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Understanding brand equity involves identifying the network of strong, favorable, and unique brand associations in memory. This article introduces a methodology, Brand Concept Maps, for eliciting brand association networks (maps) from consumers and aggregating individual maps into a consensus map of the brand. Consensus brand maps include the core brand associations that define the brand's image and show which brand associations are linked directly to the brand, which associations are linked indirectly to the brand, and which associations are grouped together. Two studies illustrate the Brand Concept Maps methodology and provide evidence of its reliability and validity.

Brand Concept Maps: A Methodology for Identifying Brand Association Networks

Understanding brand equity involves identifying the network of strong, favorable, and unique brand associations in consumer memory (Keller 1993). Consumers might associate a brand with a particular attribute or feature, usage situation, product spokesperson, or logo. These associations are typically viewed as being organized in a network in a manner consistent with associative network models of memory (see Anderson 1983). This association network constitutes a brand's image, identifies the brand's uniqueness and value to consumers, and suggests ways that the brand's equity can be leveraged in the marketplace (Aaker 1996).

Ideally, firms should be able to measure this network of brand associations to obtain a brand map, such as the one for McDonald's in Figure 1. This map not only identifies important brand associations but also conveys how these associations are connected to the brand and to one another. First, the map pinpoints several associations that are connected directly to the McDonald's brand, such as "service" and "value," and therefore are more closely tied to the brand's meaning. Second, the map shows how other associations are connected to these close brand associations. For example, "hassle-free," "convenient," and "fast" are connected to the "service" association. Third, the map shows additional linkages between associations. For example, several core associations—"meals," "value," and "service"—are connected to one another but are not connected to other core associations, such as "social involvement."

However, methodologies for producing brand maps have been slow to emerge. Many methods are available for eliciting brand associations from consumers, ranging from qualitative techniques, such as collages and focus groups, to quantitative methods, such as attribute rating scales and brand personality inventories. Techniques such as multidimensional scaling are helpful in understanding how brands are viewed and what dimensions underlie these perceptions, but these techniques do not identify brand association networks—that is, which associations are linked directly to the brand, which associations are indirectly linked to the brand through other associations, and which associations are grouped together.

Two categories of techniques that differ in the way they derive brand maps are promising in this regard. The first, which we refer to as "consumer mapping," elicits brand maps directly from consumers. Brand associations are elicited from consumers, who are then asked to construct networks of these associations as links to the brand and to one another. Illustrative of this approach is Zaltman's Metaphor Elicitation Technique (ZMET), which uses qualitative research techniques to identify key brand associations and then uses in-depth interviews with respondents to uncover the links between these brand associations (Zaltman and Coulter 1995). The second category of techniques, which we refer to as "analytical mapping," produces brand maps using analytical methods. Brand associations are

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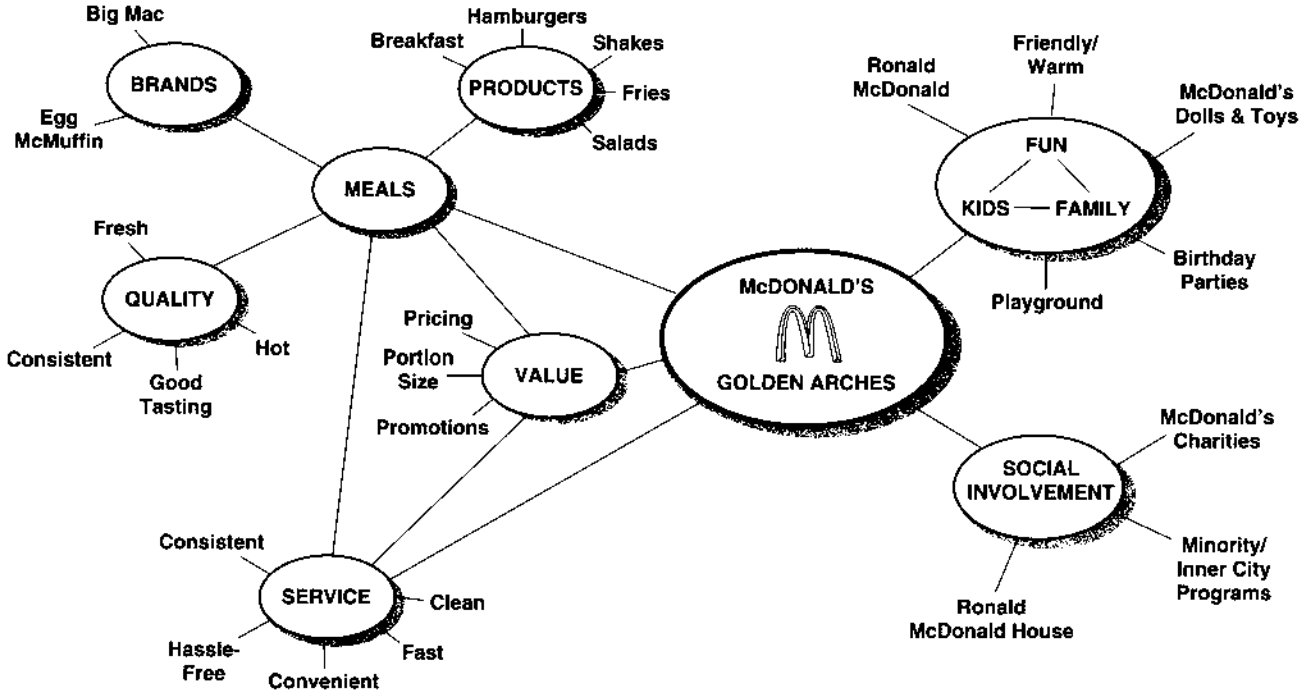
Figure 1
BRAND MAP FOR MCDONALD'S



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elicited from consumers, but analytical methods are used to uncover the network of brand associations. Illustrative of this approach is network analysis, which uses consumer perceptions about brands and derives the structure of brand associations through network algorithms (see Henderson, Iacobucci, and Calder 1998).

Despite these developments, barriers remain in making brand-mapping techniques more accessible to marketing practitioners. In consumer mapping approaches, the process of eliciting brand maps from individual consumers and aggregating these individual maps into a consensus brand map can be labor intensive and require specialized expertise. For example, ZMET requires the use of lengthy personal interviews conducted by interviewers trained in several base disciplines, such as cognitive neuroscience and psycholinguistics. Analytical mapping techniques offer a less labor-intensive process for generating maps through the use of quantitative analyses, but such techniques require knowledge of statistical techniques that are unfamiliar to most marketing researchers. For example, network analysis is a well-known technique in sociology, but it is unfamiliar to most marketing research firms.

In this article, we offer a new consumer mapping approach, called Brand Concept Maps (BCM), to answer the need for a more accessible and standardized method for producing brand maps. Our approach is easier to administer than existing consumer mapping techniques, such as ZMET, and does not require specially trained interviewers and large time commitments from respondents. In addition, the BCM offers a flexible approach that is capable of being used in many research settings, even with large sample sizes that cover diverse market segments. Compared with existing analytical mapping techniques, such as network analysis, our approach offers a standardized approach for aggregating individual brand maps using a relatively straightforward set of rules that do not require knowledge of specialized statistical techniques.

The remainder of the article proceeds as follows: We begin by providing more background on consumer mapping methods and describe ZMET and BCM in detail. Next, we discuss the first study; we describe the BCM methodology, illustrate its application, and provide evidence of its reliability (split-half reliability) and validity (nomological validity). We then present a second study that provides evidence of convergent validity, comparing results from the BCM technique with more conventional ways of measuring brand perceptions. In the final section, we evaluate the strengths and weaknesses of the BCM approach as well as its usefulness for brand management.

CONSUMER MAPPING TECHNIQUES

Consumer mapping techniques can be described in terms of three stages. The first is the elicitation stage, in which important brand associations are elicited from consumers. In the second stage, consumers map these elicited associations to show how they are connected to one another and to

the brand. In the third stage, researchers aggregate these individual brand maps and associated data to produce a consensus brand map.

In this section, we describe how these stages are accomplished in the most well-known consumer mapping technique, ZMET, and in our technique, BCM. We also evaluate each technique in terms of criteria that are important across many branding applications: ease of administration, flexibility across research settings, and quality of the obtained data in terms of reliability and validity.

ZMET

Description. Zaltman's Metaphor Elicitation Technique is designed to "surface the mental models that drive consumer thinking and behavior" (Zaltman and Coulter 1995, p. 36). It can be used for understanding consumers' thoughts about brands and product categories (Zaltman and Coulter 1995).

In the elicitation stage, a small number of participants, typically 20–25, are recruited and introduced to the topic of the study (brand). Participants are then given instructions to take photographs and/or collect a minimum of 12 pictures of images that will convey their thoughts and feelings about the topic. Seven to ten days later, participants return with the requested materials and engage in a two-hour personal interview to elicit constructs. The personal interview uses qualitative techniques that tap verbal constructs, such as Kelly's repertory grid (respondents identify how any two of three randomly selected pictures are similar but different from a third stimulus) and laddering exercises (respondents specify a means–end chain that consists of attributes, consequences, and values). The interviews also include several activities aimed at eliciting visual images that represent the topic of interest. Interviewers are specially trained in these elicitation techniques and are familiar with base disciplines (e.g., cognitive neuroscience, psycholinguistics, semiotics) underlying ZMET.

This is followed by the mapping stage, in which participants create a map or visual montage using the constructs that have been elicited. The interviewer reviews all the constructs that have been elicited with the respondent and then asks him or her to create a map that illustrates the important connections among important constructs.

In the aggregation stage, researchers construct a consensus map that shows the most important constructs and their relationships across respondents. Interview transcripts, audiotapes, images, and interviewers' notes are examined for the presence of constructs and construct pairs (two constructs that are related in some manner). After coding these data, the researchers make decisions about which constructs and construct relationships to include in the consensus map based on how frequently they are mentioned across respondents. The final map contains the chosen elements with arrows to represent links between constructs.

Evaluation. The primary advantage of ZMET is the thoroughness of the procedures for eliciting brand associations; it uses multiple qualitative research techniques to tap verbal and nonverbal aspects of consumer thinking. Eliciting brand associations in this manner is well suited to situations in which prior branding research is limited or in which deeper and unconscious aspects of a brand need to be better understood (Christensen and Olson 2002). Reliability and validity also seem promising. On the basis of validations with survey data, Zaltman (1997) reports that constructs elicited using ZMET generalize to larger populations, though the validity of relationships between constructs (associations) in consensus maps is still at issue (Zaltman 1997).

The most significant drawbacks of ZMET are related to accessibility and ease of administration. Accessibility to practitioners is limited because the procedures for producing brand maps are not standardized and involve expert judgment. The technique is also difficult to administer, and the process is labor intensive (Zaltman 1997). Respondents must be willing to undergo two interview sessions and devote additional time to prepare pictures and images for those interviews. Interviewers with specialized training determine the composition of the consensus maps through time-consuming reviews of interview materials. These requirements limit the flexibility of using ZMET across research settings, such as focus groups and mall-intercept studies. In addition, because the elicitation, mapping, and aggregation stages are so intertwined, ZMET offers little flexibility for firms with extensive prior brand research that already know the associations consumers connect to their brand but want to understand how these associations are structured in the form of a brand map.

BCM

Background. The BCM methodology is based on a family of measurement techniques called concept maps. Concept maps have been used for more than 20 years in the physical sciences to elicit knowledge people possess about scientific concepts and how they are interrelated to one another (Novak and Gowin 1984). Procedures for obtaining concept maps are flexible, ranging from unstructured methods, in which respondents generate their own concepts and develop concept maps with few instructions, to structured methods, in which lists of concepts are provided and concept mapping proceeds with the aid of explicit instructions and concept map examples (for a review, see Ruiz-Primo and Shavelson 1996). Recently, Joiner (1998) used an unstructured form of concept mapping to obtain brand maps from individual consumers. Participants were given a brief set of instructions, including an example concept map, and were asked to generate a concept map for a brand by thinking about the things they associated with the brand and drawing lines between these associations to show how they were connected.

However, existing work on concept maps does not offer procedures for aggregating individual maps into consensus maps. Individual concept maps obtained using unstructured methods present many of the same difficulties as those that ZMET poses. Therefore, procedures for obtaining individual maps need to be designed with aggregation in mind. To do so, the BCM incorporates structure into the elicitation, mapping, and aggregation stages of concept mapping, as we describe subsequently.

Description. The BCM method provides a map showing the network of salient brand associations that underlie consumer perceptions of brands. In the elicitation stage, researchers identify salient associations for the brand. Existing consumer research can be used for this purpose, or

a brief survey can provide the necessary information. The process for identifying salient associations should conform to four criteria, guided by procedures for obtaining salient beliefs in attitude research (e.g., Fishbein and Ajzen 1975).[1] First, data used to identify salient associations should be gathered from the same consumer population as the one being used in the mapping stage. Second, data used to identify salient associations should be based on consumer responses to open-ended questions (e.g., "When you think of [brand], what comes to mind?"). Open-ended questions allow consumers to voice whatever brand associations are most accessible and important to them in their own words. Third, the most frequently mentioned brand associations should be selected to form the final set. For our procedure, we include brand associations that at least 50% of respondents mentioned. Fourth, in selecting the exact phrasing for salient brand associations, it is important to retain wording that the consumers use rather than wording that researchers or managers more commonly use.

To begin the mapping stage, respondents are asked to think about what they associate with the brand. Salient brand associations (selected from the first stage) mounted onto cards are shown to respondents to aid in this process. Respondents are asked to select any of the premade cards that reflect their feelings about the brand. As a check to ensure that all salient brand associations have been included on the cards, blank cards are made available for respondents who want to add additional associations to the set. Then, respondents are shown an example of a BCM and are given instructions on building their own brand map. Respondents use the brand associations they have selected and connect them to one another and to the brand, using another set of cards with different types of lines (single, double, or triple) to signify the strength of the connection between associations.

In the aggregation stage, individual brand maps are combined on the basis of a set of rules to obtain a consensus map for the brand. As we describe subsequently, these rules require no specialized knowledge of quantitative or qualitative research methods. Frequencies are used to construct a consensus map, showing the most salient brand associations and their interconnections.

Evaluation. The BCM method incorporates structure into the elicitation, mapping, and aggregation stages to provide a technique that is easier to administer and analyze. Interviewers need minimal training, and respondents can complete the mapping procedure in a relatively short time (15–20 minutes). The BCM method also provides flexibility. Prior consumer research can often be used in the elicitation stage, enabling researchers to proceed with the mapping and aggregation stages without further time and expense. Respondents can complete brand maps relatively quickly, making the technique suitable for many data collection settings and affording the opportunity to collect larger samples than ZMET. This, along with more standardized aggregation procedures, enables firms to collect brand maps for different market segments or geographic areas.

However, the BCM has drawbacks as well. In most cases, the BCM reveals accessible brand associations and connections. However, associations that require more in-depth probing are unlikely to surface with this technique. Most of the representations are verbal in nature as well. Furthermore, the reliability and validity of consensus brand maps using BCM requires examination. Although individual concept maps may be valid, consensus maps pose additional challenges, particularly with regard to aggregation bias that can adversely affect reliability and validity.

We address these issues in Study 1. We illustrate the use of the BCM in a real branding context and provide additional details about the elicitation, mapping, and aggregation procedures. We also evaluate reliability and validity for the BCM methodology.

STUDY 1

In this study, we illustrate the use of the BCM in the context of a premier health care brand, the Mayo Clinic. This afforded us several opportunities to test the capabilities of the BCM technique. First, the Mayo Clinic is a complex brand with many salient brand associations, such as "leader in medical research," "best doctors in the world," and "known worldwide." This complexity provided a strong test of the BCM because large numbers of brand associations can be combined in almost infinite ways in a network structure, making it difficult to obtain a consensus brand map. Second, the Mayo Clinic brand elicits a wide variety of associations, including attributes (e.g., "best doctors in the world"), personality traits (e.g., "caring and compassionate"), and emotions (e.g., "it comforts me knowing that Mayo Clinic exists"). This provided an opportunity to test whether the BCM would be able to incorporate different types of associations into consensus brand maps. Finally, the Mayo Clinic is a brand with distinct user segments (patients versus nonpatients), which enabled us to test whether BCM would work equally well for users (who share experiences and similar brand associations) and nonusers (who are more heterogeneous and likely to have fewer brand associations in common).

Elicitation Stage

To begin, we selected a set of salient brand associations for the Mayo Clinic. First, we examined prior consumer research conducted by the Mayo Clinic, focusing our attention on responses to open-ended questions about the brand. We developed frequency counts of how often certain brand associations were mentioned, and we selected those that at least 50% of the respondents mentioned. We submitted these selections for review to the Mayo Clinic brand team, who added a few more associations of particular interest to them. We also consulted with members of the brand team to finalize the exact wording of the brand associations. The result was a set of 25 brand associations to be used in the mapping stage.

Mapping Stage

Sample. A total of 165 consumers from two midwestern cities participated in the study. Ninety participants were current or former patients at the Mayo Clinic. Patients were randomly selected from the Mayo Clinic database, sent a

[1]The BCM elicitation procedure differs from standard elicitation procedures in attitude research in at least two respects. First, the open-ended elicitation questions may differ somewhat from standardized elicitation questions about favorable and unfavorable attributes (or consequences) used in some attitude research (Fishbein and Ajzen 1975). Second, the number of associations used for the BCM procedure is typically larger than the ±7 rule used in some attitude research (Fishbein and Ajzen 1975).

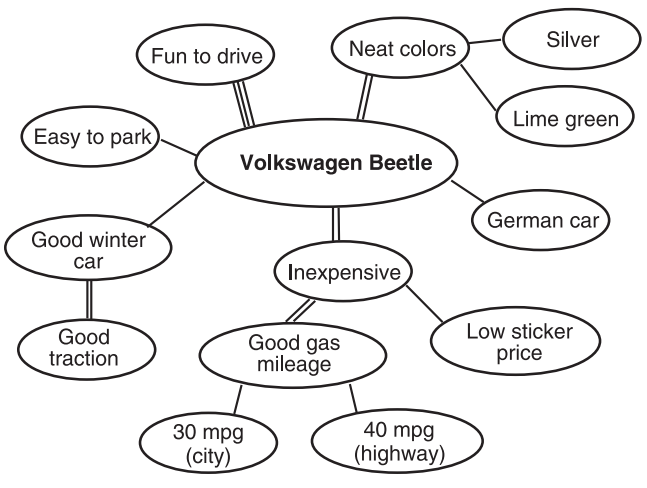
prenotification letter from the Mayo Clinic asking for their participation, and then recruited by telephone by marketing research firms in both cities. Seventy-five participants were nonpatients who were recruited and screened by marketing research firms. Age and gender quotas were used for both samples to obtain a broader set of respondents. All participants received monetary compensation for their participation.

Procedure. Marketing research firms in both cities conducted one-on-one interviews. Respondents were told that they were participating in a consumer study of health care organizations and had been chosen to answer questions about the Mayo Clinic. Respondents were encouraged to express their own opinions, whether positive or negative, and were told that the researchers were not employees of the Mayo Clinic.

Participants were guided in building their brand maps in four steps. First, participants were asked to think about the following question: "What comes to mind when you think about the Mayo Clinic?" To help them with this task, respondents were shown a poster board that contained 25 laminated cards, with a different brand association for the Mayo Clinic printed on each card. Respondents were told that they could use any of the cards on the poster board and could add additional thoughts or feelings by writing them down on blank laminated cards provided. All the chosen cards were put onto a second poster board to complete this step.

The second step involved explaining the nature and purpose of the BCM. Respondents were shown a BCM of the Volkswagen Beetle (see Figure 2). This example was used to describe the types of associations that might be included on the map, how associations might be linked to the brand (directly linked, such as "inexpensive to drive," or indirectly linked, such as "good mpg [miles per gallon]"), and how associations might be linked to one another (e.g., "good mpg" causes a Volkswagen to be "inexpensive to drive"). The Volkswagen Beetle map also included different types of lines that connected associations—specifically, single, double, or triple lines. Participants were told that these lines indicated how strongly an association was connected to the brand or to another association, with more lines indicating a stronger connection.

Figure 2
BCM EXAMPLE



Third, respondents developed their brand map for the Mayo Clinic. Participants were given a blank poster board, with the brand (Mayo Clinic) in the center. They were instructed to use the laminated cards they had previously selected and were given different types of lines (single, double, or triple) for connecting the laminated cards on their poster board. Respondents had as much time as they needed and were allowed to look at the Volkswagen Beetle example for reference.

In the fourth step, participants were asked to indicate their feelings about the brand using a number between 1 ("extremely negative") and 10 ("extremely positive"), which was then marked on the brand map next to the Mayo Clinic name. Participants completed several questions about prior experience and familiarity with the Mayo Clinic as well as basic demographics. Respondents were then thanked, debriefed about the study, and dismissed. On average, respondents completed the entire brand concept mapping procedure in 15–25 minutes.

Aggregation Stage

Measures. We first coded information from each respondent's map in terms of (1) the presence of each of the 25 brand associations, (2) the type of line (single, double, or triple) connecting each association to the brand or to another association, (3) the level at which each association was placed on the map (e.g., Level 1 = connected to brand, Level 2 = connected under a Level 1 association), and (4) which brand associations were linked above and below each association on the map. At this point, we also analyzed brand associations that the respondents added during the mapping procedure to determine whether any occurred frequently enough to be added to the original set. None were mentioned by more than 4% of respondents, so we excluded them from further analysis. However, we maintained a list of added associations in case they represented emerging perceptions of the brand that deserve further management attention.

We aggregated the coded data to obtain several measures for constructing the consensus brand map. Measures for the patient sample appear in Table 1. "Frequency of mention" is the number of times that a brand association occurs across maps. In Table 1, "expert in treating serious illnesses" was the most frequently mentioned association. "Number of interconnections" represents the number of times that a brand association is connected to other brand associations. The belief and attitude structure literature often views interconnectivity as indicative of how "central" an element is within an overall belief system (Eagly and Chaiken 1993; Rokeach 1968). In Table 1, "expert in treating serious illnesses" had the most interconnections to other brand associations. Frequently mentioned associations with many interconnections are the strongest candidates for being chosen as "core" brand associations on the consensus brand map.

The next three measures in Table 1 indicate where core brand associations should be placed on the consensus brand map, linked directly or indirectly to the brand. "Frequency

Table 1
STUDY 1: BCM MEASURES FOR PATIENTS

	Core Associations		*First-Order Associations*			
Brand Associations	*Frequency of Mention*	*Number of Inter-connections*	*Frequency of First-Order Mention*	*Ratio of First-Order Mention (%)*	*Subordinate Connections*	*Super-ordinate Connections*
Expert in treating serious illnesses	64	75	34	53.1	30	45
Latest medical equipment and technology	60	62	22	36.7	38	24
Leader in medical research	54	60	41	75.9	13	44
Known worldwide	54	57	37	68.5	17	27
Top-notch surgery and treatment	53	44	21	39.6	32	22
Best doctors in the world	51	54	29	56.9	22	52
World leader in new medical treatments	51	74	23	45.1	28	41
Can be trusted to do what's right for patients	51	69	22	43.1	29	25
Doctors work as a team	50	54	20	40.0	30	34
Best patient care available	49	64	33	67.3	16	45
Treats patients with rare and complex illnesses	49	61	23	46.9	26	18
Can figure out what's wrong when other doctors can't	49	44	15	30.6	35	22
Publishes health information to help you stay well	44	57	19	43.2	25	9
Approachable, friendly doctors	44	34	15	34.1	29	2
Caring and compassionate	42	50	19	45.2	23	19
Treats famous people from around the world	38	42	13	34.2	25	0
It comforts me knowing Mayo exists if I ever need it	36	25	19	52.8	18	15
People I know recommend Mayo	30	33	19	63.3	11	4
Leader in cancer research and treatment	29	15	11	37.9	18	5
Cares more about people than money	27	23	14	51.9	13	7
Court of last resort	12	20	5	41.7	7	1
Hard to get into unless very sick or famous	5	8	1	20.0	4	1
Very big and intimidating	3	5	3	100.0	0	4
Expensive	3	4	1	33.3	2	1
Uses its reputation to make money	3	3	1	.0	2	1

Notes: N = 90 respondents. Core brand associations are in bold, and first-order brand associations are in bold italics.

of first-order mentions" is a count of the number of times that a brand association is directly linked to the brand across maps. In Table 1, "leader in medical research" was the association most frequently connected in a direct way to the Mayo Clinic brand. "Ratio of first-order mentions" is the percentage of times that a brand association is linked directly to the brand when it is included on a brand map. According to Table 1, 75.9% of patients who included "leader in medical research" on their brand maps placed this association as a direct link to the Mayo Clinic brand. "Type of interconnections" indicates how frequently a brand association is placed above other associations (superordinate) or below other associations (subordinate) across maps. As Table 1 shows, patients frequently mentioned "latest medical equipment and technology" but placed it more in a subordinate position (38 maps) than in a superordinate position (24 maps). Associations linked directly to the brand on a frequent basis with more superordinate than subordinate connections are strong candidates for being directly connected to the brand in the consensus brand map.

Procedure. We used a five-step process to develop a consensus brand map for Mayo Clinic patients and nonpatients (see Table 2). In the first step, we identified the core brand associations that would be placed on the map. We used two measures for this purpose: frequency of mention and number of interconnections. We identified associations that were included on at least 50% of the maps as core brand associations, consistent with cutoff levels in content analyses of brand/product attributes, beliefs, and values (Reynolds and Gutman 1988; Sirsi, Ward, and Reingen 1996; Zaltman and Coulter 1995). We also included associations with borderline frequencies (45%–49%) if the number of interconnections was equal to or higher than that of other core brand associations, consistent with the idea that high interconnectivity signals the centrality of associations or beliefs. Applying these rules, we found 12 core brand associations for Mayo Clinic patients (see Table 1).

In the second step, we began the process of building the consensus map by identifying which core brand associations should be linked directly to the Mayo brand. We identified these core brand associations (first-order associations) using three measures: frequency of first-order mentions, ratio of first-order mentions, and type of interconnections. We selected associations with ratios of first-order mentions to total mentions of at least 50%, with more superordinate than subordinate connections, as first-order associations. Applying these rules to the patient data in Table 1, we selected six core brand associations as first-order associations, which appear as direct links to the Mayo Clinic brand in the consensus brand map (see Figure 3).

In the third step, we placed the remaining core brand associations on the map. They needed to be linked to at least one of the first-order brand associations; important links between the 12 core brand associations also needed to be placed on the consensus map. To do so, we first counted how frequently links between specific associations occurred across maps. We then compiled a frequency count of how many different association links were noted on one map, two maps, three maps, and so on. As we show in Figure 4, 109 different association links appeared on only one patient map, 42 different association links appeared on two patient maps, 24 different association links appeared on three patient maps, and so on. These frequencies represent links between associations in one direction only; the vast majority of possible association links (394 of a possible 600) never occurred on a single map.

Table 2
AGGREGATION RULES FOR BCM

Step	*Measures*	*Rules*
1. Select core brand associations	Frequency of mention Number of interconnections	Select brand associations that are •Included on at least 50% of maps. •Included on 45%–49% of maps if the number of connections the number of connections for core associations we identified previously.
2. Select first-order brand associations	Frequency of first-order mentions Ratio of first-order mentions Type of interconnections	Select core brand associations that •Have a ratio of first-order mentions to total mentions of at least 50%. •Have more superordinate than subordinate interconnections.
3. Select core brand association links	Frequencies for association links	Select core brand association links by •Finding inflection point on frequency plot. •Inflection point = target number. •Including all association links that appear on or above the target number of maps.
4. Select non–core brand association links	Frequencies for association links	Select non–core brand association links that are •Linked to a core brand association. •Linked on or above the target number of maps.
5. Select number of connecting lines	Mean number of lines used per link	Select single, double, or triple lines for each brand association link by •Determining the mean number of lines used per link. •Rounding up or down to the next integer number (e.g., 2.3 = 2).

We used these frequencies to select which association links would be included in the consensus map, looking for a sharp increase in frequency counts on the graphs (inflection point). In Figure 4, the inflection point occurs at five; the decision rule was to include all core association links found on at least five maps in the consensus brand map. Twenty-two links met the criteria, but only 12 of these were links between core brand associations; the remaining links were between core and non–core associations or between two non–core associations. We placed the 12 links between core brand associations on the consensus map to complete this step.

In the fourth step, we added important links between core and non–core brand associations to the consensus map. As we noted previously, several of the frequently mentioned links were between core and non–core brand associations. Although the consensus brand map could be restricted to core brand associations, it is often important for managers to see associations that drive consumer perceptions of the core brand associations. We added these links to the consensus map; we represented the non–core brand associations with dotted lines to distinguish them from the more important core brand associations.

In the fifth step, we placed lines (single, double, or triple) on the map to signify the intensity of the connection between associations. For each association link, we computed the mean number of lines respondents used and rounded up or down to the nearest integer (e.g., 2.3 = 2) to determine how many lines to use on the consensus brand map. For example, in the patient map, we decided to use a double line between "best patient care available" and "can be trusted to do what's right for patients" on the basis of the mean value of the number of lines (M = 2.1) that patients used to connect these two associations on their maps (see Figure 3).

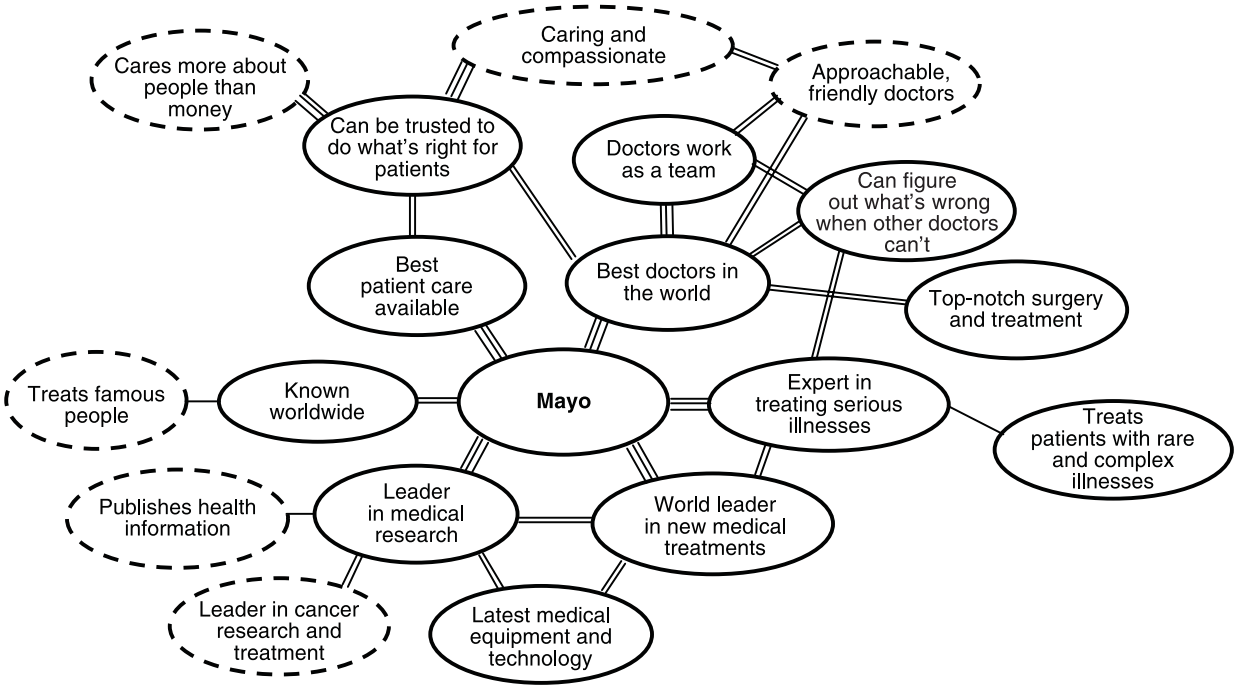
Consensus maps. The consensus brand maps for patients and nonpatients appear in Figure 3. As we expected, patients had consensus maps with more core brand associations, more first-order associations, more association links, and stronger connections between associations. Patients also included brand associations such as "caring and compassionate" and "cares more about people than money," which capture patient experiences. However, many core brand associations appeared across both patient and nonpatient maps. Associations such as "leader in medical research" and "known worldwide" are accessible to both groups through Mayo Clinic press releases, medical newsletters, and word of mouth.

How well do these consensus maps summarize the brand perceptions of patients and nonpatients? As a check on our aggregation procedures, we compared individual brand maps with consensus brand maps for patients and nonpatients in two ways. First, following a procedure used for ZMET, we determined the number of individual maps, selected at random, that was needed to capture at least 70% of all core brand association links found in the consensus maps for patients and nonpatients (see Zaltman and Coulter 1995). The logic here is that a small number of individual maps should be able to reproduce the association links in the consensus map if the aggregation procedure has been successful. In our case, it took 12 patient maps to reproduce at least 70% of the core brand association links found in the patient consensus map, and 7 nonpatient maps were needed to reproduce at least 70% of the core brand association links found in the nonpatient consensus map. Note that these numbers represent relatively small samples of individual maps from patients (13% of maps) and nonpatients (9% of maps).

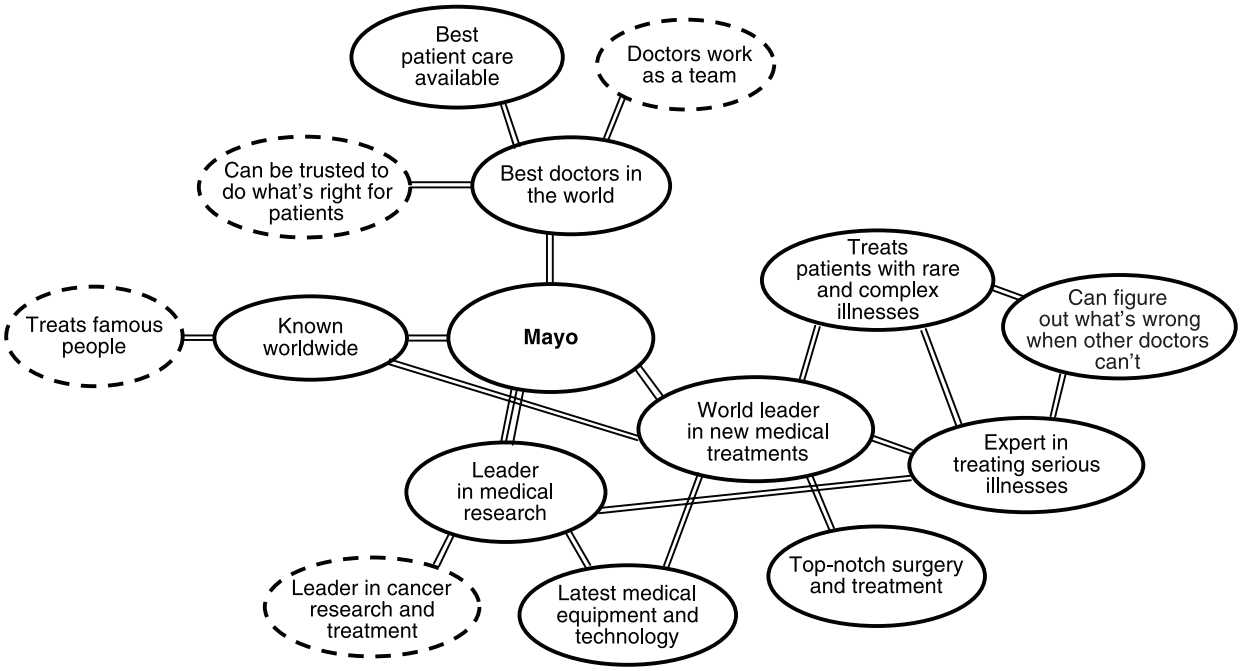
Second, we compared individual with consensus brand maps to determine how well the consensus maps captured the core brand associations found in individual brand maps. For example, if an individual's map includes 12 brand associations, how many of these are core brand associations found on the consensus map? For patients (nonpatients), we

Figure 3
STUDY 1: CONSENSUS BCM FOR MAYO CLINIC

A. Patients

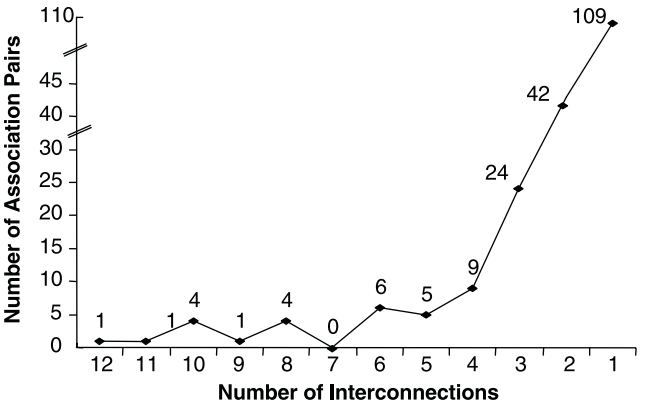


B. Nonpatients



Notes: N = 90 patients, and N = 75 nonpatients. The solid-line circle signifies core associations, and the dashed-line circle signifies non–core associations.

Figure 4
STUDY 1: ANALYSIS OF BRAND ASSOCIATION LINKS FOR PATIENTS



found that 66% (65%) of the brand associations shown on the individual maps were pictured as core brand associations on the consensus map. Furthermore, we checked on the intensity of the association links by weighting each brand association shown on an individual map by the number of lines (single, double, or triple) and attaching a valance to this number (+ = positive association; – = negative association). We then divided this number by a similar one that we computed for the core brand associations shown on the consensus maps. We found percentages similar to those for the unweighted analysis: 68% for patients and 68% for nonpatients. Taken together, these analyses indicate that consensus maps capture approximately two-thirds of the content of individual brand maps, which appears more than reasonable given the inherent heterogeneity of individual brand perceptions.

Reliability and Validity Analyses

The BCM method is able to capture the network of brand associations underlying consumer perceptions of a brand, as illustrated by the Mayo Clinic application, but does the BCM satisfy standard measurement criteria, such as reliability and validity? We pursued an answer to this question using traditional methods of measure validation (see Churchill 1979). We assessed split-half reliability to determine how consistent the obtained consensus brand maps would be across multiple administrations of the technique. We examined nomological validity by comparing consensus brand maps from known groups (expert versus novice consumers) to determine whether the maps reflect expected expert–novice differences. If so, these results would add to our confidence that the BCM measures what it purports to measure.

Split-half reliability. Using the patient sample, which we chose for its larger sample size, we randomly divided the individual concept maps into two halves. For each half, we aggregated individual brand maps into a consensus map. A comparison of the maps (see Figure 5) suggests a reasonable degree of consistency. Each map has 17 brand associations, with 16 associations shared across maps. The first map has 5 first-order associations, all connected to the Mayo Clinic brand with triple lines, except for a two-line connection with "known worldwide." The second map features the same first-order associations, connected by the same number of lines, though there is one additional association ("world leader in new medical treatments"). Many of the links between associations are the same as well.

To obtain quantitative measures of split-half reliability, we coded each split-half map for the presence or absence of (1) each of the 25 brand associations as a core association, (2) each of the 25 brand associations as a first-order association, and (3) each of the 300 possible links among the 25 brand associations. We coded presence of a brand association or association link as 1, and 0 otherwise. We then computed correlations across split-half maps, which were highest for the presence of core brand associations ($\phi = .92$, $p < .01$; N = 25), moderately high for the presence of first-order brand associations ($\phi = .78$, $p < .01$; N = 25), and moderate for the presence of specific brand association links ($\phi = .50$, $p < .01$; N = 300). Overall, the split-half reliability levels appear acceptable, even though the reliability of specific association links is considerably lower because of the sheer number of possible links and the conservative nature of the test, which credits only direct links between associations. For example, the "best doctors in the world" → "can figure out what's wrong when other doctors can't" link is coded as being present in Half 2 (Figure 5, Panel B) but not in Half 1 (Figure 5, Panel A), even though Half 1 contains the link embedded within a chain of associations ("best doctors in the world" → "doctors work as a team" → "can figure out what's wrong when other doctors can't").

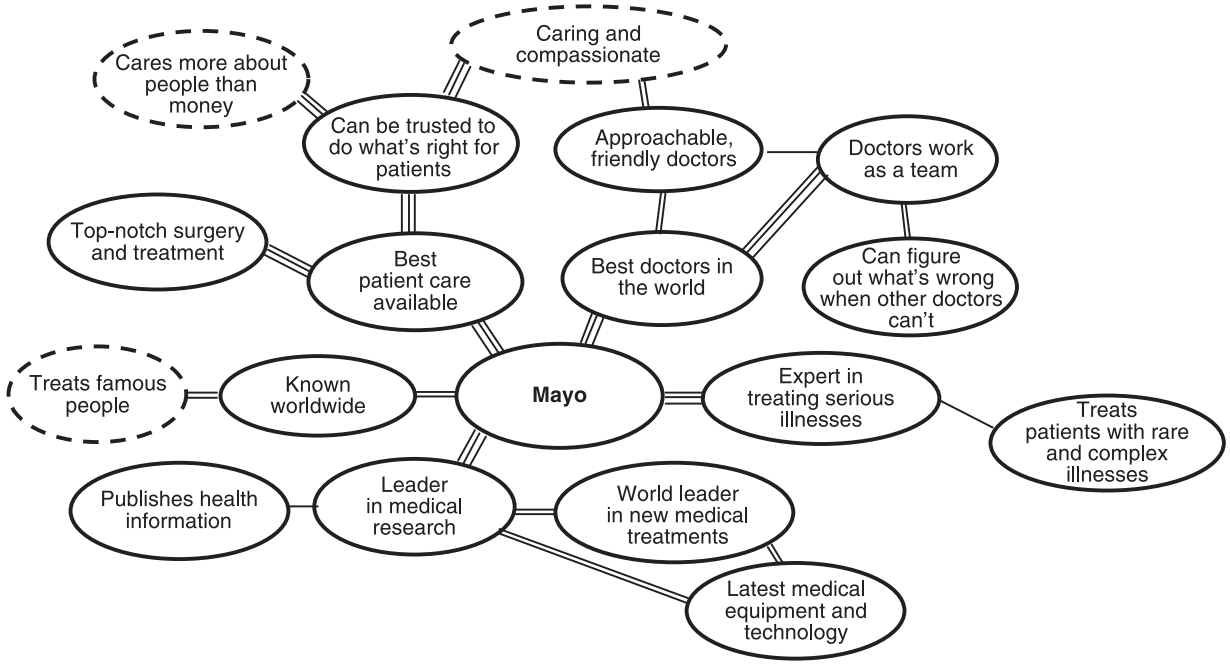
We conducted a second analysis to provide further data about the reliability of the brand association links shown in the consensus map. We coded each split-half map and the patient consensus map for the presence or absence of each of the 78 possible links between the 12 core beliefs and the Mayo Clinic brand.[2] We coded presence of a brand association link as 1, and 0 otherwise. We then computed correlations for each split-half map with the consensus map, showing a moderately high degree of reliability for the first split half ($\phi = .75$, $p < .01$; N = 78) and the second split half ($\phi = .78$, $p < .01$; N = 78). The correlation between split halves was moderate as before ($\phi = .54$, $p < .01$; N = 78). A similar analysis examining the strength of the association links (single, double, or triple lines) between all 78 possible links indicated even higher correlations between the consensus map and Half 1 ($r = .75$, $p < .01$; N = 78), the consensus map and Half 2 ($r = .84$, $p < .01$; N = 78), and both split halves ($r = .64$, $p < .01$; N = 78). Using the correlations between each split half and the consensus map as an indicator of reliability, we obtained a coefficient alpha of .70 for the presence of association links and .78 for the strength of association links, both meeting acceptable levels of reliability.

Nomological validity. We used a known-groups approach for assessing nomological validity, comparing consensus

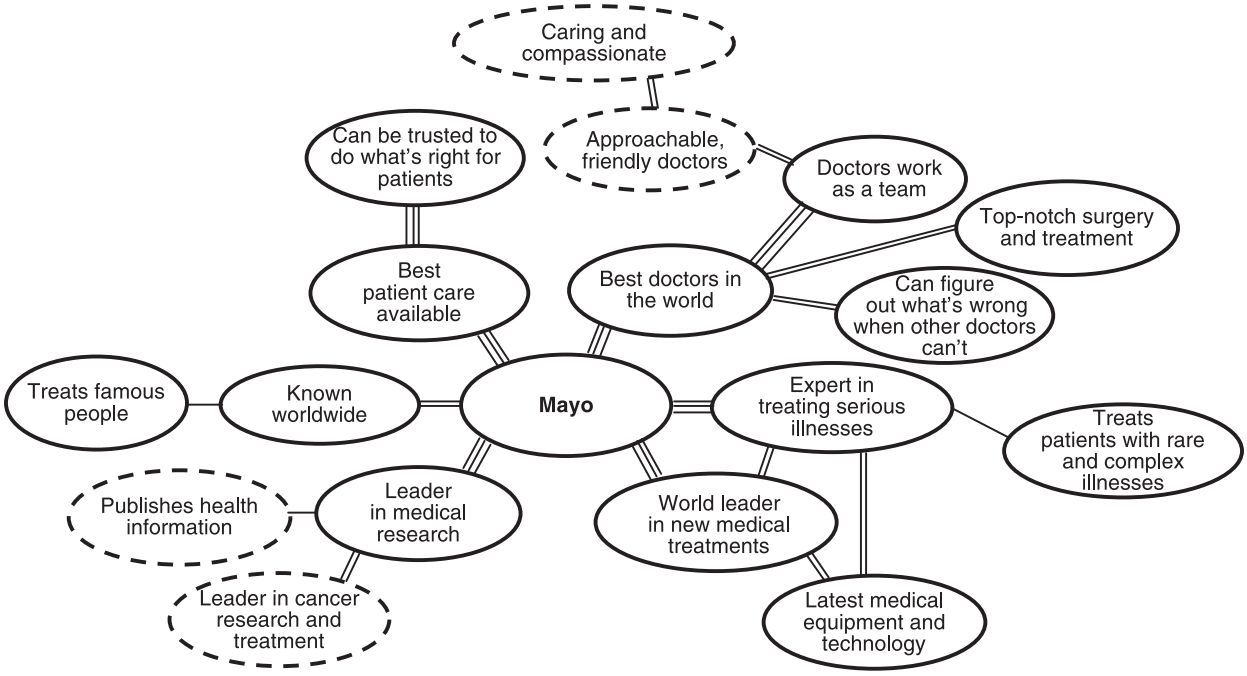
[2]Each core belief can be linked to any of the other 11 core beliefs or to the Mayo Clinic brand. For example, possible links for Core Belief 1 are 1–2, 1–3, 1–4, 1–5, 1–6, 1–7, 1–8, 1–9, 1–10, 1–11, 1–12, and 1–Mayo; additional possible links for Core Belief 2 are 2–3, 2–4, 2–5, 2–6, 2–7, 2–8, 2–9, 2–10, 2–11, 2–12, and 2–Mayo. Counting the number of nonduplicated links in this way results in 78 links.

Figure 5
STUDY 1: CONSENSUS BCM FOR SPLIT HALVES

A. Half 1



B. Half 2



Notes: N = 45 patients per each half. The solid-line circle signifies core associations, and the dashed-line circle signifies non–core associations.

brand maps for respondents who differed in familiarity with the Mayo Clinic. Because familiarity is a dimension of expertise, we expected to find several expert–novice differences in our comparisons. Experts typically have knowledge structures that are more complex and highly integrated, which would translate into more brand associations, more brand association links, stronger brand association links (e.g., more double and triple lines), and greater hierarchical structuring (e.g., more third- or fourth-order associations) in a consensus map (see Novak and Gowin 1984). Because familiarity can breed stronger feelings and emotions, we also expected experts to have more brand associations with relationship connotations, such as "caring and compassionate" and "can be trusted to do what's right for patients."

We divided respondents into two groups: very familiar and somewhat familiar. As we expected, the vast majority of patients (81%) were very familiar, but a substantial percentage of nonpatients (21%) also considered themselves very familiar. Many nonpatients knew someone who had been treated at the Mayo Clinic and could possibly have been involved in their treatment. The majority of nonpatients (56%) and a sizable number of patients (17%) identified themselves as being somewhat familiar. To obtain reasonable sample sizes for analysis, we limited our analysis to the "very familiar" and "somewhat familiar" groups.

To assess whether the BCM was capable of picking up expert–novice differences, we conducted two types of analysis. First, we used our aggregation procedures to produce a consensus brand map for both familiarity groups (see Figure 6). A comparison of these maps shows that the map for the very familiar group has a more complex structure, with more brand associations and more interconnections between associations.

We performed a second analysis to determine whether these findings could be corroborated with the BCM at the individual level. This also provided a check on our aggregation procedures, evaluating whether expert–novice differences found in the composite brand maps were reflective of expert–novice differences in individual brand maps. For this analysis, we coded each respondent's brand map for the following features: (1) number of brand associations; (2) number of brand associations at the first, second, third, and fourth+ levels; (3) number of relationship brand associations; (4) number of links between brand associations; and (5) number of single, double, and triple lines. Measures similar to these have been used in the concept mapping literature to evaluate the structural complexity of knowledge structures (see Novak and Gowin 1984) and to examine differences between groups that vary in expertise, instruction, or performance (see, e.g., Joiner 1998; Wallace and Mintzes 1990).

Means and standard deviations for both familiarity groups appear in Table 3. An analysis of variance revealed that the very familiar group had brand maps with more brand associations, more relationship associations, more brand association links, stronger brand association links (a greater number of triple lines), and more hierarchical branching (more third-level links). Thus, the expert–novice findings from this analysis converge with those we obtained using the consensus brand maps. The expected expert–novice differences emerge clearly, providing evidence of nomological validity and evidence that the consensus brand maps capture the essence of individual maps without noticeable aggregation bias.

Discussion

In this study, we illustrated the use of the BCM in an actual branding application. We also obtained evidence of reliability and validity, increasing our confidence that the BCM yields consensus brand maps that are valid depictions of the consumer brand perceptions.

An important question at this point is whether the BCM has predictive validity as well. Do individual brand maps predict a consumer's attitude toward the brand? Do features of the consensus brand maps predict overall attitudes toward the brand? Recall that our mapping procedure includes a ten-point attitude scale that can be used for tests of predictive validity. In our case, attitudes toward the Mayo Clinic were extremely positive across participants, hampering our ability to perform a full range of predictive validity analyses. However, we were able to demonstrate the predictive validity of individual brand maps through a simple cluster analysis. Using cluster analysis, we identified two groups of individuals with similar brand associations on their maps ($n_{cluster1} = 97$, $n_{cluster2} = 68$). Because these clusters view the brand in different ways, their brand attitudes should vary as well. Indeed, in comparing clusters on attitudes toward the Mayo Clinic, we found significant differences in attitudes ($M_{cluster1} = 8.90$, $M_{cluster2} = 9.69$; $t(1, 163) = 13.63$, $p < .01$).

Another question that can be raised is whether the BCM produces data that are consistent with more established research methodologies. Do features of the individual brand maps correlate well with results from standard survey research techniques? In the next study, we pursue evidence along these lines by assessing convergent validity. We compare consumer perceptions of the Mayo Clinic brand using the BCM and traditional attribute rating scales. Although the BCM is designed to capture the network of brand associations, which is beyond the purpose of attribute rating scales, there should nevertheless be some convergence between them. For example, if consumers agree strongly with the statement that the Mayo Clinic has the "best doctors in the world," this association should emerge as a core brand association in brand maps produced using the BCM.

STUDY 2

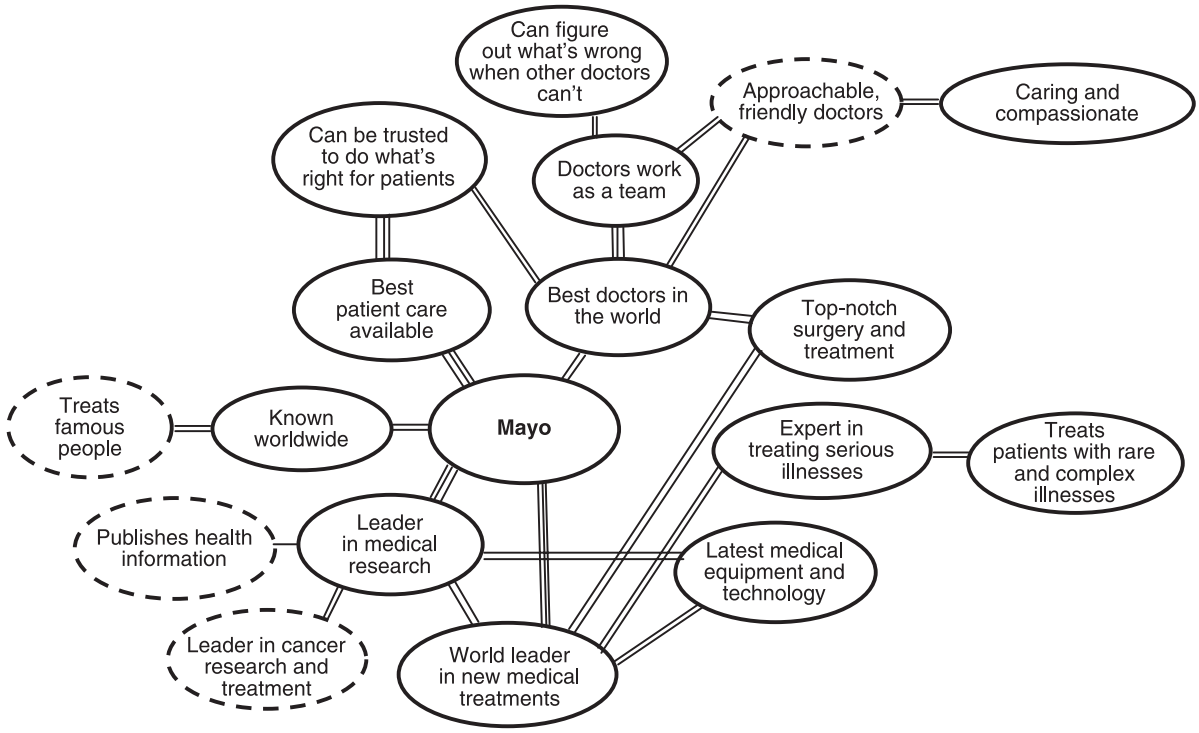
Method

Sample. A new sample of respondents was recruited for a mall-intercept study. Shoppers between the ages of 21 and 75 with at least a high school education, at least some familiarity with the Mayo Clinic, and no employment history with the Mayo Clinic were invited to participate for a $3 incentive. Quotas for age groups and gender were established to obtain a broader sample. Twenty-nine participants were asked about their perceptions of the Mayo Clinic using the BCM (BCM condition), and 20 participants provided their perceptions of the Mayo Clinic by answering a battery of attribute rating scales (attribute-rating-scales condition).

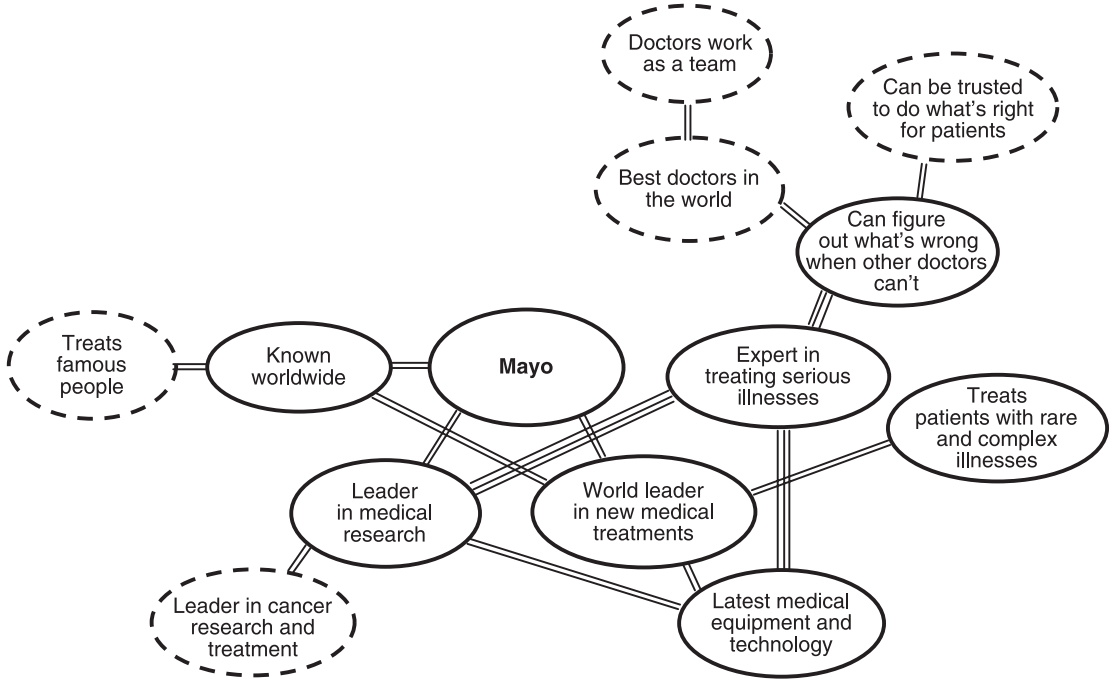
Procedure. Participants were randomly assigned to one of the procedure conditions and were interviewed individu-

Figure 6
STUDY 1: CONSENSUS BCM FOR FAMILIARITY GROUPS

A. Very Familiar



B. Somewhat Familiar



Notes: N = 88 for very familiar group, and N = 57 for somewhat familiar group. The solid-line circle signifies core associations, and the dashed-line circle signifies non–core associations.

Table 3
STUDY 1: COMPARISON OF BCM FOR FAMILIARITY GROUPS

	Familiarity	
	Very Familiar	*Somewhat Familiar*
Total number of associations	12.01[a]	10.04[b]
	(4.44)	(3.94)
Total number of links	12.03[a]	10.04[b]
	(4.46)	(3.94)
Number of first links	5.35	4.79
	(3.17)	(3.05)
Number of second-level links	4.38	3.75
	(2.73)	(2.75)
Number of third-level links	1.69[a]	1.11[b]
	(1.19)	(1.20)
Number of fourth-level (or higher) links	.59	.37
	(1.02)	(.98)
Number of relationship association links	2.34[a]	1.30[b]
	(1.70)	(1.16)
Number of first-order relationship association links	.92[a]	.51[b]
	(1.12)	(.83)
Number of single lines	2.68	2.72
	(2.14)	(2.59)
Number of double lines	4.06	3.94
	(2.45)	(2.00)
Number of triple lines	5.27[a]	3.35[b]
	(2.90)	(3.02)

Notes: N = 88 for very familiar group, and N = 57 for somewhat familiar group. Cells with different superscripts differ from each other at $p < .05$. Standard deviations are in parentheses.

ally by an employee of a mall-intercept research firm. Respondents were told that they were participating in a consumer study of health care organizations and would be answering questions about the Mayo Clinic. Participants were encouraged to express their opinions, whether positive or negative, and were also told that the researchers were not employees of the Mayo Clinic.

Respondents in the BCM condition constructed a brand map using the same procedure described in Study 1. However, we modified the set of brand associations in several ways. First, we included several foils, consisting of positive statements that are not usually associated with the Mayo Clinic, such as "has well-regarded drug and alcohol rehab services" and "has many convenient locations." We included these to assess whether the mapping procedure, which provides respondents with a prespecified set of brand associations, biases consumers toward including more positive associations than those needed to reflect their view of the brand. Second, we included more negative brand associations, such as "big and impersonal" and "only for the rich and famous," to encourage consumers to select negative associations during the mapping stage if they had negative perceptions of the brand.

Participants in the attribute-rating-scales condition completed a survey about the Mayo Clinic. The survey contained 23 questions about the Mayo Clinic, such as "Do you agree or disagree that the Mayo Clinic has excellent doctors?" and "Do you agree or disagree that the Mayo Clinic treats people from around the world?" These questions covered all 23 brand associations contained on the laminated cards used in the BCM procedure. Respondents were asked to agree or disagree with each statement on a 1 ("strongly disagree") to 7 ("strongly agree") scale. After completing these ratings, participants completed the same demographic and background questions as in Study 1. Respondents were thanked and dismissed.

Results

To assess convergent validity, we compared brand maps that the respondents in the BCM condition produced with the rating-scales data obtained in the survey condition. First, we compared perceptions for the set of brand associations included in the BCM and rating-scales conditions. We correlated the frequency of mention of each brand association across the brand maps that the BCM respondents constructed with the corresponding mean scale rating of those associations by survey participants. The resulting correlation of .844 ($p < .01$, N = 23) indicated that the brand associations that consumers deemed to be most important in building their individual brand maps tended to be the same as those that the survey participants rated highly. For example, the association most frequently mentioned on individual brand maps ("has advanced medical research") was also one of the most highly rated associations (M = 6.40) in the survey.

Second, we extended this basic analysis by computing weighted frequencies of mention for brand associations included on individual brand maps in the BCM condition. A comparison of these weighted frequencies with rating-scales data enabled us to assess the validity of several features of the mapping procedure: (1) the hierarchical placement of brand associations on the consensus map as direct connections to the brand (Level 1) or connections to other associations (Levels 2, 3, and 4) and (2) the strength of brand association links as indicated by the presence of single, double, or triple lines in the consensus map.

To address the first issue, each time a brand association was included on a map, we weighted it by the level at which it was placed; higher weights were attached to associations that were linked more closely to the brand. Weights ranged from four (directly linked to the brand) to three (linked one level below in the hierarchy) to two (linked two levels below in the hierarchy) to one (linked even lower in the hierarchy). This procedure yielded a weighted frequency of mention for each brand association, which we then correlated with the corresponding mean scale rating. The resulting correlation of .837 ($p < .01$, N = 23) shows that the hierarchical placement of brand associations on brand maps converges well with ratings of the same brand associations from survey data.

To address the second issue, each time a brand association was included on a map, we weighted it by the number of lines connecting it to the brand or to the association directly above it. Weights ranged from three (triple line) to two (double line) to one (single line). This procedure resulted in a weighted frequency for each brand association, which we then correlated with the mean scale ratings as we did previously, producing a correlation of .845 ($p < .01$, N = 23). Thus, it appears that the selection of connecting lines, which was meant to denote the strength of the association, also converges well with the evaluations of rating-scales respondents.

Discussion

Our results provide evidence of convergent validity for the BCM. Although the BCM and attribute rating scales are

different in orientation, they agreed on important aspects of the way consumers view the Mayo Clinic brand. Comparisons between these methods add to the validity analyses we presented in Study 1, providing additional confidence that the elicitation and mapping procedures measure brand perceptions as intended.

GENERAL DISCUSSION

Contributions to Brand Measurement

The BCM method offers a new option for consumer mapping techniques. It delivers a consensus brand map, which identifies the most important (core) associations that consumers connect to the brand and how these associations are interconnected. Unlike methods such as ZMET, our approach gathers consumer perceptions using structured elicitation, mapping, and aggregation procedures. Standardization offers several advantages. First, the elicitation stage can use existing consumer research, enabling a firm to reduce time and expense. Second, because the mapping stage is structured, respondents can complete the task quickly (15–20 minutes), without the need for extensive interviews or specialized interviewing teams. This feature makes the BCM suitable for different data collection venues, such as mall intercepts and focus groups, and allows for the collection of much larger and broader samples. Finally, because the aggregation process involves the relatively straightforward use of decision rules, obtaining a consensus brand map is less time consuming and less subjective and does not require specialized statistical training. These advantages allow for the construction of consensus brand maps for different market segments, geographic segments, or constituencies.

The BCM method can also be combined with other brand-mapping techniques. Consumer mapping techniques, such as ZMET, offer an unstructured format for eliciting brand associations, allowing consumers complete freedom to express their conscious and nonconscious brand perceptions in many different ways. In situations in which these features are desirable, ZMET could be used for developing a set of brand associations, and the BCM could then be used to structure the mapping and aggregation stages, providing a more efficient way to develop a consensus brand map. Similarly, the BCM could be used for the elicitation and mapping stages to produce individual brand maps; analytical mapping techniques, such as network analysis, could then be used as a more sophisticated approach to producing a consensus map.

Finally, the BCM is unique among mapping techniques insofar as it has been evaluated according to traditional tests for reliability and validity. Standard measurement criteria, such as convergent and nomological validity, are as important for brand-mapping techniques as they are for multi-item scales, providing assurance that our methods measure what they are intended to measure.

Contributions to Brand Management

The BCM method offers a picture of how consumers think about brands, with a visual format that makes it easy for managers to see important brand associations and how they are connected in the consumer's mind. In particular, one of the most important features highlighted in brand maps is the core brand associations, the most important set of brand associations that drive the brand's image. Although consumers may identify many things with a brand, it is the core brand associations, especially those linked directly to the brand, that should be the focus of management efforts to build, leverage, and protect brands.

Consider the patient map for the Mayo Clinic (Figure 3). There are six associations directly connected to the Mayo Clinic brand. To build or maintain the brand's image among patients, management would need to ensure that these associations and any associations connected to them continue to resonate with consumers. For example, to maintain the perception that the Mayo Clinic has the "best doctors in the world," branding efforts could be aimed at making this association salient in communications. In addition, communications could stress that "doctors work as a team" and that the Mayo Clinic has "approachable, friendly doctors," because these associations are linked with "best doctors in the world."

Of equal importance, the core brand associations should be protected from erosion or dilution. For example, to protect an association such as "leader in medical research" from eroding, the organization needs to affirm its commitment to medical research through funding, staff, and publicity. An important way that the Mayo Clinic could accomplish this would be to continue to commit to being the "leader in cancer research" and to continue to "publish health information." Activities that are incongruent with the core brand associations need to be questioned for the possibility of diluting important brand associations or adding new brand associations that are inconsistent with the image. For example, if the Mayo Clinic opened cosmetic skin care salons, this would certainly be inconsistent with existing associations, such as "world leader in medical treatments" and "expert in treating serious illnesses."

Changes in the brand over time should be monitored with respect to the core brand associations uncovered by the BCM. Surveys that track brand perceptions should assess consumer perceptions of the core brand associations found in the consensus brand maps. The BCM methodology can be repeated on a long-term basis to evaluate whether consumer perceptions of the brand have changed as a result of branding programs or competitive activity. For example, the BCM could be used to evaluate the brand's image every three to five years, with consumer surveys tracking intermediate changes in core brand associations at 6–12 month intervals.

Future Research Directions

Several issues remain in refining the BCM methodology and assessing its suitability for a wide range of branding contexts. First, it would be useful to evaluate how well the BCM operates for different types of brands. The Mayo Clinic has many brand associations that are attribute related (e.g., "best doctors in the world"), whereas other brands may have more product-related or experience-related associations. We have applied the BCM to several brands, including Nike, Disney, and Sony, with promising results. For example, with Nike, we carried out the elicitation and mapping procedures with college students, who participated in a class setting. We used the same aggregation procedures as those described in the Mayo Clinic application, produc-

ing a consensus brand map for Nike with acceptable levels of reliability and validity.[3]

Second, it would be useful to incorporate procedures into the BCM to assess the nature of relationships between associations, that is, whether it is causal, correlational, or something else. Although we can speculate about the relationships shown in the consensus brand maps, we have not yet developed a technique for doing so on an objective basis. For example, it seems clear that perceptions of Mayo Clinic as "treats famous people around the world" cause people to believe that Mayo Clinic is "known worldwide." However, being a "leader in cancer research" could be an instance of being a "leader in medical research," or one of these associations could be driving (causing) the other. We believe that procedures similar to those used in understanding causal reasoning chains (see Sirsi, Ward, and Reingen 1996) could be incorporated into the mapping stage of the BCM to provide information about brand association relationships.

Third, modifications of the BCM mapping procedure could be developed to make data collection even easier and more flexible. In the Nike research, we modified the mapping procedure to be amenable to data collection in a large group setting (i.e., list of brand associations were shown on a projection screen). Further development along these lines, especially with computer-aided data collection, would be valuable as well.

Although work in these areas remains to be done, we believe that the BCM methodology holds promise and is worthy of further research to understand its uses and limitations better. We look forward to meeting these challenges.

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[3]For example, analyses of split-half reliability yielded similar results to those reported for the Mayo Clinic. Correlations computed across split-half maps for Nike were highest for the presence of core brand associations ($\phi = .84$, $p < .01$; N = 30) and presence of first-order brand associations ($\phi = .80$, $p < .01$; N = 30) and moderate for the presence of specific brand association links ($\phi = .49$, $p < .01$; N = 435).