers (Braun-LaTour and LaTour 2004) strongly advocate temporal consistency in messaging, while brands are advised to vary the

executional elements of this consistent message to avoid ad copy wearout (Naik, Mantrala, and Sawyer 1998).

Anecdotal evidence suggests that many of the most successful advertising campaigns are based on a single message that remains consistent over a long period of time but also exhibits variations in the executional elements to remain relevant. Absolut vodka, for example, used a very similar message in the U. S. over more than 20 years from its introduction in 1980. Each ad featured an Absolut bottle-shaped object in the ad and the title “ABSOLUT ____.” The campaign remained fresh because each ad linked the brand to popular culture through references to movies, celebrities, locations, objects, works of art, and so forth. The essential message was that Absolut is the (absolutely) highest-quality vodka, and that it is part of popular culture. The “Milk Moustache” campaign had a similar formula. It used a long list of celebrities with the message that milk is healthy, and is consumed by athletes, movie stars, and other celebrities. Campaigns by other firms including Nike (authentic athletic performance), Disney (family entertainment), Intel (fast and compatible processing) and Kia (low cost of ownership) also exhibit variations in executional cues but remain true to their essential brand appeal. These examples support the view that it is imperative that firms take a long term perspective on brand management. Formally,

H1: The higher the temporal consistency of a brand’s advertising messages, the higher its sales.

While the temporal consistency view focuses on reinforcing existing brand associations, it is also important that advertising focus on the associations (i.e., benefits) that are the most relevant and important to target consumers. Keller et al. (2002) argue that brand managers must ensure that their brands’ points of difference and points of parity are relevant to consumers. Points of parity are attributes that customers have come to expect from any brand they would

consider in the product category, whereas points of difference help the brand stand out from its competition. A brand's advantage on an attribute may change over time from point of difference to point of parity, as it gets matched by competitors and customers start taking it for granted (e.g. a certain level of comfort). Likewise, new technology (e.g. antilock brakes) or macro-economic factors (e.g. increasing fuel prices) may lead the attribute to become a point of difference as some products have an advantage, for which customers are willing to pay more (Pauwels and D'Aveni 2014). Keller et al. (2002, p.86) warn that "...the challenge is to make sure [the brand] stays up-to-date and in touch with consumers' shifting needs." If one should "Ask not what the brand can evoke; ask what can evoke the brand..." (Holden and Lutz 1992), then ensuring that advertising messages are aligned with consumer priorities (e.g. safety, cost of ownership,...) should increase brand relevance and sales.

The potential for achieving significant sales increases by repositioning a mature brand through advertising is illustrated by Old Spice's "The Man Your Man Could Smell Like" campaign. The Old Spice brand was introduced in the 1930's and was positioned as a very masculine brand, which did not make it stand out positively in the deodorant market dominated by Axe (positioned on male conquest). Not surprisingly, sales declined to a sliver of the market. Wieden+Kennedy's 2010 campaign changed the message to appeal to women who make or influence choices with respect to men's deodorant, body wash, and other hygiene products. The brand's YouTube channel received more than 94 million views and attracted more than 120,000 subscribers (Parpis 2010). More importantly, the campaign is credited with increasing sales of Old Spice by over 107 per cent (Cohen 2010). Likewise in the minivan market, the Dodge Caravan positioned itself on safety in the 1990-1997 period, while the Ford Mercury Villager repositioned on cost of ownership in 1997 (see data section).

The emphasis on market consistency is deeply rooted in the literature on market orientation (Kohli and Jaworski 1990; Narver and Slater 1990; Noble, Sinha, and Kumar 2002). One of the critical components of market orientation is customer orientation (Narver and Slater 1990) and responsiveness to market intelligence (Kohli and Jaworski 1990). Narver and Slater (1990, p. 21) define customer orientation as all "...activities involved in acquiring information about the buyers ... in the target market and disseminating it throughout the business." They argue that businesses must understand and respond to customer needs as these needs evolve over time. Likewise, Kohli and Jaworski (1990) consider organization-wide intelligence gathering, dissemination, and *responsiveness to* intelligence as the key elements of a market orientation. This body of work therefore suggests that firms should change their strategies, marketing, and marketing communications as consumer preferences evolve. Based on this logic, maintaining consistency with changing market needs should help the brand remain relevant to consumers as their preferences change. Formally,

H2: The greater the market consistency of a brand's advertising messages, the higher its sales.

Effects of Brand Maturity

Although we expect that both TC and MC have positive effects on brand sales, we build on research in both information economics and cognitive psychology to argue that their relative importance changes dramatically over a brand's life. Prior research suggests that the types of advertising appeals that are effective in young versus mature markets are different because of variations in consumer product experience and knowledge (Chandy et al. 2001; Lynch and Srull 1982; Machleit, Madden and Allen 1993; MacInnis, Rao, and Weiss 2002). We develop our next

hypotheses to reflect changes in the degree to which consumers seek out and respond to product and brand-related information via advertising and other sources as a brand matures.

An information economics perspective implies that brand signals are most relevant in markets that are characterized by imperfect and asymmetric information (Erdem and Swait 1998). Information asymmetry is likely to be higher for young brands because consumers have had little exposure to these brands and therefore both familiarity and expertise are low. From a signaling perspective, consistent advertising messaging reduces the perceived variability and ambiguity of brand attributes, which decreases consumers' purchase risk and information costs (Erdem and Swait 1998; Erdem and Swait 2004). The greatest gains from message repetition should be early in the brand's life when consumers' brand knowledge is low and they are relatively unsure about essential brand meanings and associations. Repeated brand messaging reinforces the brand's position, requires less cognitive processing than varied messages, and therefore increases the speed at which consumers gain brand knowledge.

Cognitive psychology generates a similar prediction to information economics with respect to the importance of temporal consistency early in a brand's life. Kent and Allen (1994) report that consumers have better recall of new advertising claims by familiar compared to unfamiliar brands. Likewise, Lange and Dahlén (2003) report that novel messages that are incongruent with the existing brand image, increase brand attitude and memorability for familiar but not for unfamiliar brands. Young brands appear especially vulnerable to temporal inconsistency because compared to mature brands they are less familiar and have yet to build up strong associations in consumer memory (Srull et al 1982).

In contrast, brand familiarity and expertise are high for mature brands because consumers have either direct product experience or knowledge of the brand through the communicated

experience of others, third-party evaluations, trial, and past advertising. Brand signals about quality and other benefits are less important because consumers have formed well-established beliefs about the brand (Dahlén and Lange 2004). Hence, advertising consistency has less impact for mature brands compared to younger ones—consumers are less likely to seek brand-related information because they believe they are well-informed (MacInnis, Rao, and Weiss 2002).

The challenge for older brands shifts from strengthening associations to making these associations salient and relevant to customer priorities. Temporally-consistent messages for mature brands are subject to message wearout that reduces the interest and attention to advertising (Machleit et al. 1993; Tellis 1997). Lange and Dahlén (2003) find that a new message for a familiar brand increases brand interest and memorability, even though consumers tend to resist new information and evaluate the ad less favorably. New messages for familiar brands stimulate arousal, curiosity, interest and message involvement, in turn leading to more careful cognitive processing and elaboration and higher persuasion (Lange and Dahlén 2003). Hence, temporal consistency should be more important for younger versus older brands:

H3: The younger the brand, the greater the effect of temporal consistency on its sales.

We also expect young brands to be especially vulnerable to market inconsistency. Given that the challenge for young brands is to break through the clutter (Kent and Allen 1994), brands that fail to address contemporary consumer priorities are likely to die young. In contrast, mature brands should be better able to weather the storm of shifting consumer needs. They have built up customer loyalty, which creates the lock-in that may shield their sales from market inconsistency. For instance, when a recession increases consumer sensitivity to prices, mature brands often have an easier time holding on to their customers as recessions also increase people's risk aversion (Bollerslev, Gibson, and Zhou 2011). This rationale is consistent with the

established link between brand equity and lower vulnerability of cash flows (Madden, Fehle and Fournier 2002, Srinivasan et al. 2009). Therefore, we posit:

H4: The younger the brand, the greater the effect of market consistency on its sales.

Up to this point, our discussion has remained focused on hypothesizing the impact of each facet of consistency over the life of the brand. Although we expect that both temporal and market consistency have a positive effect on brand performance, changing consumer preferences may make it impossible for a brand manager to fully accomplish both. This raises a number of important yet hitherto unaddressed questions as to possible combinatorial effects of temporal and market consistency: *Can mature brands “make up” (compensate) for low levels of consistency on one dimension with high levels on the other? What is the impact on sales of having consistency on neither dimension? On both dimensions?* Existing theory has little if any guidance to offer with respect to these questions, thus precluding our ability to propose formal hypotheses on their likely effects. Instead, we test for all these possibilities empirically, and comment on the inferences we are able to draw from our current context.

METHOD

Research Context

The minivan sector represents an important category in one of the oldest and most important industries in the U. S. (Rosa et al. 1999). Advertising-based competition is a matter of great strategic importance to brands competing in this category. The birth of this category is also relatively recent with the launch of the first 3 brands in 1983 (Rosa et al. 1999). Due to the low number of products on the market in 1983-1989, our analysis starts in 1990 and runs till 2003,

spanning the growth period of the category as well as its subsequent maturation. Each of the 20 brands in our study had (i) attained at least 1 per cent market share over the life of the brand, (ii) received ongoing advertising support, and (iii) been identified as minivans by other researchers studying this category (Rosa et al. 1999) and by third-party automotive rating agencies like Consumer Reports, J.D. Powers, and Autopinions.

Data Collection

We collected data on each brand from four different sources over the 14-year period of interest. Monthly sales data, manufacturer suggested resale price (MSRP), and distribution intensity (number of US dealers) were obtained for all minivan brands from *Ward's Automotive Yearbook*. To these, we added quality ratings for each brand from *Consumer Reports*, and information on monthly advertising budgets for each brand from *Competitive Media Reporting*. Lastly, we examined the advertising message content of each brand by undertaking a census of minivan advertisements featured in the seven top-ranked U.S. magazines (based on advertising revenues for U.S. magazines listed in the *Adweek Performance Index*) over the 14-year period.

Our choice of print media was driven by the fact that print advertising represents about 40% of total advertising expenditures across all media (TNS Media Intelligence Press Release 2004). Moreover, the specific message content of print advertisements was available in archival form, thus enabling a comprehensive view of evolving ad content for every brand in the category. Given firms' integrated marketing communication efforts, their advertising in print media is highly likely to be consistent with messaging across other marketing channels (TV, radio, etc.). The particular publications included in our study covered news (*Time*, *Newsweek*), entertainment (*People*), sports (*Sports Illustrated*), business (*BusinessWeek*), and home

decoration (*Better Homes and Gardens*, and *Good Housekeeping*), targeting a wide range of consumers. The selected magazines accounted for advertising revenues of approximately \$4 billion in 2004.

Coding Procedure

We coded the content of each of the 554 unique ad executions (around 1,600 ad placements). An ad was considered a unique execution either when anything in the ad – the image, background color, number of people, animals or characters, text in the ad, or size of the ad – changed. As to coding the advertising message, we focus on the attributes emphasized in each ad. An attribute is a characteristic of the product being advertised. Relevant attributes for the minivan category include acceleration, braking distance, flip-fold seating, child locks, and so forth. We employed a two-stage approach to elicit a comprehensive list of attributes or benefits that may be featured in the advertising messages. In the first stage, we identified the 28 attributes used by *Consumer Reports (CR)* to arrive at their annual minivan ratings. These attributes are grouped by *CR* into four dimensions of performance, comfort, cost of ownership, and safety. *CR* uses these four dimensions to rate all automobiles sold in the US. We augmented these original attributes with 31 additional attributes (each belonging to one of the above four dimensions), based on an examination of 50 randomly chosen ads from the dataset. Two independent coders, blind to our hypotheses, coded each of the 554 unique advertisements in the sample for the occurrence (presence/absence) of each attribute in each advertisement (Chandy et al. 2001; MacInnis, Rao, and Weiss 2002). This process yielded a binary score for each of the 59 attributes in each of the 554 unique ad executions. Average inter-coder reliability was .93 and disagreements were resolved through discussions at the end of each day's coding.

Unit of Analysis

The unit of analysis is the brand i 's sales, observed t months since its inception. Several companies compete in this category with multiple brands, which are positioned in different ways (for example, General Motors had seven brands in the category – the Astro, Lumina, Montana, Trans Sport, Safari, Silhouette, and Venture). Accordingly, we denote each competitor at the individual brand level, rather than at the level of the parent firm.⁴ Subsequent checks of the variance-covariance matrix revealed no additional significant variation on sales by division, or company, once brand-level differences are accounted for. Table 1 provides descriptive statistics for each brand. To guard against harvesting strategies affecting our results, we removed a brand from further consideration when its advertising spending (1) dropped to zero and (2) remained there until it was withdrawn from the market. (Tables and figures follow References.)

Table 1 provides some useful insights into the advertising dynamics of the minivan brands. First, note that brands typically change their advertising execution during the year (last column of table 1). For instance, Ford Freestar did not change its advertising message in its 4 years on the market (temporal consistency of 0), but did change its execution on average twice a year. Second, particularly relevant to our research focus, we observe brands with varying degrees of temporal and market consistency. Comparing the brands' scores with their market share, we observe both combinations that appear consistent with, and combinations that appear to belie common wisdom. On the one hand, Ford Aerostar and Windstar score high on temporal consistency and each achieve over 15% market share. On the other hand, Plymouth Voyager and

⁴ We assessed but did not find company- (e.g. General Motors) or division- (e.g. Plymouth, GMC, Pontiac, Oldsmobile) specific effects on sales.

Dodge Caravan achieve over 18% market share with low temporal consistency, and several brands with high temporal consistency have market shares under 3% (e.g. GMC Safari and Mazda MPV). Overlaying this with similar observations for market consistency shows that a single-minded narrative about any of these brands fails to capture the nuanced effects of temporal and market consistency – we need a model to tease these effects apart.

Measures

Criterion Variable – Unit Sales (S). The unit sales of the brand capture both the primary and secondary demand effects of advertising on brand performance. Primary demand expansion in the minivan category may come from the broader vehicle market, e.g. from station wagons. Using brand unit sales is also consistent with prior studies of advertising effects (Clarke 1976; Lodish et al. 1995; Tellis and Franses 2006). Average monthly sales across the brands are 6775 units (standard deviation = 6488).

Predictors. Attribute Importance Ratings. We conducted a principal component factor analysis of the 18 attributes that *Consumer Reports* used most consistently over the 14 years to rate minivans. This factor analysis yielded a four-factor solution comprising cost of ownership, performance, comfort, and safety (*Consumer Reports* had also classified the 18 items into the same four factors). Table 2 displays the relevant descriptive statistics.⁵

In order to uncover consumers' willingness-to-pay for the four facets, we rely on a hedonic regression-based approach. Prior research in economics (Rosen 1974) and subsequent applications to the marketing context (Agarwal and Ratchford 1980, Boulding and Purohit 1996,

⁵ Note that all four facets have similar means and standard deviations, thereby allowing us to directly compare a change in consumers' willingness to pay for a one-unit increase in each quality dimension.

Erickson and Jacobson 1992, Van den Abeele et al 1990) postulate that product market mechanisms lead to efficient and equilibrium pricing of quality characteristics, representing customers' valuation (willingness-to-pay) for said quality characteristics. Weighting each product by its sales corrects for heteroscedasticity in the linear functional form⁶ (Arguea and Hsiao 1993; Murray and Sarantis 1999). To reveal changes in consumer willingness-to-pay (Edmonds 1984; Murray and Sarantis 1999), we take a comparative statics view in estimating the hedonic regression equation for distinct time intervals over the life cycle of the minivan category. Specifically, we regress the minivan model's price in 2003 dollars (i.e. adjusted for inflation) on the four relevant quality dimensions (cost of ownership, safety, performance, and comfort), import or domestic status, and annual advertising spending. The Appendix provides details on the hedonic regression analysis, and Table 3 displays consumers' willingness-to-pay for specific quality dimensions. As evident from Table 3, their relative importance changed substantially over the data period as shown in Figure 1.

Market Consistency (MC). Market consistency is defined as the extent to which advertising messages conform to consumers' overall willingness to pay for the four dimensions that determine brand quality (i.e., performance, cost of ownership, safety, and comfort). For the advertising of brand i in month t , the sum of the scores of all indicators of dimension j represents the emphasis score, e_{ijkt} , for dimension j and placement k . E_{ijt} is the monthly emphasis score for quality dimension j , which is derived by aggregating the emphasis scores for the dimension across all placements of the brand in month t (i.e., $E_{ijt} = \sum_k e_{ijkt}$). The relative advertising

⁶ Using the log-linear and the log-log functional specification yields the same substantive results; estimation results for these specifications are available upon request.

emphasis placed by brand i on quality dimension j in month t is computed as $R_{ijt} = E_{ijt} / \sum_j E_{ijt}$. MKC_{it} is the Euclidean distance between the brand's advertising emphasis on each dimension and consumers' relative willingness to pay ($RWTP_{ij}$) for that dimension. Formally, $MKC_{it} = (\sum_j (R_{ijt} - RWTP_{ij})^2)^{0.5}$. MKC_{it} therefore reflects the difference between the brand's advertising and market preferences for brand i in month t . Market consistency is $MC_{it} = -1 * MKC_{it}$ so that higher values on the measure indicate a greater consistency between a brand's advertising messages and the benefits sought by consumers with respect to performance, cost of ownership, safety, and comfort.

Temporal Consistency (TC) is the extent to which the brand's advertising messages are uniform over time. A key issue is the appropriate window of time over which market consistency is to be assessed. Comparing the messages used in one month to those of the previous month (i.e., a one-period lag) would result in a large amount of missing data because many brands were advertised sporadically. On the other hand, comparing the messages used in the current month to those used across all previous months of the brand's life would not acknowledge the decay in advertising recall that occurs over time. Prior research suggests that advertising effects last between six and nine months (Clarke 1976), but that the duration is longer for durable products (Vakratsas and Ambler 1999). We therefore selected a 12-month horizon for our temporal consistency measure so as to minimize missing data occurrences while capturing memory

effects. Our measure of consistency, therefore, reflects the extent to which the focal brand's advertising in month t differs from its advertising over the past 12 months.⁷

The standard deviation of the relative emphasis (R_{ijt}) score for the brand i on dimension j over the last 12 months represents variations in advertising messaging with respect to dimension j , TIC_{ijt} (Swait and Erdem 2002). We then compute TIC_{it} , the temporal inconsistency of advertising for brand i in month t , as $[(\sum_j TIC_{ijt})]$. Temporal Consistency then is $TC_{it} = -1 * TIC_{it}$ so that higher values on this measure indicate higher consistency.

The resulting measures for MC (mean -0.61, standard deviation 0.24) and TC (mean -0.14, standard deviation 0.26) are only correlated 0.12 with each other and respectively 0.05 and -0.04 with the age of the brand on the market.

Control Variables. In order to isolate the effects of advertising message content as cleanly as possible, we control for a large number of additional advertising-, marketing mix-, brand-, category-, and time trend-specific covariates. With respect to other advertising-related variables, we controlled for the number of new ad executions for the brand that year (*EXEC*) and the advertising spending of the brand (*AI*). Our marketing mix-related control variables include the number of dealers selling the brand (*DI*), quality ratings by *Consumer Reports* for each brand (*QUAL*), the manufacturer's suggested retail price (*PR*), and national-level financial promotions advertised by the brand (*PROMO*). We also control for whether the brand is an import (*IM*) (Mela et al. 1997), and the age of the category when the brand was introduced (*IN*). Finally, we

⁷ In addition to our chosen window of the prior 12-month period, we also computed 6, 9, 15, 18, 24, and 36-month measures of temporal consistency. As we discuss subsequently, our results remain robust to the periodicity of consistency.

include the total sales in the category (*CATS*), and linear and quadratic terms for the age of the brand (*AGE*).

Model Specification

We regressed brand sales (S_{it}) on our predictors and control variables. Consistent with the literature on advertising effects (Clarke 1976; Tellis and Franses 2006), and because monthly sales of the brand do not change drastically from one month to the next, we include the previous month's sales as a predictor. We specify the model at its most disaggregate level to obtain unbiased and efficient estimates. Specifically,

$$S_{it} = \alpha + \beta_1 PR_{it} + \beta_2 AI_{it} + \beta_3 DI_{it} + \beta_4 IM_i + \beta_5 EXEC_{it} + \beta_6 QUAL_{it} + \beta_7 CATS_t + \beta_8 IN_i + \beta_9 PROMO_{it} + \beta_{10} TC_{it} + \beta_{11} MC_{it} + \beta_{12} MC_{it} * TC_{it} + \beta_{13} AGE_{it} + \beta_{14} AGE_{it}^2 + \beta_{15} S_{it-1} + u_i + e_{it} \quad (1)$$

where t = time in months since the introduction of the brand, u_i and e_{it} are brand-specific and random error terms respectively, and the errors are assumed to be distributed $N(0, \sigma^2)$.

Recall that we have hypothesized time-varying impacts of temporal consistency (TC), market consistency (MC), and their interaction. We accommodate such a possibility by specifying multiplicative interactions of each of these variables with the brand's age. As well, we assess potential combined effects of temporal and market consistency over time by including a three-way (higher order) multiplicative interaction of TC, MC, and AGE. Incorporating these interactions into Eq(1), we get:

$$S_{it} = \alpha + \beta_1 PR_{it} + \beta_2 AI_{it} + \beta_3 DI_{it} + \beta_4 IM_i + \beta_5 EXEC_{it} + \beta_6 QUAL_{it} + \beta_7 CATS_t + \beta_8 IN_i + \beta_9 PROMO_{it} + \beta_{10} TC_{it} + \beta_{11} TC_{it} * AGE_{it} + \beta_{12} MC_{it} + \beta_{13} MC_{it} * AGE_{it} + \beta_{14} MC_{it} * TC_{it} + \beta_{15} MC_{it} * TC_{it} * AGE_{it} + \beta_{16} AGE_{it} + \beta_{17} AGE_{it}^2 + \beta_{18} S_{it-1} + u_i + e_{it} \quad (2)$$

The above specification provides a simple yet highly flexible interpretation of the impact of the message characteristics on brand sales. For example, to infer the time-varying impact of temporal consistency (TC), we examine the statistical significance and sign of the coefficients

for the main effect (β_{10}) and its interaction with brand age (β_{11}). To assess the overall impact of TC on brand sales we examine its main effect (β_{10}), its interaction with brand age (β_{11}), its interaction with MC (β_{14}), and its three-way interaction with MC and brand age (β_{15}). Such analyses allow us to ascertain how the impact of TC on sales varies as a function of the brand's age and the extent to which it is aligned with consumers' willingness-to-pay (MC).⁸

An additional factor to account for is the likely endogeneity of the marketing mix-related regressors. Not accounting for endogeneity can lead to a considerable bias in estimation and incorrect inferences (Baltagi 2005). A Hausman specification test of the above equation indicates that some of the independent variables in Eq(3) are endogenous ($\chi^2_{(11)} = 104.04, p < 0.001$). This Hausman test compared a fixed effects model with a random effects model and shows that some of our independent variables are correlated with the error term. To test whether this endogeneity is due to the independent variables being correlated with the random error e_{it} , we used the instrumental variables (IV) approach using Lewbel's suggested instrumental variables (Lewbel 1997; Ebbes, Böckenholt, and Wedel 2004). The Hausman test comparing the fixed effects model with this IV model ($\chi^2_{(11)} = 104.04, p < 0.001$) indicates that our independent variables are not correlated with the random error term. The Hausman-Taylor (HT) estimator is the appropriate method when some of the independent variables may be correlated with the individual-level or brand-specific error (u_i) but they are not correlated with the random error (e_{it}). In addition, in contrast to fixed-effects (fe) estimators, the HT estimator allows us to assess the

⁸ The results of these simple slopes analyses are discussed in the results section.

impact of the time invariant variables on sales. We therefore use the HT estimator to account for endogeneity (variables in bold are deemed to be endogenous):

$$S_{it} = \alpha + \beta_1 \mathbf{PR}_{it} + \beta_2 \mathbf{AI}_{it} + \beta_3 \mathbf{DI}_{it} + \beta_4 \mathbf{IM}_i + \beta_5 \mathbf{EXEC}_{it} + \beta_6 \mathbf{QUAL}_{it} + \beta_7 \mathbf{CATS}_t + \beta_8 \mathbf{IN}_i + \beta_9 \mathbf{PROMO}_{it} + \beta_{10} \mathbf{TC}_{it} + \beta_{11} \mathbf{TC}_{it} * \mathbf{AGE}_{it} + \beta_{12} \mathbf{MC}_{it} + \beta_{13} \mathbf{MC}_{it} * \mathbf{AGE}_{it} + \beta_{14} \mathbf{MC}_{it} * \mathbf{TC}_{it} + \beta_{15} \mathbf{MC}_{it} * \mathbf{TC}_{it} * \mathbf{AGE}_{it} + \beta_{16} \mathbf{AGE}_{it} + \beta_{17} \mathbf{AGE}_{it}^2 + \beta_{18} \mathbf{S}_{it-1} + u_i + e_{it} \quad (3)$$

Our model specification accounts for (a) sales inertia, (b) potentially differing temporal and market consistency effects over time, and (c) endogeneity of time-varying and time-invariant regressors.

RESULTS

Table 4 displays the estimated coefficients for the Hausman-Taylor regression. The fit statistics appear satisfactory ($\chi^2_{(18)} = 3567.35, p < 0.001$), and the signs of the estimated coefficients are as expected. Hypothesis H₁ posited a positive relationship between temporal consistency and brand sales. The positive impact of temporal consistency on sales was also hypothesized in H₃ to be strongest for younger brands (i.e., to diminish as the brand matured). We find evidence consistent with H₁; the main effect of temporal consistency is positive and statistically significant ($\beta_{10} = 1685.51, p < .05$). Moreover, the coefficient corresponding to the multiplicative interaction of temporal consistency with brand age suggests a diminishing positive effect from the onset of the brand's life ($\beta_{11} = -26.92, p < .001$). Thus we find support for H₃ as well. Hypothesis H₂ proposed a similar positive effect for market consistency on the brand's sales. Similar to the case for temporal consistency, we posited in H₄ that this positive impact would attenuate as the brand matured. We thus find evidence consistent with H₂ ($\beta_{12} = 1239.13, p < 0.01$) and H₄ as well ($\beta_{13} = -18.96, p < .001$).

We find a negative and statistically significant three-way interaction involving temporal and market consistency and the brand's age ($\beta_{15} = -30.41, p < .01$). The two-way interaction involving temporal and market consistency is not significant ($\beta_{14} = 1318.56, n.s.$). We probe this three-way interaction in the section that follows.

With respect to the control variables, advertising intensity ($\beta_2 = 0.09, p < .001$), the brand's third-party quality ratings ($\beta_6 = 193.59, p < .01$) and national-level financial promotions ($\beta_9 = 1.15, p < .01$) have a significant and positive impact on brand sales. As expected, the number of new executions for the brand in the year has a positive impact on sales ($\beta_5 = 44.46, p < .05$) and the greater the number of dealers selling the brand, the higher the brand's sales ($\beta_3 = 1.30, p < .05$). Manufacturers' suggested retail price (*PR*), expectedly, had an inverse relation with sales ($\beta_1 = -0.40, p < .001$). Neither the import status of the brand ($\beta_4 = 2675.18, n.s.$) nor the timing of its market launch ($\beta_8 = 2.78, n.s.$) has a significant impact on sales. One period lagged sales ($\beta_{18} = 0.59, p < .001$), category-level sales ($\beta_7 = 0.05, p < .001$), and the age of the brand ($\beta_{16} = 20.34, p < .001$) are all related positively to brands' current sales performance, while AGE^2 is negatively related to brand sales ($\beta_{17} = -0.12, p < .001$).

Young versus Mature Brands

We undertook simple slopes analyses of all the significant interactions to better understand the effects of temporal and market consistency for young versus mature brands (Aiken and West 1991). Although the main effects of both TC and MC are positive, an examination of their simple slopes for young and mature brands indicates that the positive effect of TC becomes insignificant when the brand is about 63 months old; similarly, the positive effect of MC becomes insignificant at about 65 months. Hence, by the time the brand is about six years old, neither temporal nor market consistency, by themselves, have significant sales effects.

Given the significant three-way interaction, we undertook tests of significance of the simple slope coefficients of TC on sales for different combinations of low versus high levels of MC and AGE (Aiken and West 1991; See Figures 2A, 2B). The positive and significant simple slope of TC on sales for both low versus high MC levels and the low brand AGE condition indicates that young brands achieve higher sales by increasing the temporal consistency of their advertising messages at both high and low levels of market consistency. In our data, a few young brands, such as the Kia Sedona, succeed in keeping up both forms of consistency.

Mature brands, on the other hand, have some strategic flexibility to vary the temporal consistency of their advertising when their MC is high – they may either change their advertising messages or stay consistent with their prior message (the simple slope of TC on sales under the high MC condition is not significant, indicating no additional effect of TC on sales under high MC). Mature brands with low MC, however, are better off increasing their TC – the simple slope of TC on sales under the low MC condition is significant and positive, implying an additional positive effect of high TC on sales when MC is low.

The picture that emerges from this post hoc probing sheds light on brands' messaging strategy – for younger brands, temporal and market consistency of messaging are both important; as they mature, brands may compensate for a lack of market consistency by maintaining high levels of temporal consistency of their advertising message.⁹ Importantly, our simple slopes tests suggest that, compared to mature brands that have high market consistency, no further sales increases are achieved by mature brands that are *both* temporally and market consistent.

DISCUSSION

When consumer preferences change, as in the US minivan category between 1990 and 2003, it is tough for brands to be consistent in their advertising message both over time and with the market's willingness to pay for specific dimensions. Our findings confirm our hypotheses that both temporal and market consistency increase brands sales, but that these benefits decrease over the brand's life cycle. While we recommend young brands strive for both temporal and market consistency, mature brands can choose either route to continued sales success.

Our research is the first to address this conflict between temporal and market consistency and to provide clear guidance as to when brand managers should emphasize one or both of these orientations. Should firms ensure that brand-related messages are consistent over time? Or should they adapt these messages to reflect dynamic customer needs and wants? Attaining a competitive advantage depends on firms ensuring that target consumers understand what is unique and valuable about their brand offerings. Advertising messaging represents a calculated

⁹ Although our analysis indicates that three of the four simple slopes of TC are statistically significantly different from zero, it should be noted that nothing can be said about the difference between two specific points on different simple slope lines (Dawson and Richter 2006) – the closed form solution for such a test exists for a two-way interaction (Pedhazur 1997), but the three-way analog has yet to be derived.

attempt by firms to communicate the unique value they offer consumers. It therefore provides important insights into the marketing strategy for the brand and enables us to make inferences about the types of marketing strategies that are effective in driving sales and other performance outcomes. Our research provides useful guidance for both short-term positioning and long-term brand equity management. We discuss the specific results for each of the message characteristics in the remainder of this section.

We found evidence that firms should use very different advertising strategies during the young and mature phases of a brand's life. For young brands, the best sales strategy is to identify messages that are closely aligned with consumer preferences within the category and reinforce those messages over time. This strategy supports the key role of temporal consistency when brands are young and the new brand is able to select a position that is highly valued by consumers. But we also found that even when it is infeasible to select a position that is most closely aligned with consumer preferences, the young brands in our study always benefited from being temporally consistent compared to inconsistent brands. These findings support H1 and H2, which argue for the need for brands to be aligned with market preferences and to reinforce brand knowledge through tactical elements such as advertising. Temporal consistency appears to be of fundamental value for young brands because it is at this time in a brand's life that consumers have least familiarity and brand knowledge, which makes their preferences somewhat malleable. Firms may be able to shift brand preferences somewhat by focusing on attributes that have not been promoted by competitors or are entirely new to the market.

In contrast, we found that sales of mature brands increased from temporal consistency only when they were less aligned with market preferences. Sales of mature brands that were not closely aligned with consumers' willingness increased from temporal consistency. In line with

our rationale for H3, consumers are more knowledgeable about mature brands. For mature brands that were consistent with market preferences, there was no additional effect on sales when their advertising messages remained consistent over time. Yet, when mature brands reinforced messages that were different from the market's preferences, sales increased. This finding is consistent with experiments showing that a new message for a familiar brand increases brand interest, message elaboration and persuasion, even though consumers tend to resist new information (Lange and Dahlén 2003). An illustration of this phenomenon is the MetLife advertising campaign featuring PEANUTS characters. The campaign was launched in 1985 and used until 1999, when they switched to, "Have you met life today?" This – and later advertising changes were attempts to rejuvenate the brand in a mature category (Croch 1999).

Coming back to the competing theory perspectives, our results shed new light on the academic dilemma regarding temporal and market consistency. First, we found support for both perspectives as reflected by the main effects for both temporal and market consistency. Temporal consistency had a large and significant effect on sales – the more consistent the messages that were used in a brand's advertising over the previous twelve months, the better the brand performed. An information economics perspective would argue that the temporal consistency of advertising messages increases the clarity of the brand's advertising signals by reinforcing key attributes and benefits that matter to target consumers (Erdem and Swait 1998; Swait and Erdem 2004). Brands establish unambiguous meanings through a unique selling proposition that is simple, based on consumer needs, and consistently reinforced over a long period (Keller 1993; Keller, Sternthal, and Tybout 2002).

Yet we also found evidence that market consistency had a significant and large effect on brand sales. The hedonic regression results clearly indicate that consumers' willingness to pay

for the four dimensions of quality (i.e., cost of ownership, safety, performance, and comfort) changed dramatically over the period we studied. Brands that recognized this dynamism and were responsive in adapting their advertising messages to reflect changing consumer preferences increased brand sales. This result suggests that firms must continually monitor consumer preferences and update their advertising messaging to reflect changes that occur.

Managerial Requirements and Implications

Our research illustrates the importance of time-based marketing strategies, the success of which depends on the ability of marketing managers to anticipate and respond to market changes. Marketing managers require two types of information to implement the strategies we identified as most effective in our research. First, managers must be able to predict when their brands are becoming mature. In our studied market of minivans, temporal consistency, by itself, no longer drove performance after 6 years. This period may differ in markets; previous studies suggest brands are mature when new advertising message do not elicit confusion, but an increase in brand interest and memorability (Lange and Dahlén 2003). Thus, we recommend testing different advertising messages (in experiments and focus groups) to check for these signs. Second, marketing managers must accurately predict the market's willingness to pay for product benefits over time. We have introduced a dynamic, but ultimately retrospective approach to understanding market preference changes using hedonic regression. However, effective brand management requires managers to make predictions in real time in dynamic and competitive contexts. In their recent paper, Pauwels and D'Aveni (2014) combined strategy and marketing insights to study the dynamics of price-quality trade-offs and provide specific predictions and examples of the drivers of these changes.

Of course, creating effective market research structures and processes is only the first step because managers must ensure that their organizations are willing and able to respond to changing conditions. The presence of a Chief Marketing Officer (CMO), for example, is critical to this responsiveness and ultimately to firm performance (Germann, Ebbes, and Grewal 2015). More broadly, being responsive to changing market conditions depends on a culture that leads to the coordinated involvement of R&D, production, logistics, accounting, and other departments in meeting consumer needs (Kohli and Jaworski 1990). To do so, marketing managers must be able to estimate the financial returns associated with their strategies (Rust, Lemon, and Dickson 2002).

In terms of strategies, our research indicates that the managers of young brands benefit from being consistent even when they are in a secondary or less desirable position than their competitors. Of course, it is even better to identify and situate young brands in the best possible position as early as possible in their lives. They have most options available for such position if they are the innovator or early mover in a category. In their seminal study, Carpenter and Nakamoto (1994) offer evidence that consumers learn what is most important in a new category from the characteristics of the first entrant. In the U.S. minivan market, the most dominant early entrant is the Dodge Caravan and its automotive twin the Chrysler Minivan. It seems clear that the innovative Dodge Caravan invented the minivan category and became the category prototype. Our research indicates that Dodge was successful, in part, because they remained consistent with their initial comfort positioning with a focus on benefits related to ease of entry and exit, the greater interior room afforded by front wheel drive and low ride height, and car-like size and handling. These attributes defined the minivan category and consumers learned what was important to look for in the category from Dodge's innovation. Our results therefore

reinforce the desirability of innovation but also the need for managers of young brands to remain with their position as long as possible to maximize the benefits that accrue from consumer learning.

After their brands have matured, and thus have become well known to consumers, managers can now contemplate changing strategies. For instance, both Plymouth Voyager and Dodge Caravan maintained high market shares by changing their positioning over time. Such brand revitalization success reflects experimental evidence that a new message for a familiar brand increases brand interest, message elaboration and persuasion. On the other hand, our results also show success for mature brands that stick to their positioning. In our dataset, Ford Aerostar and Nissan Quest combine a high temporal consistency with a rather low market consistency. Likewise, Coca-Cola has been consistently advertising on bringing happiness, leveraging the remaining caffeine when it removed cocaine in the early 20th century (Boatwright and Cagan 2010). Other examples include Apple and Harley-Davidson, with temporally consistent positioning typically based on emotions (ibid).

Limitations and Directions for Future Research

Every study has its limitations, and our longitudinal field design is no exception. Although we have controlled for more than a dozen potential predictors of sales, it is possible that other confounding factors exist. Moreover, our field study design is correlational rather than causal, though we use four independent data sources that are not affected by common method variance. These limitations must be balanced against the advantages of tracking consumer behavior in the form of sales, and accounting for the actual strategies used within the category over an extended period of time. We encourage further research in the laboratory to further

assess the validity of the results we report, and to assess clarity as it relates to how consumers process advertising information.

Given time and budget constraints we were only able to include print advertisements, which are a substantial proportion of the advertising budget (approximately 40%) within the automotive category we studied. Despite the emphasis on integrated marketing communications strategies it is possible that print advertisements are not fully representative of the brand's overall advertising strategy. Although we have no reason to believe that our findings do not apply to other media, we encourage future research to test our results within and across other media.

The nature of our design precludes the collection of individual-level or consumer-segment level data. We were not able to actually assess the degree to which temporally consistent messages actually resulted in clarity. Nevertheless, we rely on strong theory from a variety of literatures to develop our hypotheses, and our approach is consistent with a growing body of research that relies on individual-level theory to predict aggregate market behavior (Chandy et al. 2001; Fisher, Vandenbosch, and Antia 2008; MacInnis, Rao, and Weiss 2002). It would be highly beneficial to test our model in a laboratory setting, though it is important to test the hypothesized effects in the field (Wells 1993).

A final limitation is that our research does not track the long-term effects of inconsistencies in advertising messages on brand health because our focus is on monthly sales. It is unclear, therefore, whether the short-term benefits of brand sales we found for market consistency ultimately have a negative effect on brand equity. Many of the arguments in support of temporal consistency do so because of the fear that changing or expanding brand meanings introduces complexity and confusion, which trades off short-term sales for long-term brand health.

APPENDIX

HEDONIC REGRESSION OF CONSUMERS' WILLINGNESS-TO-PAY

To reveal changes in consumer willingness-to-pay (Edmonds 1984; Murray and Sarantis 1999), we take a comparative statics view in estimating the hedonic regression equation for distinct time intervals over the life cycle of the minivan category (Pauwels and D'Aveni 2014). The length of each interval reflects our trade-off between timely identification of changing customer valuations and the need for each interval to contain a sufficient number of observations. Biennial time intervals yielded at least 14 observations (i.e. twice the number of coefficients to be estimated) per period between 1990 and 2003. In the early years of the minivan industry (1983-1989), however, there were few US minivans and even fewer imported minivans. As a result, we omitted the data from the 1983-1989 time period. In total, we thus obtain 7 observation periods and an estimation sample of 97 product observations.

Table 3 displays the parameter estimates from the hedonic regressions, with significant effects ($p < .10$) indicated in bold. Each regression passes the F-test of significant explanatory power at the .05 significance level. Moreover, the price variation explained is more than half; varying from 61% in the early period (1992-1993) to 93% in the 1996-1997 period. In each time period, at least one of the quality factors has a significant effect on price. Because our key objective is not to test coefficient significance in any given time window, but to study evolution in customer valuations over time, we retain all estimates irrespective of their statistical significance (Cox 2010).

The hedonic regression results indicate that consumers' willingness to pay for each dimension of quality is highly variable over time. We observe that comfort and cost, and to a lesser extent performance, are highly valued attributes early in the product life cycle, but also

that consumers' willingness to pay for all of the quality dimensions declined and became roughly equivalent as the category reached maturity. The decline in the willingness to pay is plausibly due to competitive innovations and improvements on key quality dimensions, which turned points of difference into points of parity (Keller 2012). Improvements in performance, comfort, safety, and lower cost of ownership benefited consumers, but the longitudinal hedonic regression results indicate that consumers perceived fewer meaningful differences between brands as the category matured, which lowered their willingness to pay for the four dimensions of quality.

As our focus is the *relative* consumer preference for each of the 4 quality dimensions, we standardize consumers' willingness to pay for each quality dimension (WTP_j) by the total consumer willingness to pay (TWTP) for all four dimensions, so as to obtain consumers' relative willingness to pay for each of the four dimensions ($RWTP_j = WTP_j / TWTP$). Figure 2 shows how this relative willingness to pay evolves over time.

At the start of the minivan category, consumers were mostly willing to pay for comfort, which included a low ride height that made it easy to enter and exit, a convenient sliding door on the passenger side, and their small size that made them easy to park. Next, the importance of cost of ownership appears to reflect recessions, both in the early 1990s and in the early 2000s. Third, consumers were most willing to pay for Safety¹⁰ in the mid-1990s and 2000s. Finally, performance became the quality dimension with highest relative willingness to pay in the late 1990s.

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¹⁰ Importantly, the relatively low willingness to pay does not mean that safety is unimportant to consumers – indeed a primary target market for minivans is parents who are transporting their children. Instead the low willingness to pay plausibly reflects that consumers perceive little difference *among the minivan brands* on the safety dimension.

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TABLE 1
SAMPLE DESCRIPTIVE STATISTICS

Brand	Year of Introduction	Year of Termination	Mean Market Share (%)	Mean Market Consistency	Mean Temporal Consistency	Mean Annual Changes to Ad Execution
Chrysler Town & Country	1989	Ongoing	5.40	-0.63	-0.24	3.12
Dodge Caravan	1983	Ongoing	23.88	-0.57	-0.26	5.76
Plymouth Voyager	1982	2003	18.95	-0.57	-0.25	4.38
Ford Aerostar	1985	1998	15.72	-0.57	-0.08	1.15
Ford Freestar	2003	2006	6.04	-0.86	0	2.00
Ford Windstar	1994	2003	15.03	-0.63	-0.14	1.44
Mercury Monterey	2003	2007	0.85	-0.54	0	0.00
Mercury Villager	1992	2002	4.01	-0.49	-0.09	1.42
Chevy Astro	1984	2005	12.01	-0.53	-0.14	1.43
Chevy Lumina	1989	1998	3.73	-0.43	-0.08	0.91
Chevy Venture	1996	2005	7.37	-0.69	-0.23	3.31
GMC Safari	1984	2005	3.29	-0.63	-0.02	0.02
Oldsmobile Silhouette	1989	2004	2.00	-0.59	-0.05	0.55
Pontiac Montana	1998	2009	4.13	-0.64	-0.10	0.00
Pontiac Trans Sport	1989	2000	2.45	-0.50	-0.05	0.72
Honda Odyssey	1994	Ongoing	6.92	-0.69	-0.16	1.37
Kia Sedona	2001	Ongoing	3.68	-0.24	-0.08	1.71
Mazda MPV	1988	2006	2.68	-0.58	-0.04	0.51
Nissan Quest	1992	Ongoing	3.15	-0.65	-0.07	0.78
Toyota Previa	1990	2000	2.38	-0.55	-0.28	2.99
Toyota Sienna	1997	Ongoing	7.70	-0.83	-0.40	3.37

TABLE 2

HEDONIC REGRESSION ESTIMATION SAMPLE DESCRIPTIVE STATISTICS

Variable	Mean	Std. Dev.	Min	Max
Cost of ownership	- 0.03	1.56	- 3.75	3.44
Performance	- 0.03	1.41	- 2.41	3.72
Comfort	- 0.05	1.13	- 2.96	3.95
Safety	- 0.01	1.36	- 3.36	2.85

TABLE 3
HEDONIC REGRESSION ESTIMATION RESULTS

<i>Period</i>	<i>90-91</i>	<i>92-93</i>	<i>94-95</i>	<i>96-97</i>	<i>98-99</i>	<i>00-01</i>	<i>02-03</i>
<i>COST</i>	6931	7831	642	664	513	534	931
<i>SAF</i>	142	357	996	877	95	168	740
<i>PERFOR</i>	2748	1431	659	369	1662	497	418
<i>COMFY</i>	8199	3713	3128	2470	487	308	306
<i>IMPORT</i>	-32783	-17347	221	2443	-2044	1095	1646
<i>ANNUALAD</i>	0.06	0.90	0.06	0.00	0.04	0.05	0.04
<i>Intercept</i>	32135	18355	27096	25328	24765	21941	21502
<i>R-squared</i>	0.90	0.61	0.74	0.93	0.66	0.63	0.81

Bold text indicates statistically significant coefficients ($p < .10$).

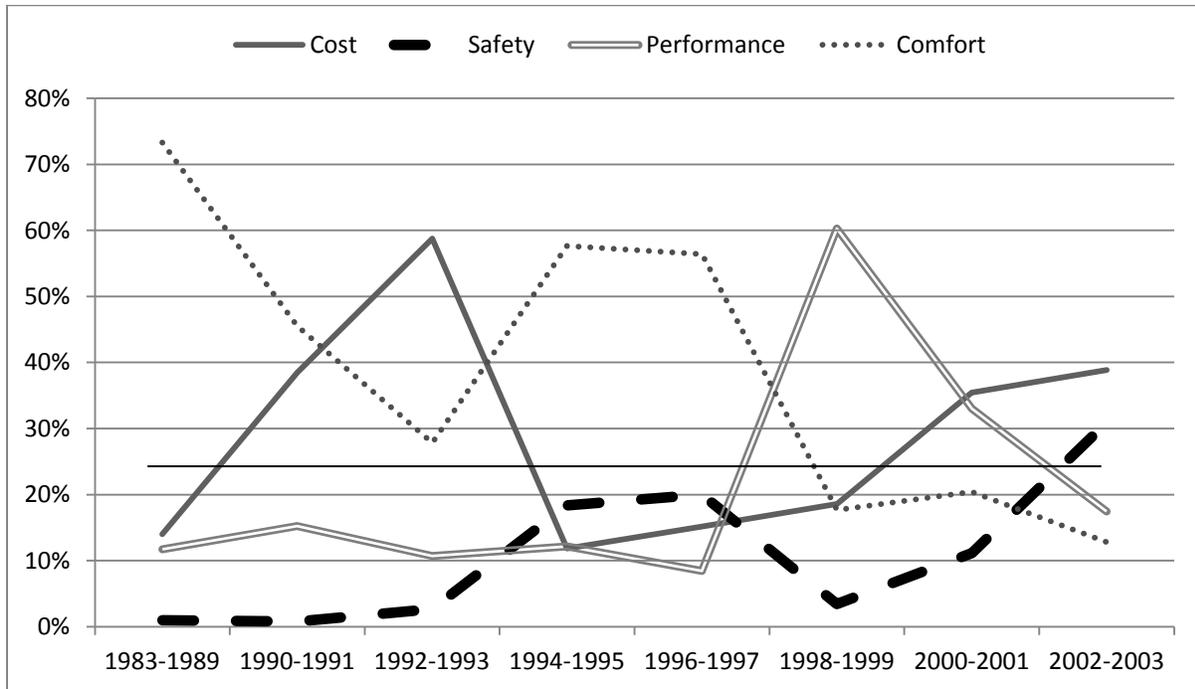
TABLE 4
HAUSMAN-TAYLOR REGRESSION ESTIMATES

Predictor Variables	Parameter Estimates	Standard Error
Constant (α)	-268.18	3198.94
MSRPrice of the brand (β_1)	-0.40 ^{***}	0.04
Advertising Intensity (β_2)	0.09 ^{***}	0.02
Number of distributors (β_3)	1.30 [*]	0.64
Import status of brand (β_4)	2675.18	2718.85
Number of new ad executions in the year (β_5)	44.46 [*]	21.27
Quality (β_6)	193.59 ^{**}	74.50
Category Sales (β_7)	0.05 ^{***}	0.01
Category Age at Brand Introduction (β_8)	2.78	15.51
National level promotions (PROMO) (β_9) (in \$)	1.15 ^{**}	0.35
Temporal Consistency (TC) (β_{10})	1685.51 [*]	791.13
TC * Brand Age (β_{11})	-26.92 ^{***}	7.58
Market Consistency (MC) (β_{12})	1239.13 ^{**}	445.74
MC * Brand Age (β_{13})	-18.96 ^{***}	4.61
MC * TC (β_{14})	1318.56	969.54
MC * TC * Brand Age (β_{15})	-30.41 ^{**}	10.54
Brand Age (β_{16})	20.34 ^{***}	4.89
Brand Age ² (β_{17})	-0.12 ^{***}	0.02
Lagged Sale (β_{18})	0.59 ^{***}	0.02

Significance at the .05 (*), .01 (**), and .001 (***) level

FIGURE 1

CONSUMERS' RELATIVE WILLINGNESS¹¹ TO PAY FOR QUALITY DIMENSIONS OVER TIME (SOLID LINE REPRESENTS PROPORTIONAL IMPORTANCE OF 25%)



¹¹ As detailed in the appendix, willingness to pay for each attribute is assessed by regressing each product's price on its attributes, thus revealing how much money each attribute fetches in the market.

FIGURE 2A

EFFECTS OF TEMPORAL AND MARKET CONSISTENCY ON SALES: YOUNG BRAND

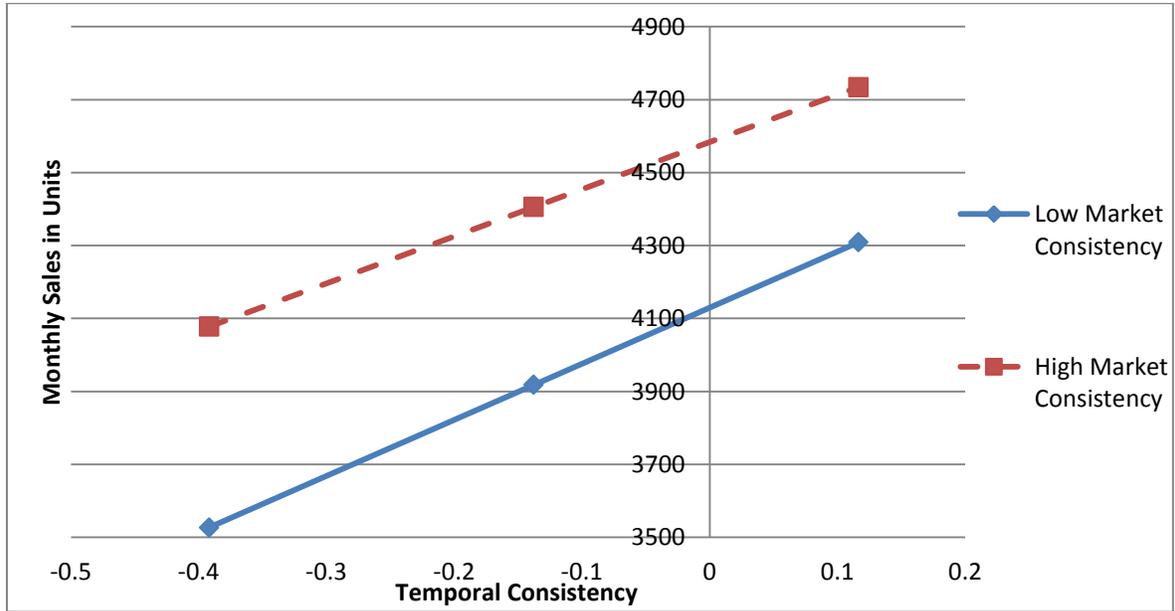


FIGURE 2B

EFFECTS OF TEMPORAL AND MARKET CONSISTENCY ON SALES: MATURE BRAND

