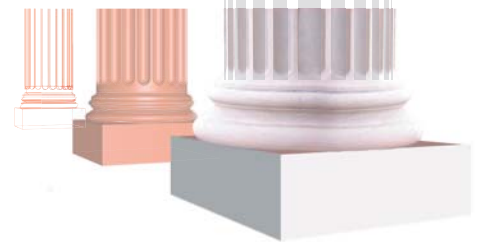




Price Sensitivity in Configurator Analysis™ Models: Modified van Westendorp Procedure



Traditional Marketing Research Techniques

Interactive Technologies +

Introduction

Configurator Analysis™ is a statistical procedure inspired by ecommerce “build-your-own-product” sites. The method closely mimics the decision-making process people use when determining the basic desired characteristics of a product or service prior to shopping for the best price. Logistical regression is used to determine the relative probability that features are related to purchase intent.

Background

Socratic Technologies' **Configurator Analysis (CA™)** is an online process that allows research participants to create their own ideal product or service bundles. Choosing from among possible combinations of features and service components, people “configure” products¹ that will most closely match their needs and expectations. In some cases, known sub-component pricing is used to closely mimic the real-life shopping experience in which specific features add cost to a base model.

In other instances, component prices are either unknown or hard to assign on a component-level basis. In these cases, an additional step is added to the “configuration” process in order to assess the price expectations of the fully-defined product or service. This price-assessment step, which is the focus of this whitepaper, is a modified form of van Westendorp Price Modeling.

The van Westendorp Price Sensitivity Meter was developed in the 1970s by Dutch economist Peter H. van Westendorp to examine patterns of price-consciousness. His method includes four questions related to each respondent's expectation for a product's price. Rather than using a direct approach, such as asking “How much would you pay for this product?” (a technique which has been shown to be quite unreliable) the van Westendorp approach is to “surround the market price” by asking four price-value relational questions.

Traditional van Westendorp Order

- At what price would you consider this product to be a bargain – a great value for the money?
- At what price would it start to get expensive, but still worth considering?
- At what price would it be so cheap that quality is doubted?
- At what price is it so expensive that it would not be considered at all?

The theory behind the van Westendorp model, as articulated by Canadian pricing specialist Paul Hunt, rests on two psychological precepts:

“**Theory of Reasonable Prices,**” which assumes buyers can examine an item and formulate a rough notion of what they would expect the item to cost or at least the range into which they would expect it to fall.

“**Price Signaling Quality,**” which assumes that some prices are “too low,” and that buyers will avoid products that are in this category, fearing poor quality.

At Socratic Technologies, we usually reorder the questions somewhat to allow for a normal consideration process, building progressively and ranging from “too cheap” to “too expensive.”

Socratic's Modified van Westendorp Order

- S1. At what price would it be so cheap that quality is doubted?
- S2. At what price would you consider this product to be a bargain – a great value for the money?
- S3. At what price would it start getting expensive, but still worth considering?
- S4. At what price is it so expensive that it would not be considered at all?

In some cases, the respondent's ability to answer these questions from a standpoint of reasonable expectations is hampered by lack of familiarity with pricing for the product category in general. Therefore we recommend giving a range of competitive prices as they exist (or may exist) in the market.

This also allows us to utilize a “smart pricing slider” through which the price point set at one “price event” becomes the lower bound for the next. Real-time error checking is used to create “bounding logic” to make sure the answers are in the correct ordinal position (e.g. “Too cheap (S1)” must be lower than “bargain (S2),” and “too expensive (S4)” must be higher than “would still consider (S3)”).

Numeric Slider Survey

Please answer the questions below regarding pricing for the multifunction device you just designed.

Multifunction devices such as this can range anywhere from US\$2,500 to US\$20,000.

Please enter your numeric responses in the spaces provided, using whole numbers only, or move the slider bar to indicate your response.

At what price would you consider this multifunction device to be so inexpensive that you question its quality and believability?

US\$0 [Slider] US\$69999 US\$ [30000]

At what price would you find this multifunction device to be such a good value that you would definitely buy it?

US\$0 [Slider] US\$69999 US\$ [30001]

At what price would this multifunction device start getting expensive, but would still be worth considering?

US\$0 [Slider] US\$69999 US\$ [40000]

At what price would it be so expensive that you would NOT even consider buying this multifunction device?

US\$0 [Slider] US\$69999 US\$ [50000]

Next

43% complete

Need help? Please contact the [Member Services Manager](#)

“Smart Pricing Slider” Example

¹Throughout this paper, the generic term “product” is intended to encompass products, services and transactions, all of which may be modeled using Configurator Analysis and van Westendorp PSM technique.



Introduction (continued)

Pricing and product development literature is rich with study results validating the use of van Westendorp PSM methodology. Some of the most compelling studies take known product categories and show how the technique accurately mirrors real-world price and share data.

Validation

The use of **van Westendorp Price Sensitivity Meter (PSM)** exercises to determine the market value of products, services and market intangibles (such as brand) have been documented and validated in many cases ranging from consumer products to NASA studies for the Kennedy Space Center.

Socratic Technologies has completed more than 20 studies in which some form of price validation (either using market data or convergent findings from other related studies) was obtained. The key finding from these and many other validation studies, is that the van Westendorp method, when properly implemented, produces results that are very similar to real-world, verifiable pricing and demand-share data.

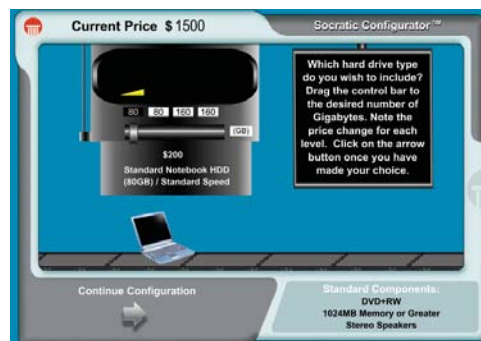
Many other companies have published findings similar to our own. Energy Market Services, for example, has published a case study in which a product configuration (for a commercial surge protector) was followed by a vW PSM exercise. They found that the vW approach yielded valuable data, which contradicted established company perceptions, but which was validated in post-market measurements.

A European study published by Ipsos-Insight used a 100-cell monadic online concept test, in which brand names were varied across eight appliance subcategories. A total of 300 interviews were completed per concept, or approximately 30,000 observations in total. The conclusions from this study were similar to our own. According to the study's author:

"The van Westendorp pricing methodology was used to predict the prices each brand would command in the marketplace. Comparisons to actual prices revealed a high degree of validity between the prices produced by van Westendorp, and actual retail prices. This was true across brands, and across subcategories."

Analyzing the Results

The van Westendorp technique can be used for both real-time and post hoc analysis. Real-time analysis is used to generate a purchase-producing price variable during the interview itself at the case-level. Post hoc analysis is used to understand the total market price sensitivity and ideal price ranges for the product in question.



Configurator Analysis Interface



Socratic's Unique Target Price Calculation

Socratic has developed a technique for producing a unique price at which each respondent is highly likely to purchase the product in question. This Unique Target Price can be used as a variable in subsequent questions in a live online survey.

Real-Time Calculation

In real-time analysis, Socratic uses each respondent's answer to choose a midpoint between the bargain price point and the getting expensive price point to calculate a price point that must lie in the respondent's consideration price range. We call this the Unique Target Point.

"Unique Target Point = Mid-point between the individual's bargain price (S2) and his or her point of "getting expensive (S3)"

As each person responds with a pricing expectation, the "unique target price" (UTP) is calculated for the individual by taking the midpoint between the price given being "The price at which the item would be starting to get expensive, so that it is not out of the question, but you would have to give some thought to buying it" and "The price at which this item would be such a bargain that you would buy it immediately." This midpoint calculation is designed to produce a price that always falls into a "reasonable price range" for the participant.

$$UTP_n = (HighConsider(S3)_n + Bargain(S2)_n) / 2$$

An additional calculation can be used to weigh the UTP by adding the influence of the extreme points ("price is it so expensive that it would not be considered at all" and "price would be so cheap that quality is doubted").

$$UTP = \frac{[(Bargain + HighConsider) / 2] + [(TooHigh) + (TooLow) / 2]}{2}$$

The respondent is then asked to answer a "purchase likelihood question" for his/her configured product at the unique target price. The likelihood scale used is either a five-point Likert scale ranging from "5" meaning "I definitely would purchase this product" down to "1" meaning "I definitely would not purchase this product;" or a 10-point anchored scale with the same endpoint labels.

Repeated measurements with these follow-up questions have shown that when the configured product is re-presented in full profile form along with the UTP, the resulting purchase intent is extremely high (up to 92% top-two-box purchase intent² in some case studies). This validates that the **van Westendorp PSM** can be used to detect a price for the individual that is likely to result in a high level of self-reported purchase likelihood.

Post Hoc Analysis

Post hoc analyses can be done using either the case-level UTP or several other aggregate measures to determine the relevant price range and related demand curves.



Socratic's Unique Target Price Calculation (continued)

Case-Level Analyses

Using the case-level UTP measures, Socratic calculates the percentage of people who would be very likely to purchase at price points in the range. This then allows for numerous sensitivity analysis options in which various price points can be tested for either profit or market share goal setting.

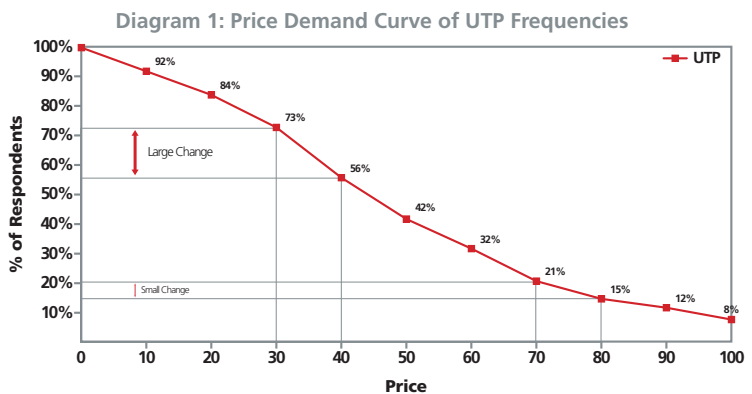
In order to project a price-demand curve for the various types of products that people configure, we begin by identifying those people who built similar configurations for themselves. For each major type of product configured, we then sort the "unique target prices" into categorical levels and assess the frequency with which the UTPs occurred. Only those UTPs that had a high probability of purchase (e.g. top-two-box meaning the respondent "definitely would" or "probably would" purchase) are counted.

In this sense, we are creating a market model in which various proportions of the target customers will be willing to purchase the configured product at certain price points. At some price point, virtually everyone would be willing to purchase. Of course, this price point may be below production cost and therefore economically infeasible.

The resulting frequency plot shows the number of people who would purchase the product at the various price points generated, as shown in the following diagram. (Diagram 1)

For this particular product model, we see that the highest demand (100% of UTP fall above this point) at \$6.30. Demand begins to fall sharply after the \$10.00 price point, declining to the lowest demand frequency at the \$100.00 price point with only 8% of the market still likely to purchase at this point.

For the lower range of prices (\$0 to \$50) we see that the demand is very elastic (significantly more demand is lost for every dollar of price increase.) However, less and less demand is lost for every dollar of price increase above \$50, making this portion of the curve rather inelastic.



²Top Two Box Percent = % of those who would definitely or probably purchase the item in question.

Revenue Maximization and van Westendorp IPP

The Indifference Price Point (IPP) tends to show the average price for the product in a mature market or, if there is a market leader with a predominant share, it can show the average price that manufacturer/ producer charges.

Revenue Maximization Point

Using the case-level UTP measures (demand curve), Socratic can also determine the theoretical price at which the balance of price point and proportion of people willing to make the deal maximizes the Unitary Revenue Contribution (URC). (Diagram 2).

Unitary Revenue Contribution = the mean revenue generated by each individual in the market at each given price point.

In this example we see that at the \$40 price point, 56% of the people surveyed would have a high probability of purchase, yielding a URC of \$22.40. Since this is the point at which the URC reaches its maximum, the \$40 price point is the one that will maximize revenue for any size of population.

This is the most reliable method for setting an "ideal price" for the product.

van Westendorp Indifference Price Point (IPP)

Another, now rarely used aggregate post-hoc measurement is the IPP, or Indifference Price Point, which is defined as follows:

vW Indifference Price Point = Point at which the number of respondents who consider the product a bargain (S2) = number of respondents who consider it to be getting expensive, but still worth considering (S3). (Diagram 3)

In this diagram, the IPP is approximately equal to \$48. According to van Westendorp theory, this usually represents either the

- median price actually paid by consumers for a known, existing product, or
- the average price of a product produced by a market share dominating, leading producer.

Unfortunately, this price setting method has not been as reliable as the URC method.

Diagram 2: Unitary Revenue Contribution Maximization

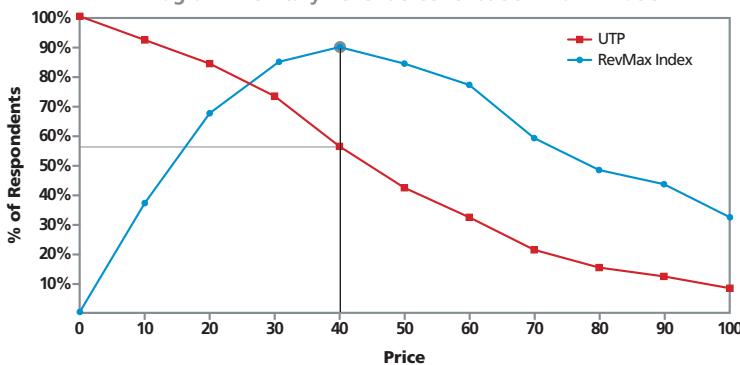
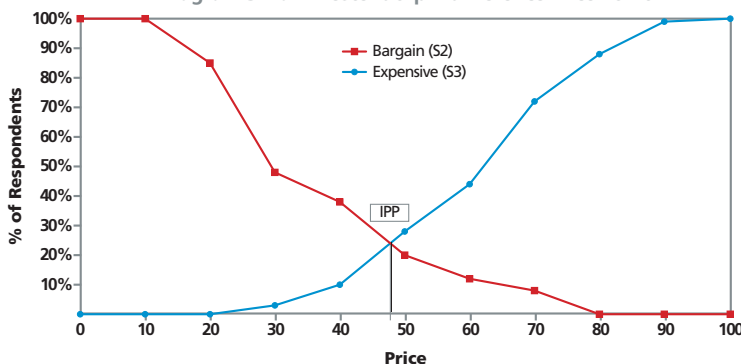


Diagram 3: van Westendorp Indifference Price Point



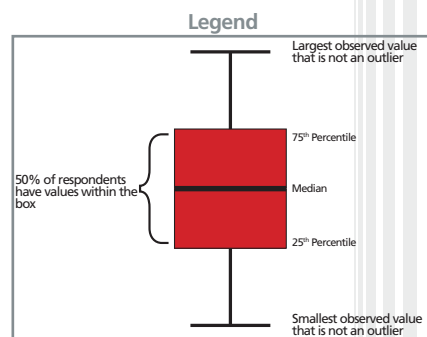
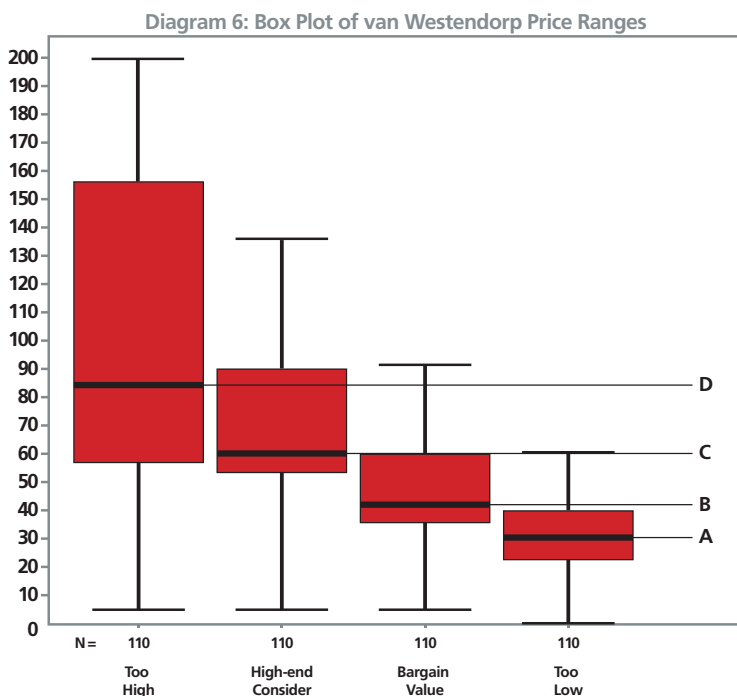
Price Range Statistics

Looking at the distribution of the van Westendorp price ranges can give a clear sense of how the perception of value plays out across the entire sample.

Aggregate Analyses

Socratic uses several other ways of presenting the van Westendorp data to maximize the value of the information content. We begin by presenting the general output from these questions as box plots, which capture the range of answers falling into each price category. Letters in the diagram indicate the median price for each question's response range. (Diagram 6)

These box plots represent the distribution statistics of the answers as explained in the following key: (Legend)



Reported Weaknesses and Compensating Actions

Most of the issues reported in conjunction with van Westendorp technique can be compensated for and avoided through proper setup and pre-evaluation education.

Lack of Information

Some researchers have reported poor or misleading results using the [van Westendorp PSM](#) technique, although they do not appear any more or less frequently than with other price-value assessment techniques such as conjoint analysis or discrete choice analysis. Most of the issues with the van Westendorp procedure are correctable by a few simple procedures.

Another problem associated with the van Westendorp approach is that it may rely on base assumptions that are not very realistic. It assumes, for example, that perfect access to information about all competitive products exists, that perfect competition exists (in which access to and distribution of all products is equal), that no barriers to switching exist and that the unit of measurement is a single purchasing decision (which has neither volume nor other frequency measures associated with it).

In fact, most forms of perceptually-based pricing techniques make similar assumptions. And while these assumptions may not yield a high degree of verisimilitude, if they are applied equally to all competitive products, the bias stemming from the hypothetical nature of the exercise can be controlled.

In addition, the output from these exercises should be regarded as a “distant early warning system” for products that are shielded from strong competitors by market barriers (e.g. a strong distribution system, long-term contracts, a powerful brand awareness, etc.) Over time, these barriers can be assailed and, barring product value-enhancing development strategies, can leave an original competitor at a disadvantage.

Need for More Research

At this time, a number of positive results have been seen using the basic [van Westendorp PSM](#) technique. Most of the validation has been related to real-world situations, adding face-validity to the results. However, there still remain a number of issues related to inter-method reliability and the degree to which conjoint and choice-based techniques produce similar and/or corroborating findings. Hopefully, more research will be performed in this area and that the publication of these findings will contribute to the industry’s use, refinement and customization of the van Westendorp pricing analysis technique.

Unrealistic Price Expectations

Some studies have reported that the acceptable price range is either too low or too high to be “reasonable.” Within the context of the exploration, it is assumed that people, when armed with sufficient information about the product, can state what they would consider to be a “reasonable price.” One the reasons that this doesn’t always work well is that people either have no experience (or infrequent experience) in the category.

In both of these cases Socratic uses a very simple “fix” that can correct the majority of these anomalies. Before beginning the van Westendorp battery, we present the known range (from cheapest to most expensive) for the competitive set in the market sector on which we wish to focus. This helps people, who have no recent experience, recalibrate their “reasonable expectations” and act with “bounded rationality” in their price/value considerations.

Overlapping Product Strata

Another source of error may be that varying levels of the category exist (e.g. home-use, office use, industrial use, and so on) and the respondents may focus on an unintended level. This is particularly true when a general product description is used. The best defense against this situation is a very clear description of the product being tested. In the online environment, Socratic makes use of glossaries, illustrations, animations and educational demonstrations designed to thoroughly describe the forms and functions of the product in question. One such tool is our [Socratic ProductExhibitorSM](#) demonstration application.

Socratic ProductExhibitorSM

Socratic's ability to show a package from all sides, zoom in on features, expand label text and demonstrate the package's functionality adds to the respondents' ability to accurately respond to product attribute questions.

Description

The Socratic ProductExhibitor provides an excellent way of presenting a product or packaging concept on the Web with the most detailed information possible, yet without overloading the respondent with minutiae. This tool allows the respondent to study aspects of the design, packaging, text, and other elements used to communicate the concept or actual product attributes.

Characteristics

The ProductExhibitor provides a platform for scrutiny of a product or package in a standard viewing environment. Rotate, zoom, move and re-position are standard navigation features built into the tool. Glossary entries, pricing, and other information can be applied to programmable hot buttons. The tool tracks all movements, time spent in examination and detects whether "additional information" is accessed or not. The ProductExhibitor, like all Socratic WebComm tools, can be fully integrated within our active survey environment. Following exposure and study, standard ratings and measurements can be captured using a survey process.

Output

The output from the ProductExhibitor is generally related to the quantitative data captured in the survey following the exhibition. These data may range from attribute communication ratings, purchase intent, preference, likeability, etc. to open-ended statements about the concept in general. Behavioral data (e.g. time examining the product, whether the respondent zoomed in on the text, whether the glossary was accessed, etc.) can be used as co-variants in the analysis of data (i.e. "Did those who read the text provide higher ratings?" etc.).

Like the name suggests, the Socratic ProductExhibitor is a standard interface for displaying and demonstrating product characteristics and/or packaging options. Just like in the real world, where display items are put out for customers to examine, the ProductExhibitor allows participants to take a closer look, view the product from various angles, get more information on specific features and spend time becoming more familiar with a product before making purchase decisions.

In the research design application for this technique, we can use the ProductExhibitor in several ways. First, we can use this to give respondents more in-depth exposure to graphic design and feature elements prior to asking them about preferences or comparisons to other, competitive items. Studies involving this type of product demonstration show that findings from product ratings and price-feature trade-off exercises are more like results from tests where respondents were actually able to view a real product, than results from tests where the stimulus was a static picture or text description.



Socratic ProductExhibitorSM



Summary

Summary

Configurator Analysis™ is a statistical procedure inspired by e-commerce “build-your-own-product” sites. The method closely mimics the decision-making process people use when determining the basic desired characteristics of a product or service prior to shopping for the best price. Logistical regression is used to determine the relative probability that features are related to purchase intent.

Using a bounded logic “smart pricing slider” system, Socratic begins the exercise by focusing respondents on “what is too cheap to be good?” This helps establish a reasonable floor for price considerations and eliminates anchoring the respondent on a bargain price that is actually too low.

Pricing and product development literature is rich with study results validating the use of **van Westendorp PSM** methodology. Some of the most compelling studies take known product categories and show how the technique accurately mirrors real-world pricing data.

Socratic has developed a technique for producing a unique price at which each respondent is highly likely to purchase the product in question. This Unique Target Price can be used as a variable in subsequent questions, in a live online survey.

Once the data are collected, a demand curve is produced using the cumulative percentage of the people with a high purchase probability for a product at any one price. The UTP (Unique Target Price) is the price at which each individual is very likely to purchase the product.

Looking at the distribution of the van Westendorp price ranges can give a clear sense of how the perception of value plays out across the entire sample.

The Unitary Revenue Curve tends to show the ideal price for the product in a mature market and represents the price at which revenue per unit is maximized.

The Range of Competitive Prices helps show the full range of viable pricing strategies. At the high end of the range, producers will begin to lose market share, but reap higher-than-normal profits. At the low end of the range, producers will gain share through enhancing value with a lower price.

Most drawbacks reported from those using van Westendorp technique are caused by:

- Not enough information about the product being evaluated
- Lack of respondent's current knowledge about competitive pricing in the market
- Confusion regarding the intended market for the product.

Most of these issues can be compensated for and avoided through proper setup and pre-evaluation education.



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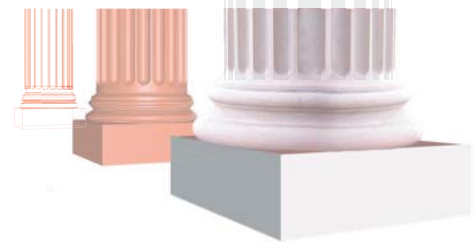
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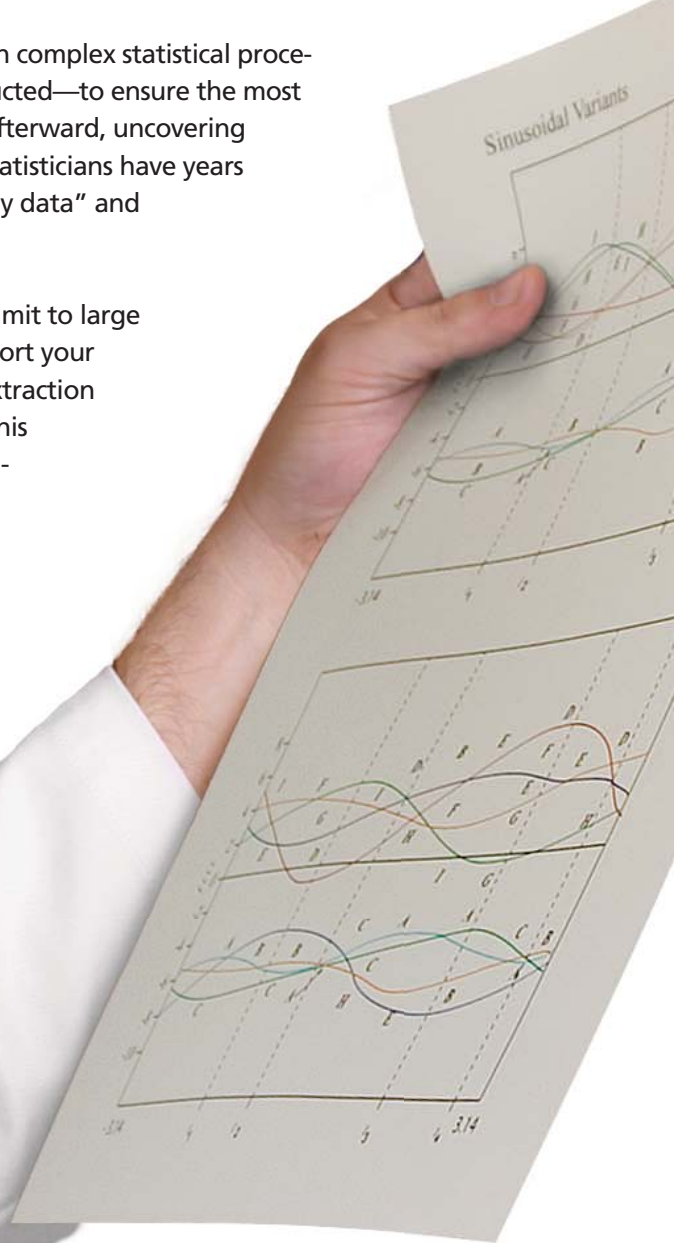
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