Capstone Case

Grosse Pointe Associates and the "Microvan"

The case describes a project by Grosse Pointe Associates (GPA) investigating the potential market for "microvans". The project starts with focus groups, which demonstrated interest and generated a list of desirable attributes for the microvan. GPA then tested the microvan concept with 30 questions included its in-house panel. A small separate test panel was conducted prior to the full panel survey.

The objectives of this case are:

1. To give you experience segmenting customers in a market
2. To have you determine which segment(s) would be good to target based on analysis of the data.
3. To have you relate the segment(s) to demographic variables potentially useful for targeting

This is a "capstone" case that melds many multivariate techniques (e.g. regression, factor analysis, cluster analysis) in a decision-oriented setting. The survey data needed for the analysis are available as a separate file.

Background:

The U.S. auto industry is always looking ahead to the next big trend in automotive design. Lead times are lengthy – several years from concept to prototype and several more to the dealer floor – with total costs for a new model line often topping $1 billion. The main method for detecting such trends is primary consumer research, typically starting with targeted focus groups and proceeding to medium- and eventually large-scale surveys. These surveys serve at least two purposes: (1) to verify the "wants and needs" of a particular consumer group/niche, and (2) to then overlay purchase intent, sometimes along with other demographic or profit-based data.

Grosse Pointe Associates (GPA) is a boutique consulting firm located in Dearborn, Michigan. GPA chose its location for the proximity to major automotive company headquarters and its name because it called to mind upscale Grosse Pointe, an affluent suburb of Detroit and home to many industry executives. GPA's core business is dedicated to sleuthing out auto industry trends and then conducting exploratory marketing research to understand what is behind them. Although not exclusively an automotive consulting or market research shop, more than 70 percent of their annual revenue is generated from the auto industry.

Based on their ongoing biannual consumer panel surveys, GPA noted an intriguing trend: affluent couples with children (typically, between one and three children) were indicating increased purchase intent for minivans. The traditional profile of minivan users encompassed a relatively undifferentiated market, middle

to upper-middle-class families usually with multiple young children in the household. Although GPA was not yet sure whether they had detected a statistical blip, a fad, or something more enduring, their data seemed to suggest that there was a luxury-oriented niche market of smaller families that still wanted the "kids and their friends" orientation of traditional minivans but with tighter size dimensions. Indeed, when asked about minivans currently on the market and why they had not purchased one, some of their panel respondents commented explicitly about not wanting a "tank" or a "boat".

GPA executives were not only seasoned market researchers; they also had extensive experience with the automotive market and manufacturers. A friendly debate emerged as to what was "driving" the preferences for this potential new subcategory. Everyone agreed that smaller families among the educated and relatively affluent were a trend validated by detailed government census data. Were emerging preferences arising from a desire to have their own version of the minivan (similar to those who wanted a small SUV)? Or were they perhaps spurred by the environmental movement, which sensitized consumers to excess and waste and produced blockbuster models like the Toyota Prius? It was likely a combination of these factors, with different families having distinct preferences for different minivan "attributes".

GPA stated looking at precedents in the industry and quickly latched onto the "microvan". These were closely related to "K-cars", which had some popularity in Japan. Also called "Kei cars" and "keijidōsha", these are literally "light automobiles" and comprise an entire line of different car types – sedans, (micro)vans, and even light trucks – with the distinguishing feature that they were all diminutive, a major selling point in the Japanese market. The Kei cars emerged in Japan to skirt laws requiring vehicle owners to demonstrate that adequate parking is available, but they became popular as less-costly alternatives to their full-sized cousins as Japan rapidly urbanized in the 1960s and the ensuing decades. Some of the biggest players among Japanese manufacturers produce K-cars, including Honda, Mitsubishi, Nissan, and Subaru, though none had made an especial attempt to crack the US market which was perceived as not wanting to compromise on performance or size.

GPA ran a number of focus groups among potential buyers of such cars. These included heads-of-household in affluent, smaller families as well as those outside the supposed target group, for instance city dwellers pressed for parking space and small business owners needing an economical way to make one-off deliveries. The focus group results were encouraging: many respondents were excited by the prospect, which was described as a potential "concept car" with specific attributes likely to wind up in the first US microvans. But they also turned up a variety of concerns about power, acceleration, durability, space, novelty, reliability, etc., along with a "wish list" of capabilities and accessories that might tax engineers' ingenuity. The upside was that these groups not only indicated strong purchase interest but also a willingness to pay a premium over comparable vehicles currently on the market, such as smaller pickups, SUVs, or standard minivans, the last of which were often seen as too bulky and, notably, as conveying the "wrong image".

Given these encouraging results, GPA decided to enlist its in-house panel to test the "microvan" concept more rigorously. Their panel consisted of a large cross-section of the general US adult population with different stages of "lifestyle" and "buyer readiness". Because many demographic variables (age, income, education, etc.) were already available for household members, these would not need to be collected afresh. One of the felicities of using a panel is that a small or moderate number of questions could be added to their biannual online survey without the need for a special email drive; it also avoided calling particular attention to the topic of study, which could cause "yea-saying" (i.e., people will say they like something if asked only about that thing). GPA's surveys usually contained 150-200 total questions, and panelists agreed to respond completely within 7 days of receipt. Results were compared when possible to known distributions from the

US Census to ensure that respondent households were broadly representative of the population of potential auto buyers.

GPA looked over a lengthy list of potential "attributes" that could be important to prospective microvan purchasers as well as lifestyle statements (e.g., psychographics) validated by their extensive past research in the auto industry. Based on detailed notes taken during the focus group phase, they settled on a set of 30 attributes that seemed to capture the nature of the discussion as well as on important psychographic variables. Their goal was to use these attributes to capture the key dimensions that were important to potential buyers, and to identify segments that auto companies could target [These 30 questions appear, verbatim, at the end of the case text.]. GPA also decided to include one additional question about the overall attractiveness of the product concept; this seemed more appropriate than asking about "purchase likelihood," which could be confounded with many other variables, like whether one was in the market for a new vehicle at all or the ability to achieve financing during tough economic times.

After running a small pre-test on a separate panel to work out any kinks in the question wording, GPA unleashed their full panel survey. Within a week, they had many thousands of responses. Some of these were from demographic groups unrelated to the target markets clearly identified by the focus groups, and others were in a state of low purchase readiness (that is, they either had recently purchased a vehicle or explicitly expressed that they were not looking). Careful screening allowed GPA to identify households from appropriate target markets who indicated a non-zero likelihood of purchasing a new car in the next year. Data on a random sample of 400 of these respondents is included here for the purposes of analysis, along with seven additional demographic and behavior based questions, as listed at the end of this case (specifically: the respondent's age, household income, gender, number of children, educational level, miles driven per year, and self-reported recycling activity).

GPA's management was aiming for massive data reduction but also for something more important: increased understanding and communicability of the survey results. They started with 400 responses on 30 attribute questions each on a 1-9 Likert scale (12,000 pieces of data in all) and were hoping to compress them into a much smaller number of factors and clusters. For example, using (say) 6 factors and 4 clusters means representing the 12,000 pieces of data with just 24 numbers, a 500-fold reduction. But this would be pointless if the representation discarded vital features of the data or helped explain the "concept liking" variable dramatically less well.

Questions and codes used in panel survey

v01	**kidtrans**	We need a car that helps transport our kids and their friends.
v02	**miniboxy**	Current minivans are simply too boxy and large.
v03	**lthrbetr**	Leather seats are dramatically better than cloth.
v04	**secbiggr**	If we got a second car, it would need to be bigger than a standard sedan.
v05	**safeimpt**	Auto safety is very important to me.
v06	**buyhghnd**	We tend to buy higher-end cars.
v07	**pricqual**	Car prices strongly reflect underlying production quality.
v08	**prmsound**	A premium sound and entertainment system helps on long car trips.

v09 **perfimpt** Performance is very important in a car.
v10 **tkvacatn** We try to take as many vacations as possible.
v11 **noparkrm** Our current residence doesn't have a lot of parking room.
v12 **homlrgst** Our home is among the largest in the neighborhood.
v13 **envrminr** The environmental impact of automobiles is relatively minor.
v14 **needbetw** There needs to be something between a sedan and a minivan.
v15 **suvcmpct** I like SUVs more than minivans since they're more compact.
v16 **next2str** My next car will be a two-seater.
v17 **carefmny** We are careful with money.
v18 **shdcarpl** I think everyone should carpool or take public transportation.
v19 **imprtapp** Most of our appliances are imported.
v20 **lk4whldr** Four-wheel drive is a very attractive option.
v21 **kidsbulk** Our kids tend to take a lot of bulky items and toys with them.
v22 **wntguzlr** I will buy what I want even if it is a “gas guzzler”.
v23 **nordtrps** We don’t go on road trips with the family.
v24 **stylclth** We tend to purchase stylish clothes for the family.
v25 **strngwrn** Warranty protection needs to be strong on a new car.
v26 **passnimp** Passion for one’s job is more important than pay.
v27 **twoincom** Our family would find it hard to subsist on just one income.
v28 **nohummer** I am not interested in owning a vehicle like a Hummer.
v29 **aftrschl** We engage in more after-school activities than most families.
v30 **accesfun** Accessories really make a car more fun to drive.

age Age of respondent in years
income Annual household income in thousands of dollars
miles Total annual amount driven by household members in thousands of miles
numkids Number of children (aged 0-18) residing in household
female Whether or not the respondent is a female
educ Education level of respondent (1 = High School, 2 = Some College, 3 = Undergraduate Degree, 4 = Graduate Degree)
recycle Self-reported recycling compared to average (1 = Much Less, 2 = Somewhat Less, 3 = Average, 4 = Somewhat More, 5 = Much More)