

Mapping Consumers' Mental Models with ZMET

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ABSTRACT

In the quest to understand the customer, consumer researchers, whether practitioner or academic, must understand the perceived personal relevance of a product, service, or brand from the consumers' perspective. Fundamentally, what must be understood are the cognitive structures or mental models that underlie consumers' feelings of involvement. This article demonstrates the power of the Zaltman metaphor-elicitation technique (ZMET) (Zaltman, 1997) to gain such consumer insight by first eliciting and then mapping consumers' knowledge structures. The article provides illustrations of how ZMET can be used to create a collective cognitive map for a group of consumers, and how ZMET data can be mapped in different ways to give greater insight into consumers' product knowledge structures. Also provided is a description of how the knowledge structures of consumers are subdivided and grouped around important meaning themes that frame and motivate a person's involvement with an activity. Ultimately, it is demonstrated that consumers' mental models are made up of both cognitive (beliefs) and emotional (feelings) components, and that these structures of meaning are activated by the current consumption situation. © 2002 Wiley Periodicals, Inc.

The business press is replete with calls for marketing practitioners to understand their customers better, more thoroughly, and more deeply, because such understanding is seen as vital to the success of the business venture (e.g. Mazur, 1995; "Sovereign Consumers," 1998). But just what is it about the customer that one needs to understand? It is sug-

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gested that marketers, whether practitioner or academic, need to understand the *perceived personal relevance* of their product, service, or brand—from the consumers' perspective. In other words, marketers need to understand the cognitive structures, or mental models, that underlie consumers' feelings of personal relevance. These mental models of consumers' relationships with the product or brand organize and guide consumers' thinking, their emotional reactions, and their overt behavior regarding the product or brand.

Though called by other names, many consumer-research topics directly involve cognitive structures, including product perceptions, brand attitudes, brand-attribute beliefs, brand personality, and consumer expertise. As consumers acquire new knowledge and interrelate it with existing knowledge in memory, they are assumed to form cognitive structures in memory. These cognitive structures or mental models represent the interpreted meanings of a product or a brand. Thus it can be seen that most topics in consumer research involve different aspects of consumers' mental models, or the antecedents and consequences of those mental models.

This article demonstrates how a relatively new approach to understanding consumers—the Zaltman metaphor-elicitation technique or ZMET—can be used to elicit consumers' meaning about the personal relevance of a topic and then map those meanings as mental models (Zaltman, 1997; Zaltman & Coulter, 1995). The term *mental model* is preferred over *cognitive structure*, because *cognitive structure* implies all representations are cognitions (beliefs). The broader term, mental models, however, allows other meaning representations to be included such as attitudes, emotions and feelings, symbols, actions, goals, personal values, images, memories of past consumption events, consumption visions of anticipated experiences, and representations of sensory experience such as touch, taste, and smell. This view fits better with current cognitive neuroscience that sees thoughts as image based (Damasio, 1994; Pinker, 1994, 1997; Zaltman, 1997). Thus, the contents of mental models necessarily are images of many different things (not merely verbal-centric beliefs).

THEORETICAL APPROACHES TO MENTAL MODELS

Although cognitive structures or mental models are widely assumed to be fundamental, underlying influences for most consumer behavior, few researchers have directly investigated them. For example, in his theory of consumer choice, Bettman (1979) describes the fundamental motivational influence on consumers' behaviors as a set of goals organized into a hierarchical structure—a goal hierarchy. Bettman describes goal hierarchies in rich detail, but he does not measure this important mental model and provides few examples of actual goal hierarchies. In fact,

more than 20 years later, only a few researchers have sought to directly measure consumers' goal hierarchies (Bagozzi, 1997; Gutman, 1997; Pieters, Baumgartner, & Allen, 1995).

Means–end chain theory (Gutman, 1982, Olson & Reynolds, 1983) and the accompanying laddering methodology (Reynolds & Gutman, 1988) mark an obvious exception to the lack of research on consumers' cognitive structure. The means–end approach focuses on the cognitive structures that influence consumers' decision making in a purchase choice situation (Gengler, Mulvey, & Oglethorpe, 1999; Reynolds & Whitlark, 1989; Valette-Florence, 1998; Zeithaml, 1988). Of course consumers also have mental models that guide their thinking and behavior in many other aspects of consumption besides making purchase decisions.

Past Research Focused on Structure, Not Meaning Content

To date, little research has focused on the identifying the *content* of consumers' mental models—the actual meaning representations contained in the mental model—despite repeated calls for such investigations (Bohman & Lindfors, 1998; Pieters et al., 1995; Walker, Celsi, & Olson, 1987). The more typical academic approach emphasizes the *structure* of mental models over their content (Olson & Reynolds, 1983). *Structure* refers to how that content is organized in memory—for example, a hierarchical organization or an associative network. *Content* refers to the actual ideas or concepts represented by the mental model, that is, the personal meanings contained therein. Most academic consumer researchers, perhaps following the orientation in psychology of postulating and testing more formal models of memory structure (e.g., alternative hierarchical organizations or Anderson's [1983] ACT* architecture of cognition), have largely ignored the meaning content of mental models. This is a bit strange, because, fundamentally, one cannot dissociate structure from content. The structure of such networks of representations is revealed only through the content and the linkages identified between concepts. Conversely, one cannot understand the content of mental models without measuring the connections between concepts (thus revealing structure). Strictly speaking, content cannot be untangled from structure, and vice versa—each is revealed in terms of the other.

In contrast, marketing practitioners are mostly interested in understanding the meaning content of consumers' mental models, because such insight can help them develop more effective marketing practices. Understanding both the structure and the content of their customers' mental models can give insight into such questions as: What do customers know about my brand or product? What do people think about when they consider buying a brand in my product category? How does my product fit into the lives of these consumers? Why is my product important to these customers?

In summary, the meaning content of mental models has received disappointingly little academic interest. Very few scholars have sought to create maps of consumers' mental models, and thus amazingly little is known about how consumers create and represent the meaning of products and brands. The major issue of relevance for consumer researchers is viewed to be meaning, and a study of meaning requires attention to both content and structure. Consumer meaning is found in the linkages between content nodes within the mental structure. Any particular node has little meaning in and of itself; rather each concept defines its meaning through its linkage with other concepts, thereby forming a structure. Such linkages can be of different types and different forms, such as causal or simple association. As the types of linkages change in the structure, so too does the meaning. The dearth of research on this point may be due to the difficulty of capturing and representing cognitive structures and a lack of methods for doing so.

Means–End Chain Theory and Laddering

To date, means–end chain analysis and laddering has been the most prevalent approach to identifying and representing the content and structure of consumers' mental models for products and brands. Both practitioners (Reynolds & Craddock, 1988; Reynolds & Rochon, 2001) and academics (Pieters et al., 1995) have used laddering interview methods built upon the theory of means-end chains (Olson, 1989; Howard, 2001) to identify and map consumers' cognitive structures. Laddering is a method of probing during in-depth, one-on-one interviews that was designed to understand the deeper bases of consumer decisions by attending to the various consequences of a choice. The output of a laddering study is a hierarchical value map (to use the terminology of Reynolds & Gutman, 1988), which represents the consensus mental model for a group of respondents. For instance, a respondent in a laddering interview might elicit a means–end chain (a simple mental model) that links product attributes and functional benefits to an important personal value or goal such as achievement. The laddering method usually stops at identifying the personally salient end state or consequence. Identifying *achievement* as an end goal may be a valuable insight, but what *achievement* means in the voice of the respondent is not known; it is merely a word label used as a node in an associative network. The ZMET process can provide a deeper and richer understanding of the important personal constructs elicited through traditional laddering probes.

The ZMET Approach to Measuring Mental Models

ZMET (Zaltman, 1997; Zaltman & Coulter, 1995) is a relatively new method developed in the early 1990s to understand customers by eliciting metaphors that reveal important aspects of their underlying men-

tal model. By incorporating laddering probes into ZMET interviews, ZMET is capable of building the connections and skeletal structure found in a traditional laddering study. But by also using the strength of metaphor elicitation, ZMET can go further to describe, in the voice of the respondent, the meaning of the concepts and ideas in the mental model. Further, by using metaphor as research tool, ZMET can help us understand more deeply the linkages themselves that form the consumers' mental structure (of both thoughts and feelings) surrounding the object of inquiry.

ZMET can thus deepen understanding of knowledge structures by fleshing out the concepts and structure identified through laddering probes. This allows the researcher the opportunity to look at the data in more varied and deeper ways than is possible through a traditional laddering study. As will be demonstrated in this article, a researcher using a ZMET approach can develop a rather rich mental model and explore the meanings associated with specific subsections of a hierarchical value map or a consensus map of consumers' mental models.

Two theoretical assumptions underlying ZMET are particularly relevant to the purposes of showing the strength of ZMET as a method of eliciting and mapping consumers' mental models (see Zaltman, 1997).

- **Unconscious Tacit Content.** Much of the content of consumers' mental structures is unconscious or tacit (below the surface-level thinking of conscious awareness). Thus such meaning is difficult to directly access. Methods to elicit such knowledge and bring it to the surface where it can be interpreted and mapped are needed. Zaltman (1997) notes that metaphors are an important tool for eliciting such hidden knowledge. ZMET uses metaphor as a research tool to elicit deep meaning.
- **Images in Mental Models.** Much of the current thinking in cognitive science is sympathetic to the view that thoughts are image based and language is a tool humans use to try and convey their mental images to others (Damasio 1994; Pinker, 1994, 1997; Zaltman, 1997). If thoughts are indeed image based, then the content of cognitive structures necessarily are images. Thus, ZMET asks respondents to select several pictures that express their thoughts and feelings. These visual images become a projective medium to help informants identify and communicate the content (both thoughts and feelings) and connections within their mental models.

For these reasons, ZMET is ideally designed to measure and map consumers' mental structures. The main purpose of this article is to demonstrate the usefulness of ZMET in identifying rich and elaborate cognitive structures or mental models. ZMET is particularly useful in identifying the deeper, abstract, and therefore more unconscious and

elusive aspects. With the additional use of laddering probes, the structural linkages between these concepts can be identified and mapped. Thus ZMET's use of metaphor to elicit and identify important, often elusive concepts, coupled with laddering probes to identify structural associations between these components, provide a useful method for eliciting and mapping both the content and structure of consumers' mental models. The models produced by ZMET usually concern how the object of research (e.g., a product) fits into a consumer's life. Thus, the goal of a ZMET study is to elicit, describe, and map consumer's thoughts and feelings—emphasizing both beliefs and emotions. This study will demonstrate the power of ZMET to provide a deeper understanding of consumer's mental models.

METHODOLOGY

Respondents

The interviewees were 15 very highly involved mountain bikers, members of the mountain biking "subculture of consumption" (Schouten & McAlexander, 1995). Some people known to be mountain bikers were first identified, and the other respondents were selected through a snowball sampling process (Sudman, 1976; Zikmund, 1997). Highly involved mountain bikers were chosen for two reasons. Because high involvement often (but not always) correlates with high product knowledge and expertise (Celsi & Olson, 1988; Christensen & Olson, 2001; Mitchell & Dacin, 1996), highly involved respondents are likely to have rather elaborate and complex mental models surrounding the sport. This provides a rich source of meanings from which to draw for this demonstration of ZMET cognitive mapping. Second, because of the popularity of mountain biking in the community, there was access to a large and willing subject pool.

All participants completed the Personal Involvement Inventory (PII) (Zaichkowsky, 1985). The literature suggests that high involvement scores on the PII range from 111 to 140 (PII scores have a possible range of 20–140). All informants in the sample had scores above the 111 heuristic (the lowest score was 114; two participants scored 140). The average PII score for all respondents was 128.13. Thus, by the usual PII criterion, all participants are highly involved.

Each participant was paid \$25 for participating in the study. The interviews were tape recorded and then transcribed to create the data base for subsequent analysis.

The ZMET Process

Approximately 1 week prior to the interview, each recruited participant was contacted and given a set of instructions. First, they were asked to

think about mountain biking. Then they were told to select 8–10 pictures that represent their thoughts and feelings about mountain biking and bring the pictures to the interview. Each picture is a metaphor that expresses one or more important meanings about mountain biking. Stated differently, the ZMET process enables respondents to project their mental model onto the several pictures and express important cognitive (thoughts) and emotional (feelings) aspects of that mental model.

Respondents participated in depth interviews conducted by three interviewers who were trained in the ZMET methodology and experienced with conducting ZMET interviews. The interviews lasted 1½–2 hours. The interviews followed closely the several steps in the ZMET method as described by Zaltman (1997). Specifically, respondents began by discussing their thoughts and feelings represented by each of the pictures they brought to the interview.

The interviewer began by asking the respondent to choose their first picture and explain how this image represented his or her feelings about mountain biking. As the respondent explains the meaning represented by the photo, interviewers are trained to hear vivid metaphors mentioned by (elicited from) respondents and then probe for further elaboration of those metaphors. To ensure understanding, the interviewers also use reflexive interviewing techniques such as restating informants' comments and summarizing to ensure comprehensiveness (Athos & Garbarro, 1978; Roger & Farson, 1984). Once the informant's meaning is well understood, the interviewer uses laddering probes to see how the ideas expressed are linked to other self-relevant consequences and concepts. Then these superordinate ideas are explored to assure understanding. This process continues until the most superordinate value or goal states are identified and detailed for that picture. This probing and questioning process is repeated until all the respondents' pictures are explored. In this way the ZMET interview “fleshes out” and details the meaning of important components in the mental model or meaning structure—all in the voice of the respondent.

With 15 respondents in this ZMET study, the heuristic threshold required to assure saturation in the study and the completeness of the resulting consensus map is far surpassed (Morse, 1994; Zaltman & Coulter, 1995;). Zaltman (1997, p. 432) notes that “at most, data from four or five participants . . . are generally required to generate all of the constructs on the consensus map.”

ZMET Analysis

Content coding of the transcripts began by importing the transcribed interviews into a computer software program called Atlas. Atlas is built upon the grounded theory techniques of Strauss and Corbin (1990). With the use of Atlas, all the ideas mentioned in the interview transcripts were identified. As recurring concepts began to emerge, con-

structs or codes were created to represent specific categories of meaning and gave the construct a name. Throughout the coding process, a rigorous questioning of each coding interpretation was applied to verify that it is grounded in the actual verbatim statements of the respondents. This “constant comparative method of analysis” (Glaser & Strauss, 1967, p. 101) adds rigor to the coding process by forcing the researcher to go back to the data again and again to ensure that each interpretation is well supported by verbatim evidence in the transcripts. “Does that code really reflect what the participant is saying? Is a different code required altogether?” This rigorous coding process forces a very close reading (and rereading) of the interview transcripts, and yields tight, well-grounded interpretations.

Once a final list of constructs was developed, the transcripts were reread and the relationships between constructs were coded. When respondents noted (in their narratives) that two ideas were interrelated, linkages between the relevant constructs were coded. For instance, a respondent might say, “exercising on my bike helps me get rid of the stresses of daily life.” This would be coded as a construct dyad—“exercise [leads to] stress relief.” It is a relatively straightforward matter to aggregate all the unique construct dyads to create an overall mental model of each participant’s thoughts and feelings about mountain biking. These individual-level mental models represent the first order of analysis that is close to the voice of the respondent (Van Mannen, 1979).

Creating a Consensus Map of Mental Structure

Next the individual-level models were entered into a software program designed specifically to combine the individual mental models into an aggregate map that represents a consensus mental model across consumers. The program keeps track of how many different respondents connected every pair of constructs (i.e., how many individual respondents noted that exercise leads to stress relief). The program is able to produce consensus maps of consumers’ mental models at different levels of consensus. At a cutoff level of one, every connection between constructs made by any respondent is represented and the resulting map is a mass of links and concepts that usually is unintelligible. As the cutoff level is increased (to 2, 3, 4, and beyond), connections and constructs disappear and the maps become more interpretable. At some point so many constructs have been eliminated that the resulting map is not interesting. In practice, researchers view several consensus maps at different cutoff levels until they find a map that balances detail and interpretability. As a rule of thumb, this map usually has a cutoff of about $\frac{1}{4}$ – $\frac{1}{3}$ the number of study respondents. Different cutoff levels and their resulting maps are explored in an effort to identify a consensus map that is the most meaningful and interpretable based on the research questions and goals (Reynolds & Gutman, 1988).

FINDINGS

Consensus Map of Consumers' Mental Models

Figure 1 presents the aggregate consensus map (mental model) for these 15 highly involved mountain bikers. This aggregate map represents the main concepts identified by these consumers and the linkages between the concepts as reflected in their interviews. As a consensus map, it identifies the dominant (most frequently mentioned) concepts (those connected to another concept by at least 4 of the 15 respondents). This consensus map can be thought of as analogous to a map of interstate highways that shows the major routes between the main destinations (cities). There are several rules of thumb that can facilitate reading a consensus map.

Look for Central Constructs. First, look for the central, highly connected constructs (those constructs that are linked to several other constructs). For instance, Figure 1 reveals several central constructs—for instance, *accomplishment* and *in nature*. Other central constructs are *challenge*, *stress relief*, and *sharing experiences*. Because these central constructs control a constellation of related concepts revolving around them, they define themes or frames of reference. From a mapping perspective, these themes are sub-regions of the overall mental model. Themes represent how consumers have self-organized their thoughts and feelings into smaller units of meaning within their overall mental model. Thus, being *in nature* and *accomplishment* are important sub-domains of these riders' overall mental model for mountain biking. But they also mark the kernel of a larger thematic organization in their mental models that frames the respondents' views of and interactions with mountain biking. Essentially these themes identify what mountain biking means to these respondents, why they participate in the sport, and how mountain biking fits into their lives. Theoretically, as highly involved, highly expert consumers gain more knowledge and experience, they subdivide their knowledge into manageable portions or chunks (cf. Mitchell & Dacin, 1996). How customers naturally self-organize meaning in this way is a fundamental step toward a useful and deeper consumer understanding.

Look for the Overall Goal/End State. The overarching goal among the thematic orientations shown in Figure 1 is *enjoyment and having fun*. Such an overall end concept that all other constructs link to is another thing to look for when trying to read a consensus map of cognitive structure. Every rider, to greater and lesser degrees, indicated that they engage in mountain biking because fundamentally, it is fun or enjoyable. That is, mountain biking, whether a recreational or even a professional activity, is viewed more deeply as a hedonic pursuit. One

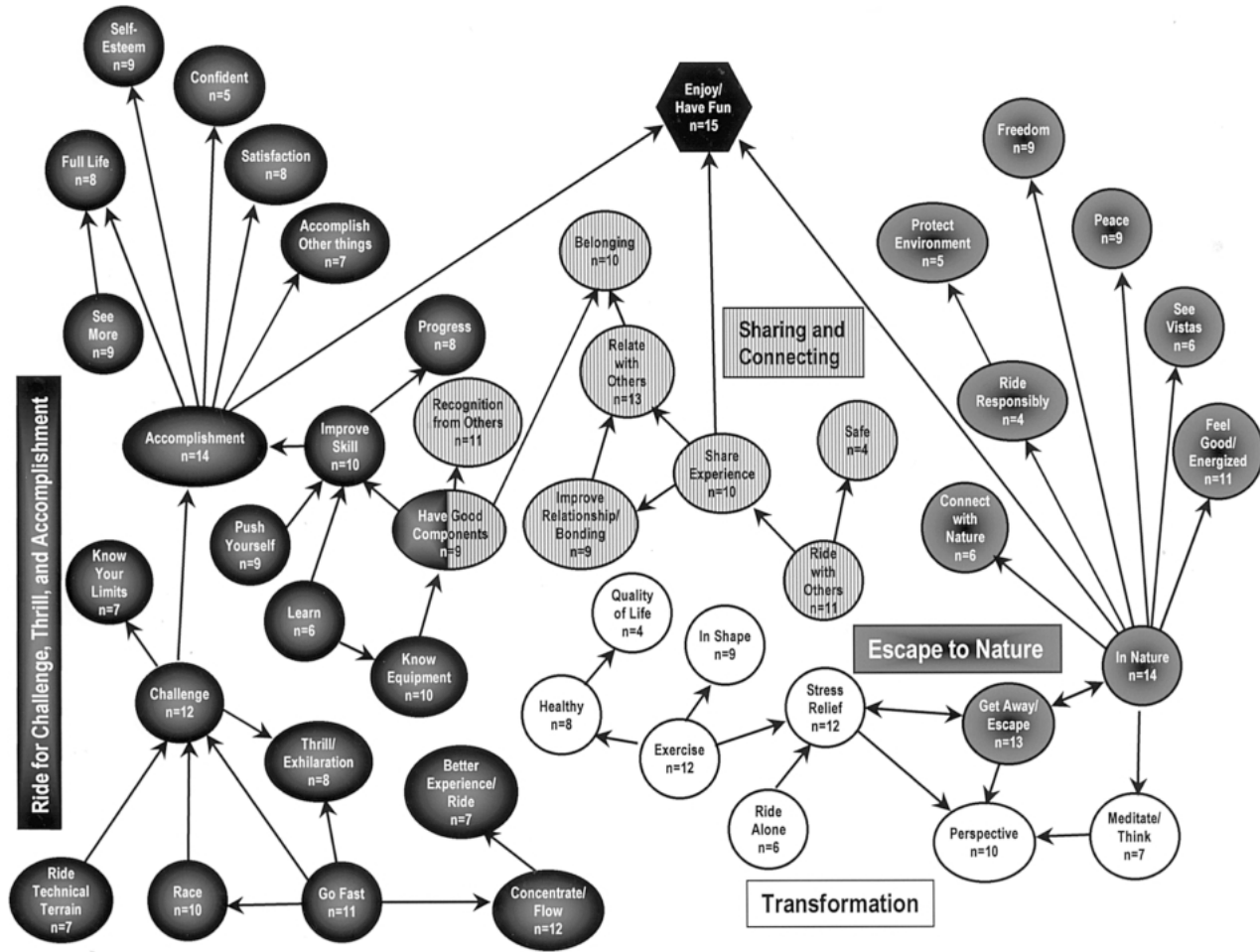


Figure 1. Mental model for highly involved mountain bikers.
N = 15; Connections made by 4 or more respondents

respondent noted that riding a bike is like “random smiles” and “random laughter.”

The consensus map clearly shows that the end state *having fun* is linked to three of the four different thematic domains of the overall mental model. For instance, the darkened circles on the left side of the map reveal that participants feel that the *challenge* of mountain biking brings a sense of *accomplishment* that, in turn, is a major source of personal *enjoyment*. Likewise, being *in nature* leads to the positive affective and hedonic state of *having fun*. Or, *sharing experiences* with important others makes the biking experience richer, fuller, and ultimately more *fun*.

Look for Missing Constructs. Another thing to look for when interpreting a consensus map is missing constructs. What ideas or concepts did you expect to be present but are not? Conspicuously absent from this aggregate map is a mountain bike or biking construct. Because the overall focus of the study was mountain biking, the concept is implicit throughout the map. For example, the *exercise* construct can be assumed to be exercising on a mountain bike. The *in nature* construct implies riding a mountain bike in nature. Even the ubiquitous *having fun* construct implicitly relates to having fun riding on a mountain bike.

Broad Meaning Themes

Figure 1 reveals four collective orientations or themes about mountain biking shared among the respondents. Each thematic orientation is represented by different shadings and fill patterns in each subsection of the consensus map in Figure 1. The four themes are (a) riding for challenge, thrill, and a sense of accomplishment; (b) sharing experiences and connecting with a group; (c) seeking a transformation experience in their emotional and/or cognitive state; and (d) escaping to nature.

Each thematic segment of the consensus map will be discussed, with a focus on the dominant constructs in that thematic region. Space constraints limit a larger explication of less-referenced constructs, but the same analyses could be applied to them. The following discussion also demonstrates how these collective, thematic orientations are grounded in the data.

Riding for Challenge, Thrill, and Accomplishment. The constructs related to the “Challenge/Accomplishment” theme are constructs shaded dark with lighter centers located on the left side of the consensus map (Figure 1). The riding experience has a direct payoff for these bikers. Riding is a source of joys, thrills, and challenges, and provides a sense of accomplishment, personal insight, and satisfaction. Clearly the Challenge/Accomplishment thematic orientation encompasses the most constructs nodes on the consensus map. If one looks for the most inter-

connected of those constructs, one can identify the key concepts in the Challenge/Accomplishment theme—*going fast*, *thrill*, *challenge*, and *accomplishment*. These will be closely investigated. Table 1 presents several verbatim examples to more fully reveal the meaning underlying each of these constructs.

Going Fast and Thrills. A major source of enjoyment in mountain biking is the *thrill* of extreme speed in a dangerous, sometimes fear-evoking environment. As noted in Table 1, “flying down” the mountain produces physiological responses (a healthy adrenaline rush) these riders called “euphoric” and “an absolute high.” With experience, this physiological/affective state becomes a desired consequence that bikers seek through speed. *Going fast* also allows a healthy expression of aggression. Further, as seen in the verbatims in Table 1, bikers view speed (going fast) as taboo in common situations but allowed in the freedom of mountain biking in the natural environment.

Going fast coupled with other environmental factors (especially danger and fear) produces a situation ripe with opportunities for personal *challenge* (see Figure 1). Being “close to the edge” with little room for error produces a tactile *thrill* on one hand and an opportunity for personal *accomplishment* on another. There are mental, physical, and environmental (natural) sources for these challenges. Many of these riders, especially those with more advanced skills and expertise, time themselves and work to break personal records to mark their continuous improvement. *Technical terrain* and *racing* situations produce *challenging* environments that are highly desired by these advanced riders. The continual process of testing and challenging allows some of these riders explore, find, and test their own personal *limits* and in turn come to know themselves better.

All of these challenges lead to feelings of *accomplishment* (see Table 1) and to the partial fulfillment of higher destinations such as the personal values of *self-esteem*, *confidence*, and having a *full life*. There is a belief among these participants that success breeds success and that mountain biking successes may increase one’s confidence and ability to the point where success in other areas of life is more attainable.

Sharing and Connecting. The social aspect of mountain biking is one of the four main themes expressed by these involved riders. The theme of Sharing and Connecting is indicated by the constructs filled with light gray, vertical hatching in the top-center portion of the consensus map (Figure 1). The *shared experience* of riding is the central construct in this submap.

- Sharing the mountain biking sport with friends and significant others and connecting with others who understand and see the world as they see it are important elements of the riding experience for

Table 1. The Ride for Challenge, Thrill, and Accomplishment Orientation: Verbatims Associated with Key Constructs

Go Fast
• Extreme speed—I like to go fast . . . It's kind of a combination of fear and euphoria. • Going fast is thrilling but the fear is also the thrill. • That's what I look for is to go down the hills and enjoy the speed. • I like going fast. Whereas in a car you are not allowed to drive over the speed limit. On a mountain bike there is no speed limit. • Like everybody's goal is the lightest bike possible, because the lighter you are the faster you go.
Thrill/Exhilaration
• A lot of times there is danger involved and that is sometimes part of the thrill of it. • Going really fast is kind of like a little kid doing something he knows mommy told him not to do just because it is forbidden, therefore it is fun—It's exhilarating. • Speed is about thrill . . . This is the heart of it or the meat of it. This is the thrill, like the absolute high. Am I going to make it? Am I going to wreck? • I am a thrill seeker, it's a way to get adrenalin and just sort of fulfill that need . . . That's my personality.
Challenge
• You're trying to overcoming some of the obstacles that nature can give you . . . The fallen tree . . . the river to cross. • I think it's because I am so close to the edge but I am not going over it, it is testing my skill and showing that I can master this trail and not get hurt. • Again it's the challenge of doing it and a lot of times when a trail is tight and tight meaning the trees are close together and it is kind of—like there is not much room for error. • It is like the thrill of the chase, trying to go faster every time. I have my personal record and I'm trying to break it. • By setting personal goals you've set a challenge . . . Riding, you can challenge yourself by riding a very difficult trail. • A race is such a mental and physical battle against yourself, you know. You hurt so bad . . . you get so sore, you get cramps . . . sometimes you can't even continue riding. But the real race is just keeping yourself going.
Accomplishment
• It's just kind of rewarding at the end of the day when we're done and thinking back on parts of the trail that you went through. You think, "that it was tough, that I accomplished it. It wasn't an easy way out and I pushed myself through a difficult trail or a difficult part of the trail." • It was just a really big sense of accomplishment there . . . We survived that race. • Being able to do something I wasn't able to do before is a real sense of accomplishment . . . Then you've gotten to that point where you feel more confident about your skills. • A sense of accomplishment might actually play a bigger part of [mountain biking] than having fun. The whole reason I went out there and got on a bike was to have fun and to enjoy myself but I enjoy myself a whole lot more if I have accomplished something. • I accomplished something or I had a personal victory there. • There's the triumph of finishing a race.

these participants. As one person put it, riding with other people “reaffirms you and makes you realize that somebody else is actually like you out in the world and that you’re not a complete freak.”

- Associating with other people that “get it”—that also see and understand what mountain biking means—is an important goal for these highly involved riders. “Mountain biking . . . is sort of an exclusive little club . . . We might call it a tribe.” Being a part of this group gives the participants a sense of *belonging*. One rider had a friend in the tribe build a mountain bike frame for him, which he now rides exclusively. As he noted, this small act “brings mountain biking down to a community level . . . You can talk to the people that made your bike. It’s not like some robot off in Taiwan made it for you. It makes mountain biking feel more like a home. It is very comfortable.”

Being able to *relate with others* (see Figure 1) fosters this sense of *belonging*. One participant noted that the common denominator of mountain biking “gives you a connection with another individual . . . You can be on a ride and meet someone for the first time and, boom, you have immediate commonality with them.” This instant connection through the *shared experience* of mountain biking encourages the development of new relationships and maintains old ones. Another respondent said, “If a rider goes down the street, then my eyes are right on them. There’s kind of a respect there. You know you have something in common with them. You can just go up and talk with them.” A different rider, referring to a very difficult team cross-country race he competed in and finished said, “We were four guys that just went through some kind of *bonding* as in a war almost. We came out if it relatively unscathed and we were really happy about it. That is the comradeship, the whole tribal bonding thing if you will.”

In sum, mountain biking fulfills important social goals for these riders and helps them feel connected to other like-minded people and feel understood by them. For most of these highly involved consumers, mountain biking is a social activity, filled with *shared experiences* that enhance connections between people and *improve relationships*, while giving the participants an important sense of *belonging*. Mountain biking engenders a strong sense of community, especially among those who are established members of the tribe. Consistent with this feeling of community is a need to mark one’s membership in the subculture by owning and displaying the right badges (products), such as bikes, clothing, and other gear.

Transformation. The meanings constituting the Transformation theme are represented by the white constructs with no fill found on the lower-center portion of the consensus map (Figure 1). Mountain biking

is an effective means of *reducing stress* through two routes shown on the map: (a) *escaping into nature* and (b) *exercise*. *Stress relief* is a major outcome sought by nearly all these respondents. Following are verbatim comments from two respondents:

- “Nature is a great place to go and peak through the little window, and then come back again. It’s kind of like if you peak through the window and your nose sticks through, you got all these stresses just zoom out . . . they just shoot out into this new dimension then it closes and they’ve kind of gone from you.”
- “A good thing about exercising is it relaxes you, it kind of vaporizes your stress.”

The consensus map (Figure 1) reveals the structure of meanings that constitute the “Transformation” theme. Mountain biking gives riders an opportunity to think and even to *meditate*. This personal time and space gives riders added clarity and *perspective* on life, which helps them deal with its problems. One participant said, “When I come back from riding, I think about my problems differently . . . I can think about them in a whole new way.” Another noted, “Riding puts things into *perspective*, like if my [academic] scores really get to me, I will go out riding, and I’ll see a beautiful landscape and this just shows me that scores are important, but there are other things in life, and I have to keep that in *perspective*.” Mountain biking can help these riders reorient their worldview and thereby deal more effectively with their problems—valued outcomes to these riders.

Exercise, as shown on the consensus map, is a central construct within the Transformation theme. The map shows that exercise has two transformation roles, one emotional and the other more physical. First, exercise is a direct provider of *stress-releasing* benefits sought by the respondents. Second, exercise is seen as an important means to getting (and staying) *in shape* and thereby having a long, *healthy*, high *quality life*. One rider commented, “There is intrinsic value in riding because you are exercising the most important muscle of your body, your heart, and you are making your whole body more efficient.” Another rider said this increased efficiency and health gives him “a greater overall *quality of life*. You can enjoy yourself more if you aren’t exhausted doing trivial tasks.”

In sum, the “Transformation” theme reflects two types of life goals for these highly involved mountain bikers—emotional transformation (relief from stress) and physical transformation (become in shape and healthy). Interestingly, this theme does not connect directly to the overarching goal of having fun as the other three themes do. This indicates a different framing for mountain biking as a transformative tool. As opposed to the other themes that are broadly connected to hedonic pleasure seeking, this theme seems to hold more utilitarian value for these riders (cf. Holbrook, 1999).

Escape to Nature. The Escape to Nature theme is indicated by the shaded constructs on the right side of the consensus map (Figure 1). All but one of the respondents mentioned getting out *in nature* as a goal. Table 2 presents several verbatim comments that illustrate these consumers' thoughts and feelings about the constructs related to *in nature*. Many respondents framed getting *into nature* as an *escape* from the stresses of the modern world. As one of the respondents noted, "The nature and the wildlife and being out and seeing it all—it just kind of gets you away. It helps me get away from urban life." The goal of being *in nature* is a central construct with links to several other constructs that represent important experiential outcomes valued by these riders—*freedom*, *enjoyment*, *fun*, *energized*, *peace of mind*, and a *spiritual connection with nature*. The verbatims in Table 2 reveal that riding *in nature* helps riders connect to past lifestyles ("the way life used to be"), which, in turn, provides a perspective for evaluating their present, personal situations. Being *in nature* provides riders with a sensory feast that dominates their perceptions and cognitions, leaving little room for the mundane considerations of their day-to-day grind or its assorted problems. Phenomenologically, these riders experience nature as another world that is quite distinct from the reality of their everyday world.

Anatomy of Escape to Nature. For a deeper look into the meaning of a particular theme from the overall consensus map, one can map the anatomy of the core group of constructs that constitute that theme. An anatomy map reveals more about how consumers understand the major meanings of each construct in the anatomy. In constructing such an anatomy, core ideas expressed in verbatim comments from respondents are summarized and linked with the construct on the anatomy map. Of necessity, such verbatim quotes from respondents must be omitted in consensus mapping or the result would be a cluttered, unintelligible space. With anatomy mapping, such details can be included, and the ideas that are captured within that construct's meaning can be seen. Figure 2 presents an anatomy map of the theme—Escape to Nature. For example, this anatomy map shows that the construct *connecting with nature* provides mountain bike riders with both a spiritual and a physical connection to *nature*, which is itself a "serene" yet "powerful paradise."

This type of cognitive mapping can reveal important meanings not evident on the consensus map. For instance, Figure 2 clearly illustrates the duality of the *freedom* and *escape* constructs by showing their two opposing meanings. On the one hand, nature provides *an escape from* society, work, pollution, corruption, crowding, boredom, frustration, urban sites, and urbanities. On the other hand, nature enables these riders to *escape to* another world—"a little bit of paradise."

The goal of *freedom* exhibits a similar duality in consumers' minds.

Table 2. The Escape-to-Nature Orientation: Verbatims Associated with Key Constructs

In Nature	• That's a neat thing to do, to be out in the forest in the middle of a big chunk of wilderness and not see anybody and yet be in the middle of all that beauty and pristine serenity. It is an ecstatic feeling—it's great. • I remember one time I was riding down the trail and these deer jumped out right in front of me and I wiped out . . . Normally you don't get to see those things . . . It helps me make sure that I don't forget about nature. • I think there is some element of strength or power in nature . . . but there is clearly something . . . I am drawn to. • The trees, the ecology, the animals, everything is working in perfect harmony with the way it was designed to be. A lot of times in the city, I feel it's a different feeling because people have their problems, there's bad stuff going on. Here in nature, there's a really peaceful feeling. • You just sit there and soak it all in. It's almost like a little paradise.
Get Away/Escape	• It kind of gets you away from the city . . . from your problems. You just don't think about them while you're out. • You feel like you're getting away from the pollution and the corruption of globalization and technology and stuff like that. It feels like you're kind of going back to the basics. • It's been my escape through my youth and I'm hoping it can continue to do that in my adulthood. • Riding is an escape from the day-to-day grind and daily problems. You can get away to your own little world. • It's kind of an escape tool sometimes. I just spent all day riding and that's pretty great to be able to do that. That is my ideal of a good day. You have nothing to worry about. It's a vacation of sports—a vacation. It's a good detachment from responsibility . . . from the stress of work. To leave that all behind—it's an escape.
Connect with Nature—A Physical/Spiritual Connection	• I returned [to Southern Utah] with my mountain bike and really started to explore those places. When you ride there you get a tactile sense of pedaling a bicycle, hearing—if you are on slick rock you don't hear anything. If you are on sand you hear the sand crumble. You can smell the smells of the slick rock in the desert and you can hear the cows and you can hear the animals and the birds as they fly around. You feel your body change, you feel the muscle aches, you feel yourself get out of breath, you have full sense of temperature, direction of wind, you hear things, you smell things, you feel things, so all those things contribute to a much more holistic experience . . . The red dust off the rocks actually forms a paste in your mouth, it has a taste and you feel the grittiness on your teeth and you feel it cake up on your eyes and you see this dust accumulate on your bike tires and all the sweaty parts of your arm and your hand and you know literally that red rock has dust, you eat it, you breathe it, it gets absorbed in your skin, you are experiencing it all. • Even if I go with friends, I tend to get by myself because it's kind of like just being alone and being one with nature. It makes me think back, like way back when, when people just kind of lived out in the wilderness. • Cycling makes you much more aware of your environment I definitely feel more connected to nature.

(Table continued on following page)

Table 2. *Continued*

- They say you're an **extension of nature** because you're going in and out of trees . . . whenever your bike is in contact with the ground, you're an extension with nature—I'm clipped into it my bike and my bike is connected with nature. You just feel—it's just lightly raining, and I would feel it all. You're **part of the woods**. You kind of **blend in** with it.

Freedom

- You are just out there **doing what you want to do** and when you are running around and you see a root or a bump or something I go jump you go out there you are **free to do whatever you want to** . . . there is **nothing to push you**.
- I can say, "I don't feel like going straight ahead, I feel like going down through this thing." It's relaxing to know **that you have freedom**, that you can **go where you want to go**.
- I feel **free from work** for instance.
- This is a flying eagle, freedom—**nothing is expected of me** but just simply being out there is a great sense of freedom. **You don't have any like boundaries**, you're kind of free to go wherever you want.
- On a mountain bike I could be going straight down a hill and if all of the sudden I see a path on the right I can take it without signaling, **without being restricted by society's constructs** that really we live by.
- A bicycle is a **child's first form of liberty—of freedom**. And in a sense it's kind of an interesting statement, because it is one of your first true ways of **breaking away from your house**, and going places.

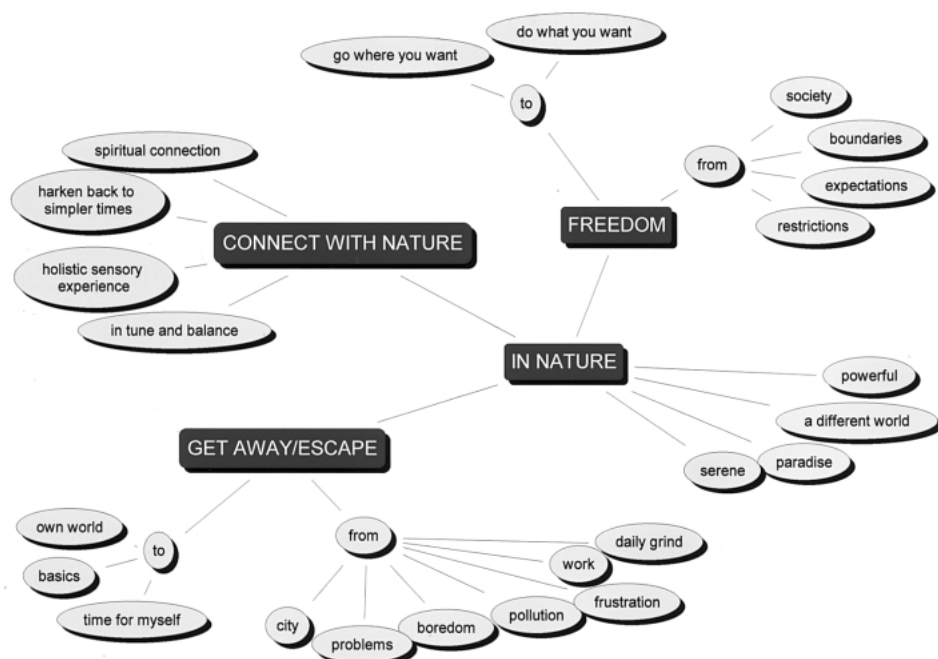


Figure 2. An anatomy map of the Escape to Nature theme.

Nature is perceived as an importance place *free from* expectations, boundaries, restrictions, constraints, and again, people. But also, in the powerful, pristine environment of nature, one is *free to* “do what you want to do,” “go where you want to go,” and “go as fast as you can.”

In summary, anatomy maps of consumers’ mental models reveal deeper understanding and produce finer distinctions regarding consumers’ meanings than does the overall consensus map. An anatomy map is like a guidebook giving interesting details about important destinations (cities) on the interstate highway map. In principle, such details in anatomy maps can be constructed for any portion of the overall consensus map. In this way, ZMET enables the researcher to dig deeper in a mental model and explore the meanings of individual constructs. This exploration process can provide important insights into constructs (such as the *to* and *from* distinction shown for the *freedom* and *escape* constructs) that will not be evident otherwise.

Toward a Deeper Understanding

In principle, any terrain (including mental terrain) can be mapped, and those maps can be at different levels of resolution—recall the metaphor of the consensus map being like an interstate highway road map identifying the main destinations and connections between them for a group of respondents. If one tried to represent every jeep trail, back road, and alleyway in the United States on a map, the map would appear completely covered in lines, rendering it uninterpretable, and not very useful. In moving to the different levels of resolution (in ZMET, this is accomplished by changing cutoff levels), fine details necessarily are foregone in the pursuit of a broader, more useful and interpretable view. But ZMET retains these fine details, which are still available in the data. Thus when important concepts on the map need deeper exploration, one can increase the resolution on a specific area of the map (by lowering the cutoff threshold) and gain a deeper understanding of that subsection. This is analogous to moving from the United States interstate highway map to a state highway map that also includes interstate highways. To demonstrate what can be learned at different levels of mapping, an example of looking deeper into the mental model of mountain biking is given.

A Finer Resolution. The present focus is the Escape to Nature theme from the consensus map in Figure 1. The cutoff level was lowered from four to three (each connection was mentioned by three or more respondents, not four as in Figure 1). Figure 3 reveals several new constructs and new connections to the focal concept compared to the original consensus map. In this case, the higher resolution revealed three new constructs. Now being *in nature* connects with important values and affective states like being *self-reliant* and being able to *express* a personal

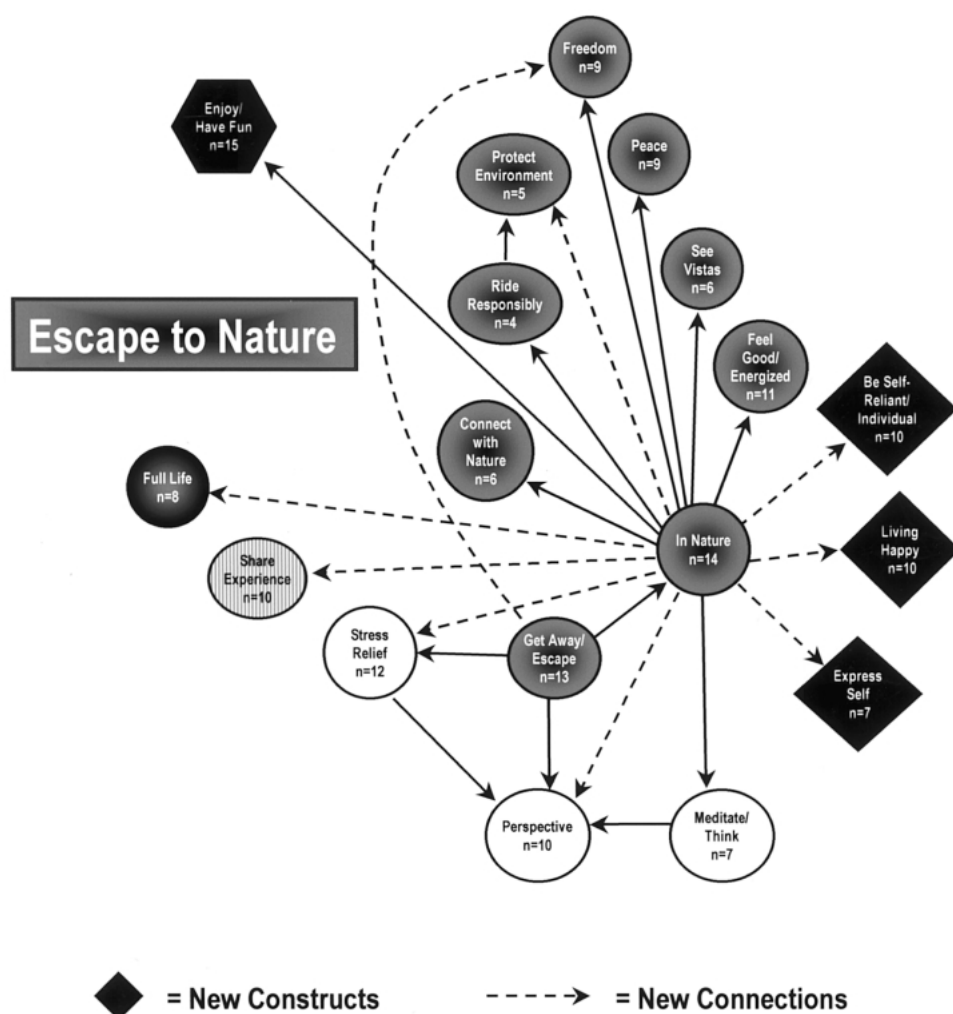


Figure 3. Mapping at a finer level of resolution.
N = 15; Connections made by 3 or more respondents

sense of *self*. Additionally, the value of happiness or *living happily* now connects to the *in nature* construct.

In addition, the higher resolution reveals *new linkages* between constructs that were on the original consensus map. For instance, the *in nature* construct now links to goal/value states such as having a *full life*, which is part of the Ride for Challenge, Thrill, and Accomplishment theme. *In nature* is also now linked to the *share experience* construct in the Sharing and Connecting theme. That is, for some mountain bikers, being *in nature* is an important *shared experience* that in turn has important superordinate desired outcomes. These meanings are not shown

on the overall consensus map, but they are revealed at a finer level of resolution.

Details such as these (and many others) are not revealed in the pursuit of an acceptable (interpretable) overall consensus map. The ZMET approach, however, is able to shift levels of resolution to explore meanings at different levels. Looking at these details can help one more deeply understand important constructs that do remain in the final version. In the present example one can see that the *in nature* construct is fundamentally important and central in the mental model of these highly involved mountain bikers, and a great deal can be learned about the meaning of *in nature*. Almost every respondent (14 of 15) talked about being *in nature* and what that meant to him or her. With the use of a level-three cutoff, 18 different constructs link to *in nature*, compared to 13 constructs on the original consensus map (a level-four cutoff). Shifting to a cutoff of two would reveal even more linkages. Obviously, being *in nature* is an important means to different social, experiential, cognitive, and emotional end states.

DISCUSSION

The goal in this article was to demonstrate that ZMET can elicit vivid and detailed meanings in consumers' mental models, some of which are deep and perhaps unconscious. It was also shown that, with the use of the ZMET analytical methods, these mental models can be mapped at different levels of resolution, thus revealing different types and levels of insights into consumers' thoughts and feelings about a topic, issue, or object. As shown in the several maps presented here, ZMET is able to tap into consumers' knowledge (both cognitions and affect) that lie well below the surface of everyday conscious awareness. Most of the constructs in these mental models express desired values, goals, or end states. Thus, these mental models (cognitive structures) can be seen as a goal hierarchy for highly involved mountain bikers.

Thematic Substructures

These mappings clearly reveal the strong themes that mountain bikers develop about the sport. For the experienced and highly involved mountain bikers interviewed, the meanings associated with mountain biking are clustered within thematic substructures that revolve around a few central, highly interconnected constructs. These themes mark different meaning orientations toward the sport and act as alternative frames of reference that organize and guide consumers' beliefs, emotions, and behaviors regarding mountain biking.

Affect versus Cognition

The maps presented here demonstrate that consumers' mental models contain both affective and cognitive meaning. Many of the constructs have a goal flavor that encompasses both affective feelings and cognitive beliefs. For example, many of the respondents hold the belief that *riding technical terrain* is a *challenge* that can help them *identify the limits of their ability*. These beliefs are represented by linkages between constructs in the consensus map and capture cognitive aspects of their mental model. But also linked directly into this cognitive structure are affective outcomes and goal states such as *thrills* and exhilarations and feelings of *satisfaction* that come from successfully navigating *challenging, technical terrain*. Many other examples of the full integration of both affective and cognitive meaning can be found in the mental model maps. As mentioned above, this conflation of affect and cognition is why the term *mental model* is preferred over cognitive structure.

Situational Specificity

It is expected that different aspects of riders' mental models for mountain biking will be activated at different times and in different circumstances. In other words, activation of mental models is strongly influenced by the immediate situation. For example, if a biker is having a particularly bad day, he or she may take a solo bike ride in to the woods in order to transform his or her affective state (goal: to feel good again and be energized). Thus, the desire for an emotional transformation is the deeper, underlying motivation for the observed riding behavior in that particular consumption situation. In a different situation, when the same biker is taking a relaxed ride with friends, the Sharing and Connecting theme may frame the rider's thoughts and feelings about the sport and motivate his or her riding.

Dimensions of Involvement with Mountain Biking

What else do these data and interpretations tell us about involvement? Quite obviously, mountain biking taps an elaborate structure of personally relevant and desired end states for these highly involved riders. The four thematic orientations shown on the consensus map identify four distinctive, yet interrelated ways that mountain bikers understand the personal relevance of mountain biking. It could be said that these thematic orientations represent four varieties of involvement with mountain biking. Thus, different riders may find mountain biking equally involving, but for different reasons.

For most riders, one of the themes is likely to dominate and thus represent that person's overall involvement with the sport across various situations. For example, some riders may be deeply into the chal-

lenge of racing, and most of their time and energy spent with the sport is motivated by the accomplishment theme. However, this thematic orientation does not preclude that, on occasion, these riders will find more involvement with the goal of Escaping into Nature in order to enjoy the peace and freedom that can result.

IMPLICATIONS AND FUTURE DIRECTIONS

Research into the meaning content of consumers' mental models about mountain biking (or any other product domain) will be relevant for marketing managers in that industry. Consider the different themes that identify broad bases for personal relevance with mountain biking—the joys of accomplishment; the feelings of connection, belonging, and group identification; the relief of transformation; and the escape to the world of nature. These thematic orientations or framings of mountain biking are powerful bases for market segmentation because they frame how consumers understand and use the product. The deeper understanding of personal relevance provided by these themes gives a practitioner a solid foundation upon which to build effective and meaningful segmentation strategies and to develop effective marketing communication practices.

The process of mapping consumers' mental models is still in its infancy. Thus there are numerous opportunities for future research to improve both the methods and interpretations of cognitive structure analysis. This article has presented one approach based on the ZMET methodology that has great promise in helping marketers dig deeper into consumers' mental models to understand the bases for their cognitive and affective responses and their overt behaviors. It is hoped that this work stimulates other researchers to improve the ZMET approach or undertake their own explorations into the world of mental models.

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