

Data Analysis

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What is market structure analysis? We start with perhaps the most obvious opening question of any article that you will read this year or next. We also begin our answer with an enthusiastic statement: "Unfortunately, no clear definition exists." Now, let's see what we can do about this.

Many of us have remained blissfully ignorant of this, but there is nonetheless a large literature on market structure analysis. (A sampling of just some of the articles is cited at the end.) Careful review of these leads to two basic conclusions:

- Numerous approaches to market structure analysis have been proposed in a very large number of scholarly works, with no approach seeming predominant.
- Plowing through all these articles requires frequent naps.

Some of the confusion surrounding this topic arises from the fact that two contrasting traditions have embraced it—namely, marketing and economics. As you might expect, the basic approaches are different. (Perhaps more surprisingly, some of the marketing papers are even harder to read than the ones from some economists. So we can see that, over the years, marketing at least has gained in the area of obscurity.)

Comparing and contrasting: marketing vs. economic methods

We will briefly review both methods, point out some very large differences and commonalities, and then discuss the marketing approach.

Marketing approaches mostly include these basic elements:

- some means to analyze the struct-

ture of relationships among competing companies;

- Some other means to analyze the structure of relationships among competing brands.

Typically these studies include several areas of focus, whether primarily geared toward looking at competitive entities or brands. They often will investigate how brands are used, and the relationships of usage patterns among brands. They often look at the relationships in ways that brands are perceived. It is fairly common for studies of market structures to include just these topics.

Price elasticities and “cross-price elasticities” are other important market structures, however, even though they are not often mentioned in this way. There are other, more specialized views of what belongs in a market structure analysis. Trying to summarize these, things can get complicated. We will pass on tackling many of the more specialized definitions, then, and hope that you can tolerate the disappointment this causes.

Market segments usually are not considered market structures. This is one of the less intuitively appealing aspects of most definitions. Segments and structures can have some fairly complicated relationships, and we indeed will discuss later.

Now let’s take a very brief view of **economic approaches**. The list of topics that these cover is broad and, as mentioned, somewhat different from those covered by the marketing approaches. Aspects of markets that seem to have received the most attention from the economists include:

- Numbers of buyers and sellers,
- Extent of to which products are substitutable,
- Analysis of comparative costs,
- Ease of entry and exit for competitors,
- Extent of “mutual interdependence” or (as they seem to mean) the extent to which buyers and sellers must depend on each other.

The concepts here may appear somewhat rudimentary, and lacking in appreciation of consumer psychology. One important point that the economists have in common with marketers is that they include “demand elasticities” and “cross-demand elasticities” (or words meaning the same thing) in market structures. How economists get to their answers may be very different from marketing practices, though.

Indeed, economists can do much of their work without ever talking to an actual person. Some even act as if asking people what they do or think is superfluous to understanding what is happening in a marketplace. This may seem slightly ridiculous, but we should remember that these fellows win Nobel prizes while humble marketers and market researchers do not. Perhaps they are on to something.

The secret of their success may lie in the mathematics they use. This can range from the highly sophisticated to the truly hair-raising. Indeed, as long as people are ancillary to the equations, the concepts can get highly elaborate. You are invited to draw your own conclusions about that.

Back to the Marketing Approach: A Path for Getting to Market Structures

Let’s start with something that may seem self-evident, but which we still need to think about carefully. The basic consideration for all marketing analyses is reaching a definition of exactly what constitutes the market. (We did warn you that this sounds foolish. Still, just reaching a definition can be quite a difficult.)

The hardest part of setting this definition is that you need to set some limits on the “competitive set” of products.

Looking at just one example, let’s consider the market for diabetes care products. Most authorities say that there are two basic types of diabetics: Type I (sometimes called “juvenile,”) and Type II (sometimes called “adult onset.”) Type I diabetics always need insulin injections to live—their bodies typically produce none that they can use. Type II diabetics usually produce some insulin, and so often only require medications that help them use their insulin more effectively. (Also, exercise and healthier eating habits help too, as does keeping one’s weight down to a reasonable level.) However, some Type II diabetics require insulin, and now many type I diabetics are taking medications that help them use insulin better along with their insulin. This has led some authorities to say that what we really need to look at is whether a diabetic is taking insulin or not—never mind the traditional medical division of diabetes into two types. Also, there are some new medications coming out that are aimed at treating “pre-diabetic” conditions—or to prevent the disease from taking hold.

Looking at all this, how do you define the “structure” of the marketplace? Which products are competing with each other, and how? Do you include the new pre-diabetic products in your analysis? How do you divide the universe of diabetic people? Where does exercise and diet figure in all this? Do they compete with products in the marketplace? If so, how? We can continue asking questions like this until everybody is quite tired.

Some method for setting limits on the market must be chosen, then. Traditionally, this was done by focusing on one these factors:

How much products can substitute for each other, based on consumer perceptions;

Extent to which products are intended to serve similar purposes;

Actual impact of products on each other, as measured by “elasticity of demand” and effects of products on each other, or “cross-elasticity.”

Note that the “impact” products have on each other and degree to which they can be substituted are highly similar ideas. The key point underlying this distinction, it seems, is that “impact” can be measured without considering perceptions at all. Therefore, different types of studies could be the focus of each of these “options.”

For instance, “elasticity of demand,” and related ideas, bring to mind—for some of us, anyhow—choice-based modeling, or perhaps conjoint. (Whichever one, the same constraints hold, so we will discuss choice-based studies here.) In choice-based studies, we typically look at what people select in some set of competitive marketplaces. The focus here is on what people do, and not on their explanations of why they do it. If perceptions are addressed at all in a choice-based study, they are not part of the choosing that study participants do. What we learn comes from measuring study participants’ choices among the differing product configurations that they see in the interview—and applying this to many alternative product configurations not tested.

Similarly, studies that focus on perceptions and opinions rarely have a choice-based exercise in them. Some of the reasons for separating these types of studies are very practical. For instance, most study participants are nearly worn out after they finish a typical choice-based exercise. Since most of us want to know everything about everything when

we do a study (of course), the lucky respondent may get to make choices in up to 21 “market scenarios” in a choice study. (The general rule here is that the more factors we want to analyze in a choice study, the more marketplaces we need to show to get the required information.) In any event, choice-based studies usually run to the known limits of a human being’s ability to do a good job in the interview.

Most of us are likely are more familiar with studies of attitudes and opinions. Therefore, we know that by the time everybody involved has added his or her pet question(s), these get to be real monsters also. Asking a person to do *one of these* and—at the same time—*one of those* (a choice-based model or full-blown conjoint task) is just too much. We need to decide which we want—or if we want both, whether we can afford to interview two sets of people.

One Key Unresolved Issue in Defining Markets

One key issue remains largely unresolved if we start our definitions of markets by looking at “substitutability” or “market impact.” That is, neither does particularly well in studying some types of competitive behavior. The same holds if we look just as consumers’ perceptions. Of course, a set of “remedies” has been proposed for largely self-imposed problem. These sometimes go under the heading of “hybrid forms” of structure analysis.

Hybrid methods combine behavior-based and judgment-based methods of defining markets, as well as other approaches in later stages of the analysis. (As you may have expected, we will discuss this.) In more practical terms, you might need to do all sorts of studies, such as perceptions and usage studies, and choice models, and somehow put all the information together. You might even include other topics, depending on what you need to know. Different ways of putting these approaches together almost certainly will yield different ideas about market structures. Hybrid approaches underscore the notion that the search for a “true” market structure is one of those great and endless quests. No one answer about what is “true” exists here, just as is the case in the rest of life.

Getting to Overall Market Structures

In marketing approaches, we almost always start with people—or as we like

to call them, consumers. To reach an overall market structure, “individual consumer market structures” need to be aggregated. Individual structures are simply each consumer’s behaviors and/or perceptions about key marketing variable(s). If you have kept your eyes open most of the time, so far, you will not be surprised to learn that two main aggregation methods are used:

- Behavioral aggregation (linked to studying market impact);
- Subjective aggregation (linked to extent to which products can substitute for each other, ratings, opinions, and perceptions).

Aggregation is problematic. One main question that gets asked—in some quarters, at least—has to do with what happens when we “roll up” a lot of idiosyncratic opinions. That is, how do we meaningfully aggregate individual consumer choices or opinions, when these often reflect great diversity?

An aggregate market structure that we choose may NOT represent any individual’s structures well. In fact, any overall market structure gives only an average view of consumer diversity. We have numerous pundits to remind us that these averages can hide information, and may even be misleading.

In fact, this is one of the “charges” leveled against choice-based modeling as it has been traditionally done, at the aggregate (or group) level. Unless you really torture the data from a choice-based model, you never learn anything about what individuals are doing. (The torture method of choice today is something called Hierarchical Bayesian analysis, and generally requires squeezing the numbers for days—or “just hours” for a simpler problem, as some put it—even with the latest monster Pentium IV. But Hierarchical Bayesian analysis is another story.) The point of this is that some experts will go to great lengths to alleviate their discomfort in looking at aggregate (or group) level data.

However, these complaints about looking at groups may not be that well founded. These are some reasons. (Just remember that you read this here first.) We almost never look at a market solely in its entirety—that is, without having some groups in mind. For instance, if our goal is to study the market for (say) diet colas, we almost certainly will not interview everybody who walks into a supermarket. This might be fun, and if not, certainly very expensive, but no-

body outside the further reaches of academia is likely to find this useful.

The Secret About Whole Marketplaces vs. Study of Important Groups

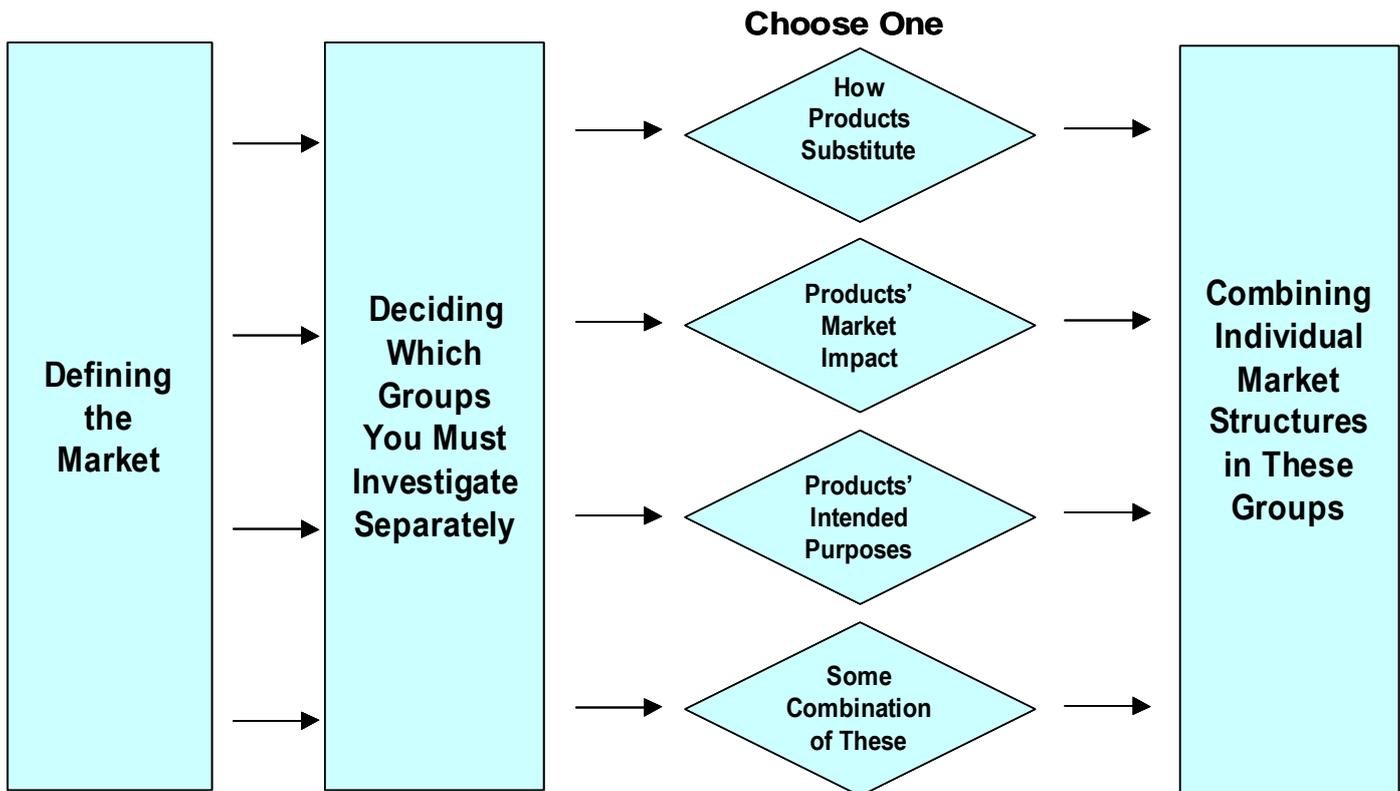
Rather, a useful study would focus on groups of users, such as heavy vs moderate vs light users—or on brand-loyal users vs frequent switchers. Then we would observe any market structures within each group. If we have defined the groups properly, the question of “diversity” becomes less important. That is, heavy users are typically defined along these lines: “the 20% of users who consume 80% of our wonderful product.” If heavy users are diverse, it may be nice to know this, but knowing may not help encourage them to use more of our great stuff, or even how to keep them from using less. In this case, the diversity of the group just is part of the way the world runs.

Some of you may then say something like this: “But what if some heavy users are more likely to become moderate users than others?” Or, as it more usually gets asked, “What if some heavy users are more *vulnerable* than others?” (This shifting of vulnerability from the product, which will suffer no recognizable losses if people decide they don’t need it, to the people themselves, is one of those wonders of modern marketing, by the way.)

One appropriate answer to a question like this is to structure the study so that it can isolate those more and less “vulnerable” among heavy users. That is, the study would find market structures among two or more types of heavy users, and not assume that they are all the same. Here we encounter some of the real complexity that can be found in market structure analysis. To do this accurately, we need to have some good ideas about the groups we are likely to find in the market. If groups are truly different, they will have different market structures. Just lumping these together will lead to gross inaccuracies.

In just a short note, practical marketing approaches move furthest away from (and perhaps beyond) economic approaches, by including the idea that you need to think about groups in the marketplace and to prepare to analyze them separately. In one way, then, the practitioners in marketing and market research routinely take a more sophisticated approach to market structures than their learned brethren.

Summary: A “Flow Chart” For This Step



Developing a Working “Picture” of the Market Structure

Once individual consumer behavior is aggregated, the next step is devising some working representation of the overall (aggregate) structures. The goal here is showing how products compete, in ways that convey research and managerial implications effectively. Following the discussion from earlier sections, market structures may never get aggregated up to the “whole market” level. The analysis may look (for instance) at heavy users, moderate users and light users separately, and go into some depth about each. It may compare and contrast groups that are important to understand. Finally, it may include some communalities, especially areas where strengths and weaknesses appear across the groups studied. It almost never would try to extract some “global view” and leave it at that.

Methods for Depicting Market Structures

We can divide approaches for representing market structures into two main classes, namely, the **spatial** and the **non-spatial**. Spatial techniques are used often with data based on judgments (opinions, perceptions, ratings). These work well with various maps, or as they are

known in formal circles, “continuous dimensional market structures.”

The simplest spatial techniques give a picture of market boundaries as separate clusters of products in two-dimensional space. Some judgment then is made about distance between clusters as determining where a market stops and starts.

Other maps are quite familiar to many of us—for instance, the type showing how products relate to ratings. This type of map often is called a “perceptual map”—as are many other types of maps, also. Not all maps that show attributes arrayed in space show market structures, though, as the figure below shows us.

The chart on the top of the next page shows one type of market structures. This map represents brands and perceptions about them. The really basic idea behind the map is: “what appears together goes together.” Attributes that fall close to a brand are strongly associated with that brand. Attributes that fall together have similarities with each other. Brand that fall closest to each other have similar patterns in ratings.

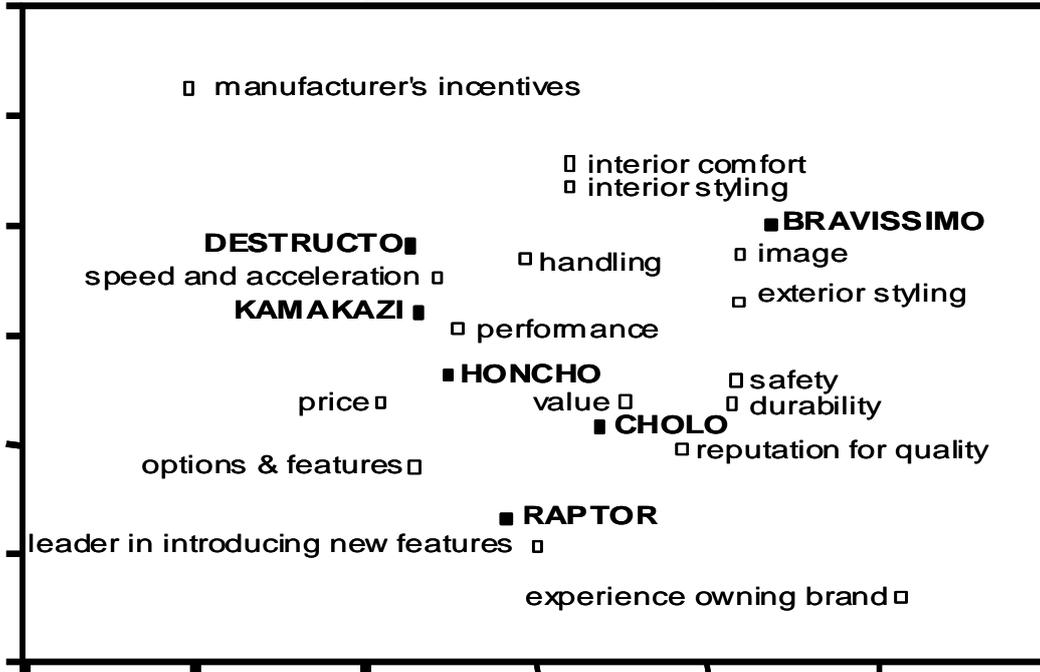
The map on the bottom shows groups in the marketplace, and possibly even market segments (if we can find them and reach them selectively in some way). Showing what is important to var-

ious groups of buyers (or even segments) typically does not count as market structure analysis—at least when we are being pure and right about things.

Sometimes, mapping—at least various maps like the one on the top—is most of what gets called market structure analysis. So if somebody who can make life difficult (e.g., a client, a boss, or a boss’s boss) asks for a market structure analysis, you do not need to panic immediately. They may just want some maps. Of course, they might even want something entirely different that is not market structure analysis at all according to the generally accepted rules. (Then you can panic.)

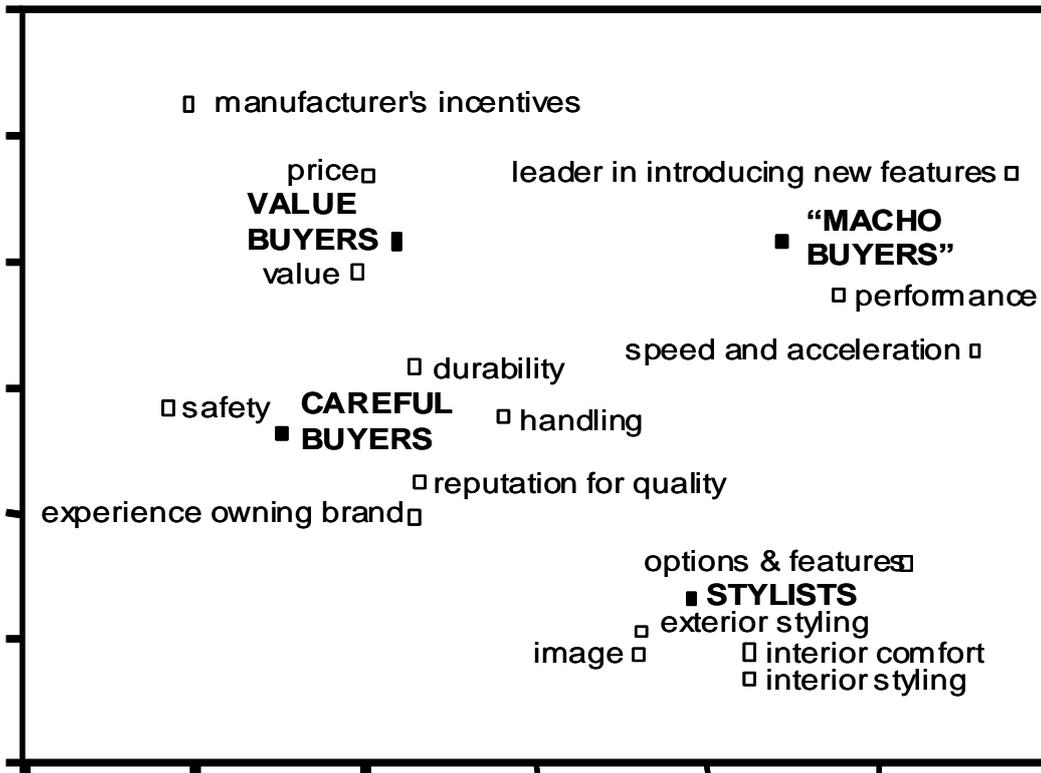
Non-spatial approaches can work well to show behavioral data, as may be readily apparent. For example, analyses of product or price “cross-elasticities” often lead to displays that are not at all like maps, such as the simulator programs that you can create based on a choice-based modeling study. Simulators can look very impressive if you have a good programmer working on them—and can do great things with “what-if” types of questions about changing product configurations. However, they have nothing faintly “map-like” about them.

Attributes associated with 4 x 4 truck brands by recent buyers
(fictional brands shown)



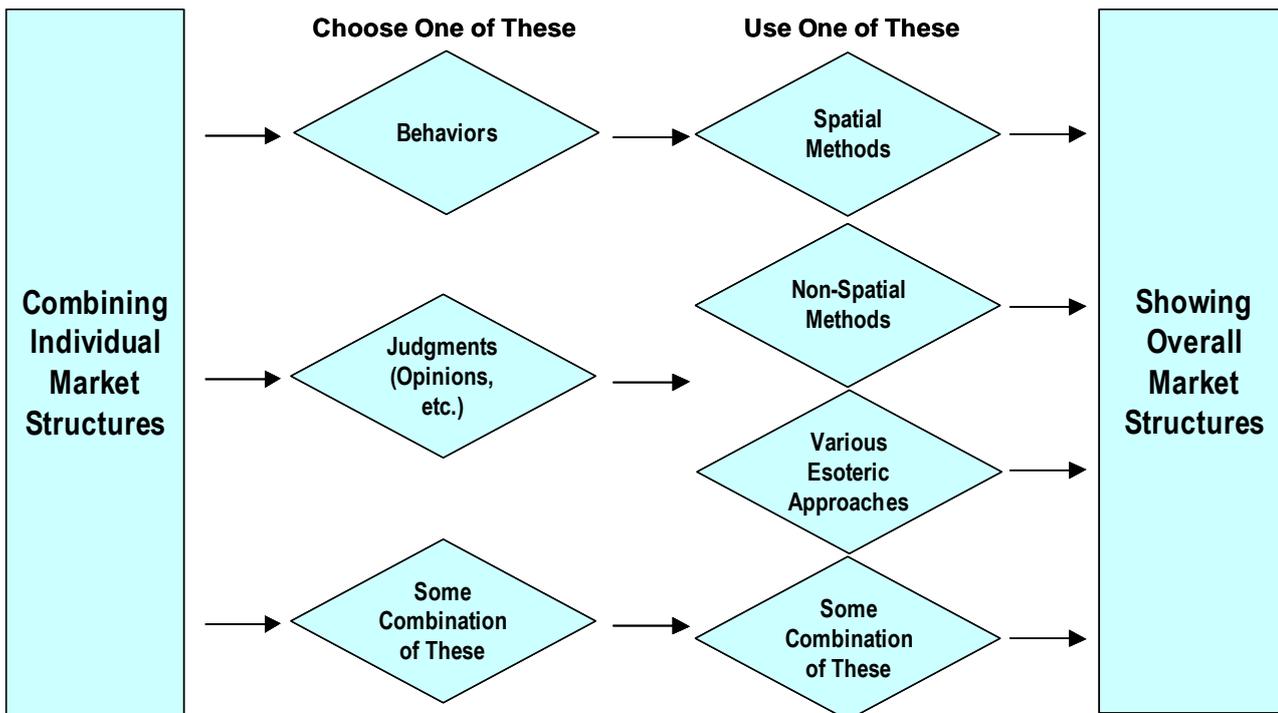
Note: Brands are closest to the attributes with which they had the strongest associations

Attributes associated with different groups buying a 4 x 4 truck
(all groups fictional)



Note: Groups are closest to the attributes with which they had the strongest associations

Summary flow chart for this step

**More On Showing Structures: Mixed and Other Methods**

Data based on behaviors and data based on judgments data are not, of course, mutually exclusive.

They often provide important insights when combined. For instance, brand-switching studies typically involve both behavioral and opinion-based data. "Brand switching," by the way, can be considered as falling under either "product substitution" or under "market impact." (As you may recall, those were mentioned as two of the possible bases for organizing market structures a few sections ago.)

More academically oriented practitioners have investigated various "latent" structures presumed to exist in markets. Sometimes these are latent classes, which in some ways resemble market segments. Sometimes, these are "causal models" or "path diagrams." Because there can be diagrams involved, some call these forms of mapping. Others do not. How to categorize this method remains problematic.

A Few Factors Sometimes Overlooked

In addition to price elasticities, many other factors aside from judgments can enter into market structure analysis. These sometimes are overlooked, and include:

- Purchasing time or purchasing cycles;

- Intermediaries between sellers and buyers (not just outlets, but such specialized groups as formulary committees for pharmaceuticals, regulators, insurance companies, and so on);
- Geographic distribution;
- So-called "exogenous" or environmental variables:
 - ◆ State of the economy;
 - ◆ Publicity and public opinion;
 - ◆ Governmental activity outside regulation;
 - ◆ Etc.

Also, models can be explicitly dynamic (attempting to predict change over time) or static (a snapshot of a given situation). Different methods are more suited to each basic approach. Dynamic approaches that take just a step or two into the future include market simulator programs. Other dynamic approaches that try to peer further into the future include product diffusion models, and an incredible array of forecasting techniques, probably even including the crystal ball.

More About Market Structures Versus Market Segments

Unless you have just skipped down here, or have a memory that kindly discards things, you may recall that most authorities do not consider market structures to be the same as market segments.

In fact, doing a thorough job with market segmentation generally requires

so much time and effort that you cannot get the full story on market structures in the same interview.

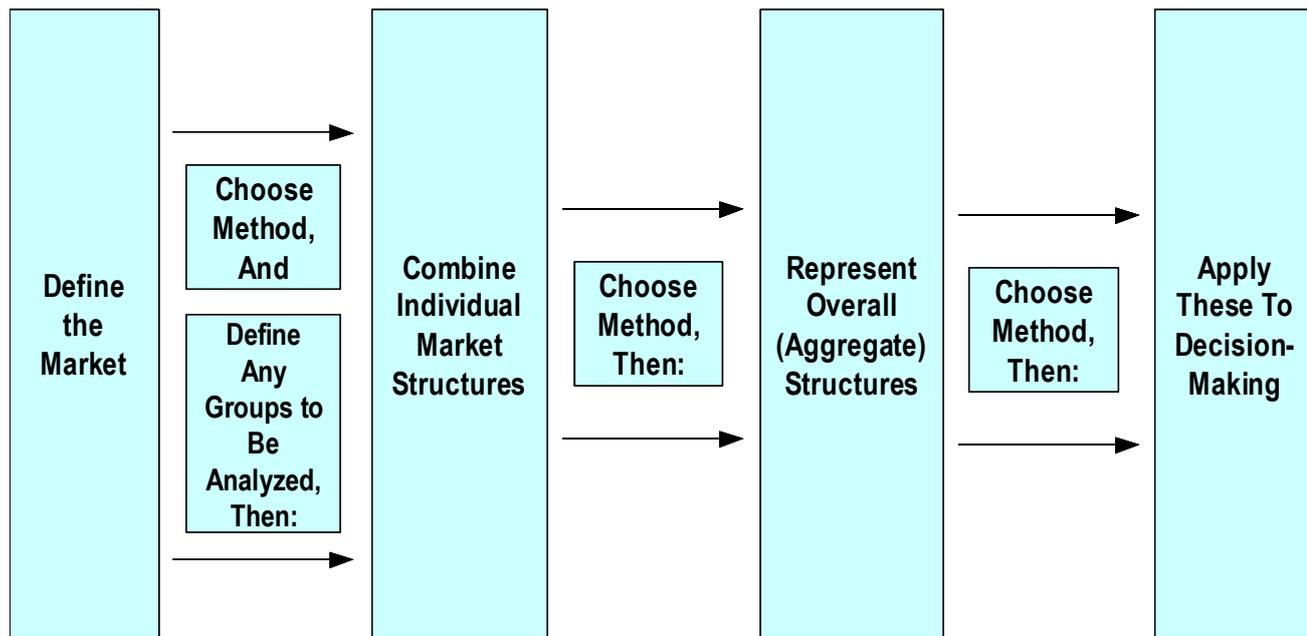
Here's the mantra on segmentation, in case you are wondering why this tends to fill most of an interview. Finding segments almost always is taken to mean looking for groups that fit these three criteria:

- Each has defined product-related needs different from those of all other groups;
- Each can be characterized or identified;
- Each can be reached selectively (or "targeted") with communications and marketing efforts. (Or at the very least, the segments you care about have to be groups you can reach selectively.)

Here we are putting aside the idea of "a priori segments," which are defined before looking at any data. Sometimes groups defined in this way in fact turn out to be segments, and many times not.

For instance, many banks used to "segment" customers based on the area of the bank that handled their business. There could be various lobby areas for the more indigent, some executive and professional areas, and finally the "upstairs," where all the big-money people got to visit. One major bank had seven such "customer centers," and they solemnly believed that each served a "segment" of the market. They believed this, that is, until they did a fairly thorough

Summary: Steps in Reaching a Market Structure



analysis of their customers' needs. When they did, they found only three distinct groups. Their "segments" were convenient and supported a long tradition, but they were wasting a lot of time developing separate sets of services for all of them.

In any event, if you do find segments, market structures may exist within market segments, just as they can within any group. Different segments of a market may structure a market differently—and indeed we would expect them to do precisely this, since their needs are different.

Many other structural concerns can differ for various segments, as well. For instance, different structural constraints may apply to some market segments, and not others. We need only think of such examples as different groups having differences in insurance coverage, or different groups having access to different public services (like transportation) to see that these environmentally imposed limitations may be crucial factors in understanding how segments work.

For these reasons, market segmentation and market structure analysis can appear in the same study. As we said earlier, though, given the capacity of most human beings to endure interviews without certain illegal recreational substances, it is hard to do justice to both issues at the same time. Almost invariably, "all in one" studies will skimp in some way on segments or on structures. Just to be fair, we should add that a few academics now claim that both segmentation and marketing structure analysis

can be done at the same time, and everything comes out fine. This may happen sometimes, but how often it works remains to be proven.

Finally, as many of you have observed, some practitioners confuse segments and structures so much that the line between them is nearly obliterated. You can have a conversation with some of these people and, at the end, not only will you not know what they are talking about, but you will feel confused about both subjects. We only hope that we have left you in somewhat better condition by the time you reached this point of the article.

Review: Basics Steps in Getting to Market Structures

It all seems simple when summed up in a nice diagram, but the problem of market structures is both large and complex. As the reference list at the end of this article suggests, you may get an entirely different answers about what "market structure analysis" absolutely needs to include, depending on the experts you consult.

Writing this article, your author tried as much as possible to keep to a central path, and not follow anybody's pet theories to the exclusion of others. This also represented an earnest effort not to make your feet fall asleep from the sheer excitement of reading about the topic. Tastes vary, though, and if that is just what you wanted, taking a careful look at the reference list following may provide just what you expected.

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