Cognitive Segmentation: Modeling the Structure and Content of Customers' Thoughts

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ABSTRACT

This paper proposes a cognitive segmentation technique that models both customers' cognitive content and structure. Cognitive segmentation provides a quantitative operationalization of idiographic cognitions that can be compared and integrated across customers to move beyond the in-depth understanding and wide generalizing trade-off. In addition, cognitive segmentation utilizes participants' own semantics for eliciting and aggregating cognitions. This method allows researchers to understand content in light of structure, as participants' elicited cognitive contents are further interpreted as a function of the complexity of their cognitive structures. The conceptual

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foundations from personal construct theory as well as a description of the nine-step implementation process whereby participants fill out a modified version of Kelly's Repertory Grid and complete Borman's trait implication procedure are provided. An application illustrates how cognitive segmentation can identify and assess the size potential of each customer target as a function of their cognitive content and structure. A discussion of the results and directions for further research are also provided. © 2009 Wiley Periodicals, Inc.

Understanding of customers' wants and needs is the starting point of any business endeavor (e.g., Drucker, 1954). This philosophy is alive and well as marketers design customer-centric organizations, adopt the customer's viewpoint, listen to the voice of the customer, and try to get into the head of the customer. In fact, knowing what and how customers think has become one of the primary concerns of marketers (e.g., John et al., 2006; Woodside, 2006; Zaltman, 1997).

Such preoccupations are legitimate since research shows that the creation and implementation of successful marketing strategies require an advanced understanding of customers (e.g., Gebhardt, Carpenter, & Sherry, 2006; Kohli & Jaworski, 1990; Narver & Slater, 1990). However well understood customers are, assessing the size of potential target segments relative to the overall market is also necessary. This double constraint has required managers to make trade-offs between the depth with which each customer's cognition is represented and the ability to categorize customers into quantifiable segments.

In order to go beyond such trade-offs, this article proposes a cognitive segmentation technique. The objective of cognitive segmentation is to group individuals according to their cognitive content and structure by (1) capturing cognitions of each customer while incorporating their semantic uniqueness, and (2) integrating and comparing those cognitions on a large scale. It is, to our knowledge, the only segmentation technique that is directly based on respondents' cognitive content and structure. Cognitive segmentation is a response to Lewis and Klein's (1985) suggestion that personal construct theory would be a fertile conceptual ground for a new methodological paradigm that will "capture the elegance of idiosyncratic processing while affording the researcher a degree of commonality from which clusters or segments may be derived" (p. 203). Cognitive segmentation is conceptually grounded on the premises of Kelly's (1955) personal construct theory, which proposes that people develop cognitions in a way that maximizes the correct anticipation of future events in their environment.

Cognitive segmentation is based on two methodologies: (1) an adaptation of Kelly's Repertory Grid (Rep Grid), whereby exemplars from the domain of study are compared and contrasted to uncover cognitive content, and (2) the implementation of Borman's trait implication procedure (1983, 1987), which standardizes the phenomenological realities of each participant by transposing the elicited cognitive content into a common metric. This new segmentation technique is a unique blend of these aforementioned methodologies. Insights from both the Rep Grid and the trait implication procedure are combined together in order to extract clusters of customers with similar cognitive content and to assess their capacity to cognitively discriminate among stimuli.

In Figure 1, the dotted line illustrates the trade-off researchers face between in-depth understanding and quantifying customer segments. Point A represents techniques that provide rich insights into customers' thoughts such as free-response

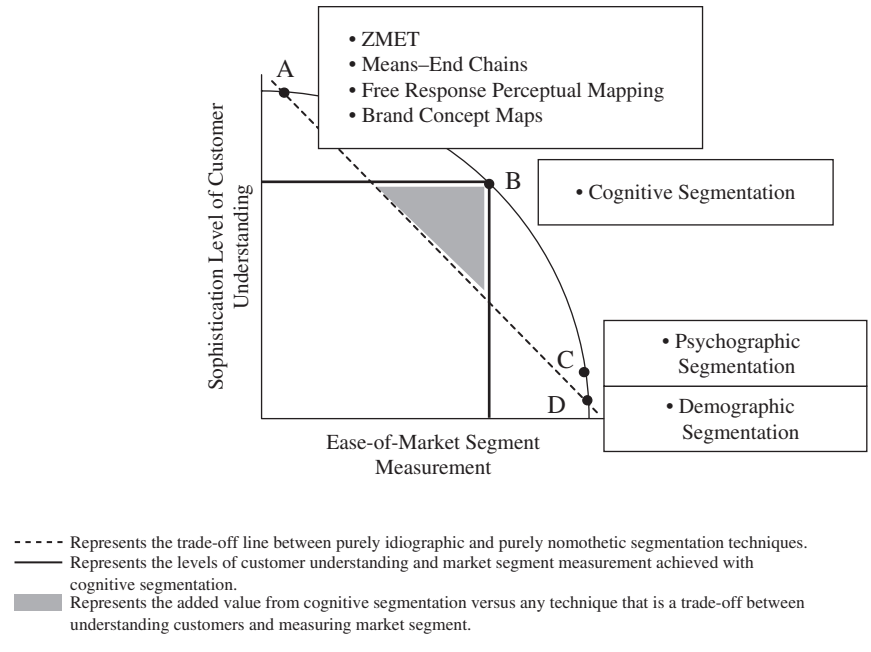

Figure 1. Conceptual representation of cognitive segmentation compared to other techniques.

perceptual mapping (e.g., Boivin, 1986; Green, Wind, & Jain, 1973), means–end chains (e.g., Bagozzi & Dabholkar, 1994, 2000; Gutman, 1982; Olson & Reynolds, 1983; Reynolds & Gutman, 1984, 1988), the Zaltman Metaphor Elicitation Technique (ZMET) (e.g., Christensen & Olson, 2002; Zaltman, 1997), or Brand Concept Maps (John et al., 2006). However, these techniques do not allow for integrating heterogeneous cognitive profiles unless the researcher's semantic structure is imposed on the elicited cognitive content (Grunert & Grunert, 1995; Woodside, 2004). For instance, if a prospective automobile buyer were mostly looking for a vehicle with good fuel economy, would it be appropriate to categorize him/her as an environment-friendly consumer? Could he/she actually be a value-conscious consumer? On the other hand, traditional psychographic and demographic segmentation techniques (points C and D) are very suitable for quantitative comparison and integration (e.g., Churchill & Iacobucci, 2001; Lesser & Hughes, 1986; Wells, 1975). However, they rest on the risky assumption that customers' cognitive contents and structures are homogeneous enough to warrant aggregation. Note that a few quantitative techniques allow respondents to choose their own attributes (e.g., Steenkamp, Tripj, & Berge, 1994), although the end result is disconnected from the initial individuals' perspectives and does not allow going back and forth between the idiographic and nomothetic views in order to deepen the analysis. Cognitive segmentation (point B) helps bridge the gap between these varied techniques. The bold line in Figure 1 shows that cognitive segmentation provides a level of customer understanding close to that of idiographic techniques while providing results quantifiably similar to those achieved by demographic and psychographic methods. Cognitive segmentation does not compromise but, rather, pushes the segmentation frontier

farther out. As represented by the gray area in Figure 1, it adds value beyond traditional trade-offs made between deep understanding and wide generalizing.

Cognitive segmentation provides two additional benefits. First, respondents guide themselves through the procedure, which minimizes potential researcher involvement bias. Second, cognitive segmentation allows the researcher to deconstruct respondents' cognitions at various depths, which enriches the analysis and interpretation of customers' segments. For instance, even if it is determined that two segments in the restaurant market can be differentiated at an overall level regarding the criterion "food quality," does this differentiation hold true for other cognitive dimensions between segments? Knowing if customers have consistently different views on food's spiciness, flavor, cooking time, or versatility with wines would indicate whether a differentiation strategy based on "food quality" alone is viable.

The remainder of this article begins with a review of the literature, highlighting the methodological characteristics of cognitive segmentation as well as the central tenets of personal construct theory. Then we provide a step-by-step description of cognitive segmentation, explaining how the process is implemented. Finally, we present a cognitive segmentation study in the service domain to illustrate each step of the procedure.

LITERATURE REVIEW

Cognitive segmentation reconciles three objectives that are seemingly contradictory: (1) taking into account each participant's semantic variations in the analysis of participants' cognitions, (2) working under the assumption that content and structure are interrelated, and (3) quantifying and generalizing participants' cognitive content and structure.

The Variation in Participants' Semantics

The common approach to research in the behavioral sciences is based on the systematic classification of phenomena as a function of their attributes. According to Nunnally (1978), a major difficulty of classifying phenomena is the development of a system of verbal categories relevant to the attributes of the object being studied. Individual interpretation of various attributes can only be attained by understanding the relationships between cognition and the verbal description of each person-object evoked in any research study (Mick & Buhl, 1992; Thompson, Locander, & Pollio, 1989; Woodside, Sood, & Miller, 2008). Likewise, it is critical to account for existing variations in the participants' semantics and the researchers' interpretations so that the analysis is driven by the customer's mind rather than by that of the researcher (Grunert & Grunert, 1995; Zaltman, 1997).

The challenge of eliciting consumers' cognitions is that once the researcher creates the categories for coding participants' thoughts, it is the researcher's interpretation of the semantic distance among the participants' answers that determines which category they fall into (Grunert & Grunert, 1995). Such an approach is suboptimal given that much research shows significant semantic differences among individuals (e.g., Eden & Jones, 1984; Grunert & Grunert, 1995; Jankowicz, 1987; Mick & Buhl, 1992; Thompson, Locander, & Pollio, 1989).

For example, if two respondents both claim they value "a clean environment" during a service encounter, one of the respondents may actually pay attention to whether the physical elements are soiled, whereas the other individual may focus on a tidy, uncluttered space. The cognitive segmentation approach allows participants to use their own words to describe their cognitive content as well as to give a definition of the meaning of these terms. In addition, during the second stage of the segmentation process, participants provide estimates of the semantic distances between their words and a common benchmark (i.e., established service quality measured as per the example above). These steps give researchers the possibility of using respondents' meanings to compare and aggregate cognitions, rather than just relying on descriptors whose semantic equivalence is highly questionable.

The Interdependence of Cognitive Structure and Content

Scott (1962) defines cognitive content as the mental representation of objects and their attributes, and cognitive structure as the interrelationships among those objects. Researchers have stressed the importance of working under the assumption that both cognitive content and structure are interdependent with respect to the true nature of cognition (Christensen & Olson, 2002; Landman & Manis, 1983; Sujan, Bettman, & Sujan, 1986). Moreover, existing applications of Kelly's methods typically have not taken full advantage of the Rep Grid methodology. These reported studies provide every participant with predetermined indicators rather than allowing each to create his or her own customized rating dimensions (e.g., Durand, 1979; Hallsworth, 1988; Tan & Dolich, 1980; Zinkhan, 1981; Zinkhan & Braunsberger, 2004; for a notable exception, see Gengler, Howard, & Zolner, 1995).

Attempting to overcome these shortcomings, cognitive segmentation interprets content in light of structure and vice versa. A given participant is defined by two cognitive features: the complexity of the respondent's cognitive structure (which indicates the discriminant power of a person's cognition) and his/her cognitive content (which indicates what the person's thoughts focus on). Structure depends on the degree of refinement of the distinct underlying cognitive dimensions obtained by identifying common patterns of cognitive contents; thus, structure depends on content. A subject's cognitive content is then further interpreted as a function of the discriminant power afforded by an individual's cognitive structure; thus, content depends on structure.

Quantifying the Phenomenological Views of Customers

Researchers using purely idiographic approaches cannot quantify or operationalize their findings. As a consequence, the holistic insights gained from customers cannot be compiled and are of limited use for managers and researchers (Arnould & Thompson, 2005; Frost, 1982; Jankowicz, 1987). Moreover, researchers cannot aggregate the cognitive content of multiple participants, because there is no common basis on which individual idiosyncrasies can be compared. Additionally, the complexity of aggregation becomes overwhelming as sample sizes increase (Grunert & Grunert, 1995; Jankowicz, 1987; Marsden & Littler, 2000). In cognitive segmentation, idiographic data are obtained from the Rep Grid and quantified using Borman's trait implication procedure (1983,

1987). Therefore, cognitive segmentation takes idiographic techniques one step further by numerically operationalizing content that can describe and size the market in terms of what customers really think.

Personal Construct Theory

Kelly (1955) asserts that the structure and content of an individual's knowledge is represented by a set of personal constructs that are shaped as a function of how accurately they can predict future outcomes. By observing their environment, individuals collect information to form expectations about future events (i.e., anticipations). These anticipations are then tested as individuals experience these events, ultimately leading to their support or contradiction. People seek to experience specific situations where their personal constructs are likely to be used. Therefore, a person's behaviors are determined by whether they allow testing of the set of constructs used in his/her environment. Through this procedure, new personal constructs are formulated and/or existing ones are revised to provide more accurate anticipations of future experiences. A key point of Kelly's theory is that individuals understand events through a similarity and contrasting process in order to acquire meaning (Lichtenthal & Goodwin, 2006; Marsden & Littler, 2000). The notion that contrasting is essential to the creation of meaning has received ample support in psychology (e.g., Eden & Jones, 1984; Marsden & Littler, 2000). Similarly, semiotics posits that meaning is derived from contrasting a word with its logical opposite (e.g., O'Shaughnessy & Holbrook, 1988). In Kelly's theory, another important element is that the Rep Grid must allow participants to communicate their thoughts through their own language and not be constrained by the researcher's choice of words (Eden & Jones, 1984; Grunert & Grunert, 1995).

According to Kelly's Range Corollary, a personal construct (*PC*) is only relevant for the construction of a particular event. The event for which a *PC* is relevant represents the focus of convenience of that *PC*, namely the situation in which it is used. Therefore, an individual holds specific domain-related constructs relevant to discriminate and predict events from that domain as well as to process information when those events are unfolding. *PC*s are elicited through a Rep Grid, a method suitable for the study of any substantive domain (Adams-Weber, 1979; Bannister & Mair, 1968; Lichtenthal & Goodwin, 2006). An example of this methodology can be found in Borman's (1987) work, where he conceptualizes the notion of "work constructs" as *PC*s that U.S. Army officers use when evaluating job incumbents. This work highlights two types of *PC*s: (1) idiosyncratic *PC*s, which represent cognitive content specific to one U.S. Army officer when evaluating, and (2) common *PC*s, which represent cognitive content shared among U.S. Army officers. In sum, the power of Kelly's approach is that it captures cognitive content within the person's specific meaning of his/her knowledge while also integrating cognition, affect, and behavior within the act of "construing" (the formulation and testing of anticipations).

The Trait Implication Procedure

Kelly suggests that an individual's *PC*s are cognitively organized as a system, which he calls the Personal Construct System (*PC System*). The *PC System* represents the entire set of *PC*s used in a cognitive domain along with the

interrelationships among those *PC*s. Cognitive segmentation relies on the work of both Kelly and Borman in that *PC*s represent the content of cognition while *PC System*s represent that content organized into a structure. Borman (1987) validates this claim by developing a procedure in which participants indicate the semantic similarity between their self-generated thoughts (i.e., *PC*s) and a set of reference statements chosen from the domain under investigation (e.g., measurement items from existing scales in the domain). These numerical vectors from the similarity ratings between each participant's own thoughts and the reference statements operationalize participants' self-generated cognitive content and enable further multivariate analysis for comparison and contrast of their cognitions. Factor analysis is performed on the intercorrelations of personal constructs to determine the cognitive structure of each participant based on their number of common and idiosyncratic constructs, as well as the number of distinct cognitive dimensions (i.e., the underlying factors extracted). The literature suggests that people with more cognitive dimensions discriminate better between stimuli because more concepts are available for evaluation and perception (Bieri, 1955). For example, if two stores are perceived as being similar according to one dimension (e.g., cleanliness), they may still be differentiated according to another dimension (e.g., friendly employees). Likewise, a more refined dimension (i.e., on which more *PC*s are loading) allows for the identification of subtle differences between stimuli (e.g., Kanwar, Olson, & Sims, 1981; Zinkhan & Muderrisoglu, 1985). These refinements also help customers more effectively anticipate and discriminate between events because more "personally accurate" criteria (e.g., the *PC*s "dust-free shelves" and "immaculate floor" for the "cleanliness" dimension) are available for comparison (Kelly, 1955). Therefore, participants' discriminating capacity increases as their cognitive structure includes more *PC*s loading on more distinct dimensions.

COGNITIVE SEGMENTATION TECHNIQUE

The following section provides a description of the nine steps involved in cognitive segmentation whereby respondents complete the Rep Grid and trait implication procedures. Steps 1 through 3 are completed in one seating while steps 4 through 9 are completed in a subsequent seating. In order to illustrate the application of this technique, a study was conducted in the service domain with 106 undergraduate marketing students at a large state university who filled out a variant of Kelly's Rep Grid for in-class extra credit.

Step 1: Filling in the Rep Grid

In Step 1, participants self-generate stimuli that represent personal exemplars from the domain studied (e.g., service encounters), which are subsequently used for eliciting their cognitions. The diversity of stimuli generated depends on the study objectives (more diversified stimuli yield more generalizable outcomes). For each stimulus selected, a contrasting stimulus must also be chosen by the participant for the elicitation task.

The study's participants were asked to identify one service provider with whom they had a good experience and one with whom they had a bad experience for six

Service Organization	Phone	Classes	Primary Care Physician	Theme Parks	Sit-Down Restaurants	Banks
Very good quality experience	A *Verizon*	C *Algebra*	E *Dr. Garret*	G *Disney*	I *Chili's*	K *Bank of America*
Very bad quality experience	B *Sprint*	D *Jazz*	F *Dr. Collins*	H *Six Flags*	J *Rio Bravo*	L *SunTrust*

Figure 2. Example of Rep Grid for participant #1.

different industries: communication, education, health care, entertainment, restaurant, and banking. Thus, total of 12 service encounters were elicited from each participant. (Figure 2 shows an example of the Rep Grid filled out by one participant.)

Step 2: Filling in the Triads

Here, participants are directed to triads of three stimuli listed in their Rep Grid. Each triad is composed of two stimuli that have something in common (e.g., good encounters with a communication provider and a restaurant) that differentiate them from a third stimulus. This last stimulus needs to be a contrasting stimulus for one of the other two stimuli in the triad (e.g., a bad encounter with a restaurant) so that participants can later engage in a similarity-contrast task.

In the study, two triads included two good service experiences and one bad while the other two triads included one good experience and two bad service experiences. For example, cells A, B, C, from the Rep Grid in Figure 2 were filled in by participant #1 with Verizon, Sprint, and Algebra, respectively. Therefore, that participant developed a triad comparing how good experiences with Verizon and Algebra differed from the bad service experience with Sprint.

Step 3: Eliciting the *PC*s

For each of the triads in step 2, participants indicate the reasons why two of the stimuli are similar but different from a third. Participants provide a "label" for each of the reasons. Thus, each label represents the name of a *PC*, and its corresponding definition represents the content of that *PC*. *PC*s represent the description of the cognitive content in each participant's own words and serve as basic data points in cognitive segmentation. Respondents run through the elicitation tasks themselves following written instructions. On average, steps 1 to 3 require 30 to 35 minutes for completion. Because subsequent multivariate analyses require the same number of *PC*s for each participant, it is necessary to include an importance rating whereby participants rank order their *PC*s accordingly. This allows for considering the most important *PC*s for each individual. Figure 3 illustrates a few examples of the *PC*s elicited from one individual in the study; 686 different *PC*s were obtained from 96 participants. (Ten cases were dropped due to non-completion of the task.)

Step 4: Trait Implication Procedure

At this point in the process, Borman's trait implication procedure (1983, 1987) is employed to compare participants' *PC System*s. Between steps 3 and 4, the

Personal Constructs	
Label*	Reason**
Friendly	Very nice
Honest	Very up-front and to the point
Proximity	Easy to talk to
Fun	Entertaining
Fast	Did not take too long
Good service	Good reception
Easy	Understandable
Nice	Very easy going
Accessible	Locations everywhere

* The labels of the *PC*s, assigned by the participant, are based on the reasons given to explain why two elements of the triad are similar but different from the third element.
** The content of the *PC*s corresponds to the reasons given by the participant to explain why two elements of the triad are similar but different from the third element.

Figure 3. Examples of personal constructs (*PC*s) elicited from participant #88.

researchers transcribe the *PC*s for each participant into an individualized matrix in which the columns consist of the participant's *PC*s elicited from the first three steps. The rows of the individualized matrix consist of common reference statements. Ideally, researchers should use existing validated taxonomies of the dimensions of the domain of interest. Participants rate how similar their column labels are to each of the reference statements using a 7-point scale (1 = my label is completely different from the reference statement; 7 = my label is very similar to the reference statement). Figure 4 provides a facsimile of the matrix presented to one participant. The length of the rating task depends on the number of *PC*s elicited, but, on average, the duration is 30–35 minutes. The number of reference statements used is determined by the range of meaning that must be covered by the trait implication procedure. In this case, reference statements from existing service quality scales were used (i.e., Aldlaigan & Buttle, 2002; Dabholkar, Thorpe, & Rentz, 1996; Parasuraman, Berry, & Zeithaml, 1991; Reid & Gundlach, 1983; Reidenbach & Sandifer-Smallwood, 1990). The items selected from these scales covered the widest possible range of meanings in service quality (i.e., scales with the least overlapping contents were chosen). The 44 reference statements and their 10 underlying dimensions are listed by source in the Appendix. The order of the 44 reference statements was alternated across participants to minimize order effects. This yielded a vector of 44 values numerically defining each *PC,* permitting the comparison of *PC System*s across participants using multivariate analyses.

Step 5: Construction of the Aggregate Content Matrix

Once each participant's individualized matrix is completed, the researcher combines them into an aggregate matrix of *PC*s. In the aggregate matrix, the reference statement ratings for each *PC* are transposed to the columns, while each row represents a vector of each participant's labels concatenated to create one row per participant. Thus, each row represents one participant's Personal Construct System. Each cell in this matrix represents the degree of similarity between a participant's *PC* and one of the reference statements. In this illustration, the four

	Friendly	Honest	Prox-imity	Fun	Fast	Good service	Easy	Nice	Acces-sible
Clean, attractive, and convenient public areas—consumers can easily access clean public areas.									
Easy to find what you need—consumers can easily find what they need from the service provider.									
Easy to move around—consumers are not obstructed to move around in the service provider's location.									
Service availability—consumers can gain access to the service on demand									
Courteous treatment through media—service provider is polite during communication (phone, e-mail, fax, etc.).									
Willingness to handle returns/exchanges—the service provider wants me to feel satisfied with the service or they refund my money back.									
Handling consumer complaints—employees are able to address consumer complaints exactly and instantly.									
Convenient access—consumers can easily gain access to the service provider (parking, online, telephone, fax).									

1 = my label is completely different from the reference statement; 7 = my label is very similar to the reference statement

Figure 4. First page of trait implication matrix for participant #88.

most important *PC*s for each participant were retained by asking them to rank their *PC*s according to their importance for understanding service experiences. Therefore, a participant's cognitive profile was represented as one row of the aggregated matrix along 176 columns (4 *PC*s × 44 reference statements). Note that, for the sake of the demonstration, a fairly inclusive rule was chosen (i.e., the four most important *PC*s) that resulted in the inclusion of most of the respondents. However, if the average number of *PC*s elicited is high or if researchers only want to model respondents with more complex cognitive contents, it is possible to retain a larger number of *PC*s per participant.

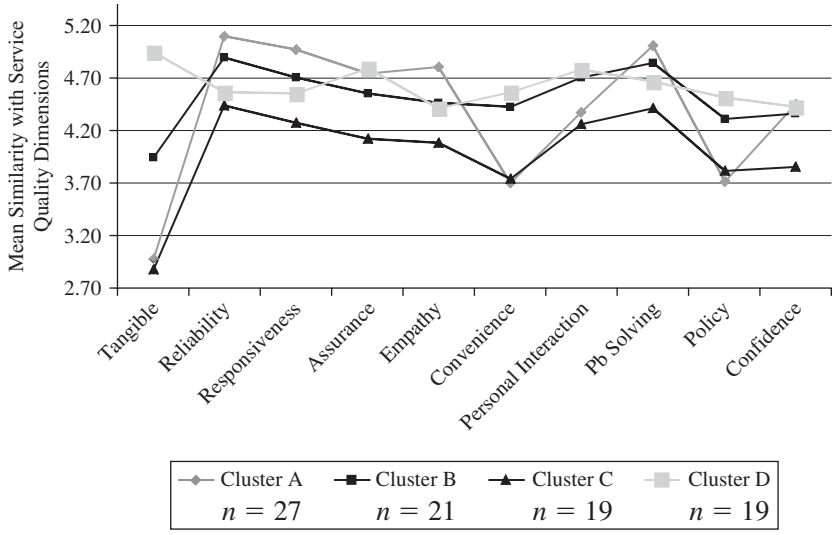

Figure 5. Aggregated description of clusters by service quality dimensions.

Step 6: Obtaining Customer Segments

In order to establish segments as a function of participants' cognitive content, the aggregate content matrix is subjected to a hierarchical cluster analysis using correlations as the similarity measure. Correlations are most appropriate when there is a need to focus on patterns rather than magnitudes, which is the case with cognitive segmentation since content does not have intensity (see Hair et al., 1998). Following Johnson (1998), a combination of three indicators determines the most useful number of clusters. First, large pseudo-F values are sought for indication that at least two clusters are different. Second, small pseudo-T values are required to determine that the last two clusters joined are similar. Finally, large drops in R^2 show significant decreases in the explained variance of the variables used and indicate the end of the clustering procedure. In this illustration, five participants who had fewer than four *PC*s, three for whom data were missing on the trait implication procedure, and two who had the same ratings on all their *PC*s were dropped from the data base, which left 86 rows in the aggregate matrix. Four clusters were obtained with cluster A, B, C, and D containing 27, 21, 19, and 19 subjects, respectively. (See Figure 5.)

Step 7: Investigating Segments' Cognitive Content

Once the segments have been identified, there are three levels of cognition at which the results can be interpreted, with each level providing different insights. First, researchers can analyze the characteristics of the clusters for each of the units of cognition available (i.e., each column of the aggregate cognitive content matrix); this is called the *totally deconstructed view*. Using this approach, for each of the dimensions of the domain investigated, the researcher can access as many units of cognitive content as there are *PC*s, multiplied by the number of

reference statements reflecting that dimension. For the illustration, four of the reference statements reflected the "Tangible" dimension of service quality. As a result, for each cluster, 16 data points existed in relation to the tangible aspect of service encounters (4 *PC*s $\times$ 4 statements), allowing an in-depth examination of customers' cognitions.

Second, an intermediate degree of focus is also possible by looking at the average similarity ratings of the *PC*s for each reference statement. In the illustration, this *partially deconstructed view* showed how participants understood "Tangible" on the four reference statements defining that dimension.

Finally, the *aggregated view* represents the average similarity of the cognitive content of participants on the dimensions of the domain studied. This is the most synthetic view of segments' cognition. In Figure 5, the aggregated view of the results shows contrasting patterns across the clusters. For instance, clusters C ($n = 19$) and A ($n = 27$) do not focus their attention on "Tangible" issues during service encounters as their scores are the lowest on this dimension ($M_A = 2.98, M_C = 2.88$), whereas the score of cluster B ($n = 21$) is greater ($M_B = 3.94$ vs. $M_A = 2.98, t = 2.31, p = 0.02$; $M_B = 3.94$ vs. $M_C = 2.88, t = 2.72$, $p = 0.01$) but still lower than cluster D ($n = 19$), whose members exhibit the most concern for tangible elements ($M_D = 4.94$ vs. $M_B = 3.94$, $t = 2.20$, $p = 0.03$).

Clusters A and C display concerns for "Convenience" ($M_A = 3.70, M_C = 3.74$) as well as "Policy" ($M_A = 3.71$, $M_C = 3.81$). But cluster A exhibits more concern for the "Empathy" dimension at a marginally significant level ($M_A = 4.81$ vs. $M_C = 4.09$, $t = 1.91, p = 0.06$). Cluster D ($n = 19$) exhibits average similarity ratings across all ten dimensions having little variance (ranging from 4.42 to 4.94); however, as noted before, its rating for the "Tangible" dimension is the highest among all clusters. Cluster B is characterized by a pattern of ratings similar to cluster D, with much concern for the "Tangible" dimension, having the second highest score ($M_B = 3.94$).

Cognitive segmentation identifies groups of participants directly based on their cognitive content. It reveals what aspects of the product or service offering the different segments customers would be most receptive to, such as having empathic employees for cluster A or a strong focus on the physical elements of the service for cluster D. Even if two clusters appear similar on a dimension or fail to reach statistical significance on a seemingly differentiating dimension, it is necessary to go beyond the aggregated view in order to obtain a more accurate picture of the segments' cognitions.

The aggregated view shows that clusters B and D have similar ratings on the "Empathy" dimension ($M_B = 4.47$ vs. $M_D = 4.42$), but a closer look, using the partially deconstructed view, reveals a differing pattern of ratings across the reference statements. As shown in Table 1, the mean similarity rating of participants with the statement "individual attention" was 4.60 for cluster B compared to 4.12 for cluster D, while for the statement "understand specific needs" it was 4.61 for B compared to 3.99 for D. However, for the statement "easy to explain needs," this pattern was reversed, as cluster B's ratings were 4.35 compared to 4.87 for cluster D. Although these two clusters appear similar at the aggregated level, a more in-depth cognitive analysis reveals that they differ widely according to how they construe the notion of "Empathy." Compared to cluster D, cluster B sees "Empathy" more in terms of how much individual care is given by the service provider. On the other hand, cluster D sees "Empathy" more in terms of how easy it is to voice a request to the service provider.

Table 1. Partially Deconstructed View of Customers' Cognitive Content.

	Cluster A	Cluster B	Cluster C	Cluster D
Tangible				
1. Modern look of equipment—the equipment looks new, up to date, and contemporary.	2.56	3.56	2.70	4.96
2. Visual appeal of facilities—attractive, appealing, likable to the eye.	2.76	3.80	2.68	4.88
3. Neat appearance of employees—tidy, orderly, and organized appearance.	3.52	4.29	3.33	4.84
4. Visual appeal of materials (pamphlets or statements)—attractive, appealing, likable to the eye.	3.09	4.13	2.82	5.08
Reliability				
1. Promise to do something by a certain time—keep their word, punctual, service completed on time.	5.15	4.95	4.66	4.84
2. Sincere interest in solving problems—genuine concern for consumers; dealing with problems.	5.12	5.13	4.58	4.67
3. Performing the service right the first time—accurate service delivery.	5.26	4.94	4.53	4.39
4. Provide their service at the time promised—service provided in a timely manner.	5.19	4.75	4.30	4.79
5. Insist on error-free records—service provider will be accurate with billing, invoice, and work order statements.	4.78	4.67	4.11	4.13
Responsiveness				
1. Exactly when service will be performed—service provider will keep the consumer informed about time of service delivery.	5.21	4.86	4.49	4.36
2. Prompt service by employees—service employees will provide quick service to consumers.	5.33	4.75	4.64	4.57
3. Employees willing to help—employees are eager or enthusiastic to help consumers.	5.37	4.61	4.53	4.71
4. Employees never too busy—employees are always available to help consumers.	5.21	4.87	4.55	4.55
5. Waiting time—the service provider's ability to decrease time between each point in the service delivery process.	4.60	4.43	3.92	4.42
6. Timing of service delivery—the service provider delivered the service in the proper sequences.	4.47	4.79	4.04	4.72
7. Ability to make decisions—the employees have the power to make decisions in order to fulfill my requests.	4.61	4.60	3.74	4.49

(*Continued*)

Table 1. (Continued)

	Cluster A	Cluster B	Cluster C	Cluster D
6. Timing of service delivery—the service provider delivered the service in the proper sequences.	4.47	4.79	4.04	4.72
7. Ability to make decisions—the employees have the power to make decisions in order to fulfill my requests.	4.61	4.60	3.74	4.49
Assurance				
1. Behavior of employees will instill confidence—consumers will feel confident about service quality.	5.04	4.39	4.07	5.26
2. Will feel safe in their transaction—consumers will feel protected in the transaction.	4.06	4.30	4.01	4.63
3. Consistently courteous—employees will always be considerate of consumers.	4.91	4.68	4.22	4.91
4. Knowledge to answer questions—employees will have the information necessary to address questions.	4.94	4.81	4.16	4.34
Empathy				
1. Individual attention—service provider will take special notice of consumers.	4.82	**4.60**	4.36	**4.12**
2. Convenient operating hours—service provider will offer suitable operating hours to consumers.	4.10	4.35	3.89	4.26
3. Personal attention—employees will take personal interest in consumers.	4.94	4.24	4.25	4.45
4. Consumer's best interests at heart—service provider will be caring of consumer interests.	4.94	4.37	4.22	4.64
5. Understand specific needs of consumers—employees will appreciate specific wants of consumers.	4.79	**4.61**	4.03	**3.99**
6. Time to listen—the service employee takes a moment to understand my needs.	5.10	4.76	4.26	4.59
7. Easy to explain needs—the service employees make it easy for me to describe my requests.	4.97	**4.35**	3.59	**4.87**
Convenience				
1. Clean, attractive, and convenient public areas—consumers can easily access clean public areas.	3.16	4.24	3.09	4.84
2. Easy to find what you need—consumers can easily find what they need from the service provider.	3.81	4.45	3.84	4.63
3. Easy to move around—consumers are not obstructed to move around in the service provider's location.	3.09	4.12	3.39	4.07
4. Service availability—consumers can gain access to the service on demand.	4.48	4.63	4.21	4.42
5. Convenient access—consumers can easily gain access to the service provider (parking, online, telephone, and fax).	3.97	4.67	4.17	4.87

Personal interaction				
1. Attitudes of employees—the employees express positive attitudes toward consumers.	4.61	4.74	4.59	4.79
2. Reliability of technology—service provider uses reliable equipment (all machinery, computers, etc. that help to perform the service) in the service delivery.	4.94	4.75	4.21	4.78
3. Courteous treatment through media—service provider is polite during communication (phone, e-mail, fax, etc.).	3.56	4.63	3.96	4.76
Problem solving				
1. Handling consumer complaints—employees are able to address consumer complaints exactly and instantly.	4.79	4.49	4.25	4.61
2. Willingness to handle returns/exchanges—the service provider wants me to feel satisfied with the service or they refund my money back.	5.21	4.80	4.64	4.70
3. Helpfulness of employees—employees are supportive in the service delivery.	5.02	5.12	4.30	4.83
4. Helpfulness of service provider—the service provider is supportive in the service delivery.	5.00	4.94	4.46	4.54
Policy				
1. Accepts most major forms of payment—the service provider is willing to take most major credit cards, checks, or cash.	3.81	4.33	3.91	4.72
2. Alternative payment methods—the service provider provides the opportunity for financing.	3.62	4.30	3.71	4.30
Confidence				
1. Adequacy of explanation—the service provider described the service process prior to its delivery.	4.69	4.37	3.84	4.55
2. Adequacy of instruction—the service provider gave clear directions after the service delivery.	4.51	4.55	3.91	4.36
3. Ability to keep advertising promises—the service provider's ability to live up to its communications.	4.13	4.15	3.83	4.37

Table 2. Totally Deconstructed View for the Empathy Dimension.

Reference Statements	*PC*	Cluster A	Cluster B	Cluster C	Cluster D
Empathy					
Individual attention—service provider will take special notice of consumers.	1	5.00	4.33	4.42	4.89
	2	3.81	**4.86**	4.95	**3.42**
	3	5.00	**5.00**	3.37	**4.00**
	4	5.48	4.19	4.68	4.16
Convenient operating hours—service provider will offer suitable operating hours to consumers.	1	4.00	4.81	4.11	4.58
	2	3.78	3.95	4.32	3.21
	3	4.11	4.57	2.79	4.58
	4	4.52	4.05	4.37	4.68
Personal attention—employees will take personal interest in consumers.	1	4.78	4.05	4.84	5.00
	2	4.04	4.81	4.79	3.53
	3	5.41	4.62	2.89	4.32
	4	5.56	3.48	4.47	4.95
Consumer's best interests at heart—service provider will be caring of consumer interests.	1	4.81	4.43	4.42	5.05
	2	3.96	4.52	4.63	3.42
	3	5.81	5.00	3.26	4.74
	4	5.15	3.52	4.58	5.37
Understand specific needs of consumers—employees will appreciate specific wants of consumers.	1	4.81	4.43	4.00	4.58
	2	4.07	**5.29**	4.05	**3.11**
	3	5.26	**5.00**	3.26	**4.05**
	4	5.00	3.71	4.79	4.21
Time to listen—the service employee takes a moment to understand my needs.	1	5.00	4.95	4.68	4.63
	2	4.67	5.38	4.74	3.05
	3	5.44	4.43	3.00	5.42
	4	5.30	4.29	4.63	5.26
Easy to explain needs—the service employees make it easy for me to describe my requests.	1	5.59	**4.81**	4.05	**5.42**
	2	3.96	4.19	4.11	3.74
	3	5.22	**4.57**	2.26	**4.84**
	4	5.11	**3.81**	3.95	**5.47**

The totally deconstructed view further deepens this analysis. As shown in Table 2, the aforementioned conclusions concerning the focus on "individual attention" of cluster B is mostly due to its divergence with cluster D on only two *PC*s ($PC_2\ M_B = 4.86$ vs. $PC_2\ M_D = 3.42$; $PC_3\ M_B = 5.00$ vs. $PC_3\ M_D = 4.00$) as well as concerning the focus on "understanding specific needs" ($PC_2\ M_B = 5.29$ vs. $PC_2\ M_D = 3.11$; $PC_3\ M_B = 5.00$ vs. $PC_3\ M_D = 4.05$). However, these clusters converge rather than diverge according to one of their *PC*s for both the "individual attention" dimension ($PC_4\ M_B = 4.19$ vs. $PC_4\ M_D = 4.16$) and the "understand specific needs" dimension ($PC_1\ M_B = 4.43$ vs. $PC_1\ M_D = 4.58$). In addition, their opinions on the remaining *PC* are actually contrary to the mean tendency observed at the partially deconstructed level for both "individual attention" ($PC_1\ M_B = 4.33$ vs. $PC_1\ M_D = 4.89$) and "understand specific needs" ($PC_4\ M_B = 3.71$ vs. $PC_4\ M_D = 4.21$). Because the point of differentiation between clusters B and D is apparent at the partially deconstructed level but is not consistently found for all 4 *PC*s, "individual attention" and "understand specific needs" do not

appear to be viable differentiation points. The totally deconstructed view analysis of the statement related to the ease of explaining needs reveals a different picture. As shown in Table 2, only one *PC* contradicts the partially deconstructed view that cluster D focuses more on "easy to explain needs" than cluster B (PC_2 $M_B = 4.19$ vs. $PC_2 M_D = 3.74$), whereas all the other *PC*s support this analysis (PC_1 $M_B = 4.81$ vs. PC_1 $M_D = 5.42$; PC_3 $M_B = 4.57$ vs. PC_3 $M_D = 4.84$; PC_4 $M_B = 3.81$ vs. PC_4 $M_D = 5.47$). This suggests that the difference between clusters B and D in how they construe the notion of an empathetic service provider based on the ease of expressing their needs is robust. Here the totally deconstructed view gives greater insights into how to tailor appeals to various market segments. In today's business environment, with growing standardized offerings and increasing level of quality, cognitive segmentation can help in gaining a competitive edge by providing an in-depth understanding of customers' cognitions.

Step 8: Identifying the Substance and Unique Factors Underlying Participants' *PC*s

The discriminant capacity of participants is operationalized through their number of common *PC*s (i.e., how many cognitive categories they use) as well as the number of distinct cognitive dimensions on which their common *PC*s load (indicating the complementarity of their cognitive categories). Then, for every participant, the average number of common *PC*s per distinct cognitive dimension is multiplied by the total number of distinct cognitive dimensions to obtain a cognitive structure's discriminant capacity score. This operationalization takes into account the average level of granularity of the distinct cognitive dimensions (the number of common *PC*s per dimension) as well as the number of distinct dimensions in the respondent's *PC System*. It is based on the assumption that the level of granularity of the cognitive dimensions and the number of cognitive dimensions contribute equally to an individual's discriminating capacity. In other words, m cognitive dimensions with an average granularity of n equate to the same discriminating capacity as n cognitive dimensions with an average granularity level of m.

In order to assess the number of common *PC*s and the cognitive dimension they load on, it is necessary to identify what factors underly respondents' *PC System*s. First, exploratory factor analysis is conducted using all of the participants' *PC*s' intercorrelations to distinguish between substance and unique factors. According to Borman (1987), substance factors are widely shared among individuals (i.e., they have many high loadings of *PC*s coming from a diversified set of individuals), whereas unique factors are not common among individuals (i.e., they have only a few high loadings that come from a narrow pool of individuals). *PC*s loading on substance factors carry common inter-subjective meaning, whereas *PC*s loading on unique factors emerge as a result of idiosyncratic cognitions and cannot be interpreted (Borman, 1987). A *PC* loading on a substance factor (>0.4) is defined as common, whereas a *PC* loading on a unique factor or not loading on any factor is defined as idiosyncratic (Borman, 1987). The number of variables subjected to factor analysis is likely to be large (i.e., the total number of *PC*s elicited from the participants) and the sample size limited by the number of reference statements. Therefore, due to this unique matrix structure, the factors need to be extracted using unweighted least squares (Jöreskog, 1979).

The exploratory factor analysis with varimax rotation yielded a 15-factor solution (see Table 3). This was the most parsimonious solution that explained more than 60 percent of the common variance (Hair et al., 1998). Building from Borman (1987), it was reasoned that, in order to be determined as a "unique" factor, it had to have (1) high loadings (i.e., >0.4) from less than 10% of the total number of *PC*s factor analyzed ($630 \times 0.10 = 63$) and (2) loadings coming from less than 10% of the total number of participants (<8) or loadings concentrated among only a few individuals. (It shows they result from these respondents' idiosyncrasies.) This latter indicator was measured using a "factor versatility" ratio of the number of subjects from which high-loading *PC*s come from divided by the number of *PC*s. A higher ratio indicates that *PC*s tend to come from different subjects; hence, the factor is more versatile. Factors with high loadings of *PC*s coming from more than 10% of the respondents were deemed "unique" if their versatility was below 0.5. For instance, in Table 3, it is shown that factor 6 is "unique." This factor satisfies the first criterion because it has high loadings from only 24 *PC*s; however, it does not satisfy the number of respondents criterion because the *PC*s come from a fraction of subjects larger than 10% of the total (i.e., 10/86). However, due to a versatility below 0.5 (i.e., 0.42), this factor was categorized as "unique" because the *PC*s tended to concentrate on the same respondents. Factors that did not satisfy these criteria were categorized as "substance" because they explained the variance of a significant number of *PC*s that represented a diversified pool of participants. As shown in Table 3, 11 factors were deemed "substance" and 4 "unique."

Step 9: Computing the Discriminant Score of Participants' Cognitive Structures

Once the "unique" and "substantial" factors have been extracted, common and idiosyncratic *PC*s can be distinguished. Common *PC*s load highly on "substantial" factors, whereas "idiosyncratic" *PC*s load highly on "unique" factors. For each participant, the number of common *PC*s as well as the number of distinct cognitive dimensions they load on (i.e., substantial factors) is recorded, and the discriminating capacity of their *PC System* is computed. In the exceptional case where a *PC* loads highly on both a "unique" and a "substance" factor, the nature of the *PC* is established according to the factor on which its loading is the highest. If some clusters include participants who tend to have *PC System*s with low or high discriminant capacity, further insights can be drawn about the validity of the potential differentiation points found during step 7.

Table 4 shows the mean discriminating capacity by clusters. Respondents in cluster A exhibit a greater discriminant capacity than those in cluster D ($M_A = 6.00$ vs. $M_D = 3.89$, $t = 2.61$, $p = 0.01$). Remember that cluster D exhibited higher ratings than all the other clusters on the "Tangible" dimension. However, cognitive structure analysis shows the cluster's members have the lowest discriminating capacity. Therefore, respondents from cluster D might not be able to accurately perceive offerings well positioned on "Tangibles," making it an elusive target. On the other hand, cluster A was established as being a likely target by adopting an "Empathy" strategy. Cognitive structure analysis shows that this cluster's members are the most able to discriminate. In addition, the size of segment A can be assessed relative to the overall market (27/86) and provide managers with vital information regarding the potential of a strategy based on targeting these customers by adopting an "Empathy" positioning.

Table 3. Exploratory Factor Analysis Results for the Elicited *PC*s.

Factor	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Type	Sub-stance[a]	Sub-stance	Sub-stance	Sub-stance	Sub-stance	*Unique*[b]	Sub-stance	Sub-stance	Sub-stance	*Unique*	Sub-stance	Sub-stance	Sub-stance	*Unique*	*Unique*
# *PC*s[c]	149	140	55	45	24	*24*	22	18	22	*9*	13	14	12	*9*	*10*
# Subjects[d]	52	59	37	26	12	*10*	14	13	17	*4*	12	9	12	*5*	*8*
Versatility[e]	0.35	0.42	0.67	0.58	0.50	*0.42*	0.64	0.72	0.77	*0.44*	0.92	0.64	1.00	*0.56*	*0.80*

[a] Substance factors take their meaning from the content (e.g., definition) of the *PC*s loading on them, which carry common inter-subjective meaning.

[b] Unique factors are not interpretable because they result from individuals' idiosyncrasies and therefore represent artifactual rather than substantial factors.

[c] This number represents the total number of *PC*s loading highly (i.e., >0.4) on any of the factor extracted regardless of which subjects they were elicited from; a higher number indicates that the factor underlies many *PC*s in the database.

[d] This number represents the different subjects from which the highly loading *PC*s from the row above originate; a greater number indicates that the factor is common among many subjects' cognitions.

[e] This is the ratio of the number of subjects over the number of *PC*s; it indicates the extent to which the *PC*s loading on each of the extracted factors tend to be found among the same individuals; a greater number indicates the *PC*s come from a more diversified set of subjects. At the extreme, the number 1 shows that each *PC* loading on the factors comes from a different subject, which indicates a very versatile factor.

Table 4. Mean Discriminating Capacity by Segments.

Cluster A				Cluster B				Cluster C				Cluster D			
ID	# Common *PC*s	# Distinct Dimensions	Discriminant Capacity	ID	# Common *PC*s	# Distinct Dimensions	Discriminant Capacity	ID	# Common *PC*s	# Distinct Dimensions	Discriminant Capacity	ID	# Common *PC*s	# Distinct Dimensions	Discriminant Capacity
1	6	4	6	7	3	5	3	4	2	2	2	8	0	0	0
2	2	2	4	10	7	3	7	13	5	5	5	16	7	3	7
18	2	3	2	11	0	0	0	15	6	2	6	17	0	0	0
20	6	3	6	14	4	3	4	34	4	2	4	19	5	1	5
21	3	3	3	22	10	2	10	42	3	3	3	29	2	1	2
27	6	4	6	23	3	4	3	48	4	4	4	38	3	2	3
28	3	2	3	30	2	2	2	49	9	3	9	47	11	6	11
33	3	2	3	31	1	1	1	63	4	2	4	53	5	4	5
55	5	4	5	32	2	2	2	68	6	3	6	60	4	3	4
56	6	4	6	43	3	2	3	69	9	3	9	70	0	0	0
57	4	3	4	50	6	3	6	76	4	3	4	82	4	3	4
59	5	4	5	61	10	4	10	91	2	2	2	92	4	2	4
64	11	3	11	67	4	4	4	93	7	3	7	99	0	0	0
75	10	3	10	72	6	3	6	94	2	2	2	106	2	2	2
81	8	7	8	85	6	5	6	103	4	3	4	119	7	4	7
84	7	1	7	87	6	1	6	107	9	4	9	121	2	2	2
90	8	4	8	96	3	1	3	130	2	3	2	134	10	5	10
97	5	5	5	98	6	4	6	135	0	0	0	137	3	3	3
100	7	2	7	101	6	3	6	138	6	3	6	140	5	4	5
108	8	4	8	111	4	4	4								
116	8	4	8	126	9	2	9								
117	9	2	9												
123	5	5	5												
124	5	2	5												
128	8	4	8												
131	4	3	4												
133	6	2	6												
Discriminant Capacity			6.00[A]	Discriminant Capacity			4.81	Discriminant Capacity			4.63	Discriminant Capacity			3.89[A]

Note: Means with an "A" superscript are significantly different from one another at $\alpha = 0.05$. Discriminant Capacity = (# Common *PC*s/# Distinct Dimensions) × # Distinct Dimensions.

CONCLUSION

Based on customers' cognitive structure and content, cognitive segmentation allows researchers to collect insights from participants in their own language as well as to quantitatively transpose these insights by estimating how close their meanings are to a benchmark. On the one hand, idiographic methodologies paved the way in taking the viewpoint of the customer, while, on the other hand, demographic and psychographic techniques lent flexibility to segmentation. Cognitive segmentation extends these contributions by capturing cognitive content in operational terms. By doing so, cognitive segmentation melds the richness of qualitative research with the power of quantitative techniques, bridging the gap between the idiographic nature of knowledge at the individual level and the nomothetic approach to marketing applications. As demonstrated in our implementation, although content is quantitatively operationalized, the original depth of the qualitative data is still present when analyzing the segments. The aggregated view is synthetic, but the partially and totally deconstructed views offer insights at a granular level. Specifically, this allows for (1) a detailed analysis of each dimension of the domain investigated, and (2) further analysis of cognitions pertaining to a particular dimension of the domain. Thus, marketers can more precisely differentiate products or services and, at the same time, assess which points are most likely to represent a viable advantage based on the degree to which customer cognitions are consistent with the product offering. In addition, the integration of cognitive structure with content enriches the diagnostic by evaluating segments' discriminating capacity. The effectiveness of the content-based points of differentiation is reinforced when a target segment has high discriminating capacity. When used in conjunction with competitors' market positions, cognitive segmentation can offer valuable insights about which positioning is best to adopt.

As a research technique, cognitive segmentation functions in almost complete autonomy. The participants self-elicit cognitive content through the Rep Grid using their own stimuli; then they complete the trait implication matrix themselves. The later steps of the procedure are based on quantitative data, which minimizes researchers' impact on the outcome. This is a particularly important point since a recent study shows that experts' interpretations of participants' cognitive content diverge substantially from the participants' own interpretations (Braunsberger, Buckler, & Ortinau, 2005). To our knowledge, cognitive segmentation is the only elicitation technique that is participant-run. This implies that marketers would not necessarily need the expert skills of interviewers or qualitative researchers to use this technique.

Finally, cognitive segmentation accounts for participants' semantic particularities during the implementation. Each participant goes through cognitive segmentation by using his/her words that are most appropriate to discuss and describe the chosen context of study. This is a great benefit for managers who might want to identify segments in a new market where customers are still unfamiliar with the offerings. Cognitive segmentation would be able to overcome this limitation because participants self-generate their own anchors for ratings; therefore, a lack of knowledge among the participants about the domain investigated is not a limitation.

Note that insights offered by cognitive segmentation differ sharply with multiattribute models of attitude. The latter indicate how strongly an object is believed

to possess some attributes (e.g., Bass & Wilkie, 1973; Beckwith & Lehmann, 1976; Bettman, Capon, & Lutz, 1975), whereas the former indicates the degree of cognitive isomorphism with a semantic standard (i.e., reference statements). In addition, in multi-attribute modeling, attributes are common for all the respondents (e.g., Bettman, Capon, & Lutz, 1975; Lutz, 1986; Toy, 1975; Wilkie & Pessemier, 1973), and they represent properties of the evaluated object (e.g., Meyer & Sathi, 1985; Srinivasan, 1979). On the other hand, the aggregated view of cognitive segmentation is linked to an array of personalized *PC*s for each respondent, which encompasses both attribute-based and holistic (i.e., personal meaning) cognitive dimensions. A given segment based on multi-attribute modeling includes customers with seemingly homogeneous attitudes; however, this could be biased, as these customers' attitudes may not account for all the attributes relevant to their cognitive content, such as idiosyncratic and holistic dimensions.

Cognitive segmentation brings an operational component to the philosophy brought forth by the marketing concept that any marketing endeavor should stem from a consideration of the customer's viewpoint (e.g., Drucker, 1954; McKitterick, 1957). This is the premise of alternative-constructivism, a view that emphasizes the active role played by people in what they perceive of the natural world. Alternative-constructivism is the epistemological foundation of Kelly's personal construct theory. Cognitive segmentation accounts for the fact that consumers can construe the same reality differently, or they can construe different realities in the same way, depending on the perspective they adopt. Based on these premises, cognitive segmentation switches the active role of meaning construction from the researcher to the participants, in keeping with the tenets of the marketing concept.

LIMITATIONS AND FUTURE RESEARCH

While cognitive segmentation makes several contributions, some limitations should be highlighted. First, the generalizability of this technique may be called into question. Since cognitive segmentation's applicability was only tested in one domain (services), its generalizability across multiple domains cannot yet be fully determined.

In addition, cognitive segmentation still imposes some structure on participants. Although it gives more freedom in the choice of stimuli than other elicitation methods and enables individual semantics to be used, participants have to choose their stimuli from the domain under investigation. However, cognitive segmentation reduces participants' constraints relative to other techniques of cognitive content elicitation.

Future research areas can also be identified. First, further studies should more directly investigate the process of *PC* development. Kelly asserts that, after construing the anticipated event, *PC*s can be modified or new *PC*s can emerge. This raises an interesting question: At what point is the disconfirmation of *PC*s such that it will lead to the creation of new *PC*s rather than the modification of existing ones? This has important marketing implications because new *PC*s are likely to constitute new differentiation opportunities, whereas modified *PC*s are likely to change the viability of current differentiation points. Second, it would be important to investigate the extent to which *PC*s with

different foci of convenience are independent. Cognition tends to be seen as one large network and, therefore, *PC*s with different foci of convenience could influence each other. Third, given the single context of this study, researchers may want to investigate cognitive segmentation in other domains of inquiry. Finally, although the student participants could select relevant stimuli, further testing of cognitive segmentation with different populations is warranted to further gauge the applicability of this technique.

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APPENDIX

Reference Statements Used for the Trait Implication Procedure

Item	Dimension
Parasuraman, Berry, and Zeithaml (1991)	
1. Modern look of equipment—the equipment looks new, up to date, and contemporary.	Tangibles
2. Visual appeal of facilities—attractive, appealing, likable to the eye.	Tangibles
3. Neat appearance of employees—tidy, orderly, and organized appearance.	Tangibles
4. Visual appeal of materials (pamphlets or statements)—attractive, appealing, likable to the eye.	Tangibles
5. Promise to do something by a certain time—keep their word, punctual, service completed on time.	Reliability
6. Sincere interest in solving problems—genuine concern for consumers; dealing with problems.	Reliability
7. Performing the service right the first time—accurate service delivery from the first time.	Reliability
8. Provide their service at the time promised—service provided in a timely manner.	Reliability
9. Insist on error-free records—service provider will be accurate with billing, invoice, and work order statements.	Reliability
10. Exactly when service will be performed—service provider will keep the consumer informed about time of service delivery.	Responsiveness
11. Prompt service by employees—service employees will provide quick service to consumers.	Responsiveness
12. Employees willing to help—employees are eager or enthusiastic to help consumers.	Responsiveness
13. Employees never too busy—employees are always available to help consumers.	Responsiveness
14. Behavior of employees will instill confidence—consumers will feel confident about service quality.	Assurance
15. Will feel safe in their transaction—consumers will feel protected in the transaction.	Assurance
16. Consistently courteous—employees will always be considerate of consumers.	Assurance
17. Knowledge to answer questions—employees will have the information necessary to address questions.	Assurance
18. Individual attention—service provider will take special notice of consumers.	Empathy
19. Convenient operating hours—service provider will offer suitable operating hours to consumers.	Empathy
20. Personal attention—employees will take personal interest in consumers.	Empathy
21. Consumer's best interests at heart—service provider will be caring of consumer interests.	Empathy
22. Understand specific needs of consumers—employees will appreciate specific wants of consumers.	Empathy

(*Continued*)

APPENDIX (Continued)

Item	Dimension
Dabholkar, Thorpe, and Rentz (1996)	
23. Clean, attractive, and convenient public areas—consumers can easily access clean public areas.	Convenience
24. Easy to find what you need—consumers can easily find what they need from the service provider.	Convenience
25. Easy to move around—consumers are not obstructed to move around in the service provider's location.	Convenience
26. Service availability—consumers can gain access to the service on demand.	Convenience
27. Courteous treatment through media—service provider is polite during communication (phone, e-mail, fax, etc.).	Personal interaction
28. Willingness to handle returns/exchanges—the service provider wants me to feel satisfied with the service or they refund my money back.	Problem solving
29. Handling consumer complaints—employees are able to address consumer complaints exactly and instantly.	Problem solving
30. Convenient access—consumers can easily gain access to the service provider (parking, online, telephone, and fax).	Convenience
31. Accepts most major forms of payment—the service provider is willing to take most major credit cards, checks, or cash.	Policy
32. Alternative payment methods—the service provider provides the opportunity for financing.	Policy
Reid and Gundlach (1983)	
33. Helpfulness of employees—employees are supportive in the service delivery.	Problem solving
34. Helpfulness of service provider—the service provider is supportive in the service delivery.	Problem solving
Reidenbach and Sandifer-Smallwood (1990)	
35. Adequacy of explanation—the service provider described the service process prior to its delivery.	Confidence
36. Adequacy of instruction—the service provider gave clear directions after the service delivery.	Confidence
37. Ability to keep advertising promises—the service provider's ability to live up to its communications.	Confidence
38. Waiting time—the service provider's ability to decrease time between each point in the service delivery process.	Responsiveness
39. Timing of service delivery—the service provider delivered the service in the proper sequences.	Responsiveness
Aldlaigan and Buttle (2002)	
40. Time to listen—the service employee takes a moment to understand my needs.	Empathy
41. Easy to explain needs—the service employees make it easy for me to describe my requests.	Empathy
42. Ability to make decisions—the employees have the power to make decisions in order to fulfill my requests.	Responsiveness
43. Attitudes of employees—the employees express positive attitudes toward consumers.	Personal interaction
44. Reliability of technology—service provider uses reliable equipment (all machinery, computers, etc. that help to perform the service) in the service delivery.	Personal interaction