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**AN APPLICATION OF THE MEANS-END THEORY:
MEASUREMENT OF DELIVERY AND CONSUMPTION OF AN
EDUCATIONAL SERVICE**

A Dissertation
Presented for the
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville

M. Meral Anıtsal
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DEDICATION

This dissertation is dedicated to the memory of my father,
Dr. Ahmet Pasarel, who always believed that I can accomplish
anything I want.

ACKNOWLEDGEMENTS

This dissertation was a long journey that I simply would not be able to finish successfully without the help of many people. First and foremost, I am indebted to my Dissertation Committee---Dr. Ernest R. Cadotte, Dr. Sarah Fisher Gardial, Dr. Kenneth B. Kahn, and Dr. Robert T. Ladd---for their encouragement, guidance, and support throughout the process. I have greatly benefited from the discussions in our numerous individual and committee meetings about how to explore the phenomenon. I am particularly grateful to my mentor and dissertation chair, Dr. Ernest R. Cadotte.

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at the University of Tennessee. I have had a very enjoyable and challenging time in this program.

ABSTRACT

Gaining competitive advantage in today's fragmented markets is a powerful incentive for marketers to create superior customer value to. Multiple research streams were carried out to understand the meaning of customer value and determine the most effective ways to provide it. A review of the extant literature revealed that these research streams fall into in four different categories, namely cultural values of the customer, customer value as a trade off, customer value as a process, and customer value as an experience. This dissertation research focuses on the third path, which uses means-end theory to understand customer value by exploring the meanings attached to the consumption of services. . This dissertation posits that a service provides superior value to customers if it contributes more towards the attainment of customer goals more than competitors.

Although there is a great deal of research on means-end theory with products, limited empirical research has been conducted on services. Recently, some studies have been conducted using quantitative methods to explicate customer value hierarchies. However, means-end theory and its hierarchical framework of attributes, consequences and goals have not been tested using quantitative methods. This dissertation fills this gap by successfully testing the means-end theory in the context of an educational service. The hierarchical framework was analyzed using structural equation modeling to simultaneously

test the proposed four hypotheses. The fit of the model was good and all the hypothesized paths were significantly correlated.

In sum, this dissertation presents a completely quantitative approach for analyzing dominant paths among many important goals, consequences and attributes in the presence of high multicollinearity. Using this approach, it is possible to measure the types of customer value that may be created by the consumption of services and products.

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CHAPTER 1 : DEFINING THE PROBLEM

INTRODUCTION

Superior customer value is one of the most enduring sources of competitive advantage, largely because markets are growing more fragmented and customers are becoming more and more demanding (Parasuraman 1997; Slater 1997; Woodruff 1997). The empirical research regarding customer value under current market conditions is highly salient. However, there is still no common understanding of what *superior customer value* means or how to provide it.

Customers are driven by their needs and wants to seek out exchange relationships with companies that provide fulfillment (Schiffman and Kanuk 2000). Indeed, marketing is defined as an “exchange of products and services of value” between individuals and organizations (Kotler 2000). In an exchange relationship, each party “gives up of something of value in return for something of greater value” (Holbrook 1999; 1994). By its very nature, this exchange relationship puts the spotlight on the value concept regarding the marketing activities of the firm.

This reality is underscored by the American Marketing Association’s (2004) definition of marketing as the creation, communication and delivery of

value to customers. Moreover, customer value research is in the top-tier priority topics that the Marketing Science Institute (MSI) (2002) has identified. MSI has concluded that this field of study deserves concentrated and immediate research attention.

Clearly, business practitioners and academic researchers have tremendous incentives to focus on the concept of customer value, but there are a number of challenges to overcome. First, there are different definitions of customer value that may or may not be opposing at present. Second, multiple research streams have emerged, which take researchers and practitioners in different directions. Third, the need exists to go beyond exploratory research and move towards research that aims to predict and control the creation of customer value.

In this dissertation, multiple definitions of customer value will be reviewed and one consolidated definition based on means-end theory will be proposed. Means-end theory relates attributes of products or services (means) to the consumer's desired end-states (e.g., happiness, security, and accomplishment) (Gutman 1982). This theory is proving to be very helpful in clarifying many issues surrounding customer value research and management (Botschen, Thelen, and Pieters 1999; Claey's, Swinnen, and Vanden Abeele 1995; Olson and Reynolds 1983; Woodruff and Gardial 1996).

Qualitative research is the primary method for identifying means and ends. There is a need to go beyond the exploratory methods currently used in

means-end theory research by conducting quantitative studies based on large samples. Extant literature provides little guidance for conducting quantitative studies of means-end hierarchies. Therefore, this dissertation will explore the use of survey research tools in the investigation of means-end theory.

The research on means-end hierarchy will be studied within the context of a service application. Today, services dominate not only the United States economy, but also the economies of many other developed countries (Lovelock and Wirtz 2004). Services generate 81% of the gross domestic product (GDP) and 81% of the employment in the United States in 2003 (Zeithaml, Bitner, and Gremler 2006). There is a strong positive relationship between growth in per capita income and the percentage of total employment comprised by service industry jobs. The importance of services in the United States economy is expected to increase as a result.

Research on the services industry suggests that services are not like products in several ways. In particular, all services have intangible, inseparable, heterogeneous, and perishable aspects, which makes it important to focus simultaneously on specific attributes (or features) of services, the consequences of services, and the contributions of services to customer goals (Johnson, Menor, Roth, and Chase 2000). Moreover, the physical and social environments of services are difficult to design, manage and control (Bitner 2000; Griffin, Belliveau, Markham, McDonough III, Olson, and Page 1997). Griffin et al. (1997)

concludes that the existing new product development paradigm has not been applied successfully to new service development.

In this light, a second goal of this dissertation research is to quantitatively apply the means-end hierarchy to a service context in order to better understand the theoretical underpinnings of service evaluations. Perhaps understanding this process will shed new light on ways to design, control and manage better service offerings.

THE MEANING OF CUSTOMER VALUE

Organizations are increasingly encouraged to create and communicate superior customer value (Saliba and Fisher 2000; Terrill and Middlebrooks 2000; Vandermerwe 2000). However, it is not practical to do so without a good definition of customer value. At the present time, there is no consensus among researchers; there are at least four different definitions and research streams that one must consider.

In this section, the differences among these definitions are discussed, followed by the presentation of an integrative definition of customer value. Detailed discussion of each definition will follow in the second chapter.

The Definitions of Customer Value Concept and Different Research Directions

There are at least four different paths of research on customer value, and each path takes the researcher and the practitioner in a different direction. Their common ground has rarely been discussed in the literature (Reynolds and Gutman 1988; Woodruff and Gardial 1996).

The focus of the first research path is understanding cultural values (Rokeach 1973) and identifying the value systems that make macro- and micro-cultures similar or different (Holt 1997; Kahle, Beatty, and Homer 1986; Kamakura and Mezzon 1991; Kamakura and Novak 1992; Thompson and Troester 2002). The researchers on this path do not elaborate on how customers interact on a day-to-day basis with companies within the same macro- or micro-culture or how their consumption experiences relate to their cultural value systems.

Rokeach's (1973) seminal study measured cultural values in terms of the relative rankings of items for different cultures and countries (Johnston 1995; Kamakura and Mezzon 1991; Kamakura and Novak 1992). Although cultural values form a basis for individual goals and purposes, their impact on the daily consumption activities of individuals is not easy to discern. Because these values are not related closely to the life's major roles such as marriage, parenting, work, leisure and daily consumption, it is difficult to find the links between cultural

values and their implementation on life's major roles (Kahle, Beatty, and Homer 1986). Consequently, cultural values theory has not been widely applied by practitioners.

The second research path is concerned with customer value in terms of *give* and *get* components. Customer value is defined as a trade-off between what customers receive and what they give up (Caruana, Money, and Berthon 2000; Jensen 2001; Slater and Narver 2000; Zeithaml 1988). However, the focus is on the overall evaluation and the sum of the *give* and *get* components, rather than how customers weigh different end-states in different situations. Moreover, it does not capture the dynamic nature of the evaluation in terms of changing goals and consequences that customers want to experience. The researchers that follow this second path do not discuss goals, end-states, or consequences. The *gives* and *gets* are typically measured by means of an overall self-report evaluation such as "whatever I get from XYZ Company for the price I pay" (Caruana, Money, and Berthon 2000; Zeithaml 1988).

Researchers that follow the third path consider customer value as a process (Reynolds and Gutman 1988; Woodruff and Gardial 1996), focusing specifically on attributes of products or services, consequences of their use, and end-states that customers desire to achieve. This path portrays a hierarchical structure leading from attributes to consequences to end-states. This research is focused primarily on the consequence-attribute interaction--that is, how product

and service attributes relate to their consequences as experienced by the customer (i.e., benefits and sacrifices). Although researchers discuss the *value in use* and *possession value* of services and products, they are less likely to elaborate on the interactions among their attributes at the desired end-state/goal level. This last topic will be discussed in Chapter Two.

The third path differentiates between consumption goals as low-level desired end-states and cultural values as high-level desired end-states. Although many values transcend culture (Rokeach 1973), different types of end-states or goals and how they relate to each other have not been adequately addressed.

Means-end theory has developed primarily through qualitative research tools and techniques. The analysis of data that is obtained by laddering includes quantitative steps, but at its core, it is based on the qualitative technique of probing. This special technique of collecting and analyzing data has been very successful in helping researchers to understand the process of how customers relate attributes to consequences to end-states using small samples. However, researchers and practitioners are reluctant to make market-wide projections based on qualitative techniques like laddering and judging. These techniques are cumbersome and expensive to use with large samples (Botschen and Hemetsberger 1998; Botschen, Thelen, and Pieters 1999; Valette-Florence and Rapacchi 1991).

Researchers who take the fourth path consider customer value a matter of

personal experience (Holbrook 1994). Customer value is defined as an overall evaluation of the product or service in a consumption experience situation.

Holbrook, in particular, offers a typology of various consumer values along six different dimensions, namely extrinsic, intrinsic, self-oriented, other-oriented, active, and reactive values (1994). The discussion of these value dimensions has similarities to that of *value-in-use* and *possession value* along the third path.

However, Holbrook (1999) does not discuss the customer value concept in a hierarchical manner. Consequences and attributes are not included at all.

Nevertheless, it is important to understand that desired end-states in the means-end hierarchy and value dimensions in Holbrook's typology have various elements in common.

Researchers and practitioners have a limited understanding of how to measure quantitatively the attainment of end-states. Holbrook's theoretical discussions (Holbrook 1999; 1994) offer no guidance for quantitative research.

Integrative Definition of Customer Value

To consolidate the research discussed above, the following definition of customer value will be used throughout this dissertation: *the value of a product or a service to a customer is the degree to which it contributes towards the attainment of the customer's desired end-states/goals.*

Because end-states operate at the highest level of means-end theory, this definition is an extension of that theory. Ultimately, researchers and practitioners need to be aware of not only how a product or service contributes to a desired end-state but also to what extent the attributes and their consequences are perceived as being in the path towards the goal. A key premise of Holbrook's typology is that culture shapes the individual's desired end-states, either directly or indirectly (1994). Other end-state typologies may apply in this context as well.

There are at least two corollaries to this definition that are relevant to this discussion. The first corollary to the above definition is that

- *a service provides superior value if it contributes towards the attainment of the customer's desired end-states more than competing products/services.*

The second corollary is that

- *a service may contribute to or detract from one or multiple end-states.*

Therefore, estimating the net contribution of a product or service towards an individual's overall end-state is theoretically possible.

The above definition and its corollaries integrate prior research on customer value and provide directions for future research on new product/service design and management. This definition will enable researchers and practitioners to measure the extent of which a product or a service helps them to attain (avoid) various desirable (undesirable) end states/goals. This

definition acknowledges that there may be a complex set of end states/goals that customers want to attain in their life roles. It is possible that end states/goals influence the achievement of other end states/goals. For example, a “weight-loss” goal may be triggered simultaneously by “protecting heart” and “looking good” goals. Hence, a pre-imposed ranking of end states/goals are avoided in this definition. In the current research, Holbrook’s six dimensions (self-oriented, others-oriented, extrinsic, intrinsic, active, and reactive) were used as a guide to identify various end states/goals that may be influential in different use situations.

In that sense, this approach integrates different paths of customer value research. Rokeach’s (1973) list of values can be embedded into Holbrook’s dimensions. For example, a comfortable or exciting life can be considered in self-oriented value dimension and family security and social recognition are clearly in the others-oriented dimension of the typology. Similarly, a research path defining value in terms of *get* and *give* component can be a special case in extrinsic dimension.

While Holbrook’s typology provides guidance at the end state/goal level, it does not link end states/goals to product and service features. Researchers must discover these linkages. That is, researchers must investigate which aspects of the service contribute the most to the achievement of goals, in other words, the link between product/service attributes and consumption experience.

Finally, the above definition can help to operationalize the value definition introduced by the researchers in path three. It can be stated as “the customers’ perception of what they want to have happen in a specific use situation with the help of a product or service offering, in order to accomplish a desired purpose or goal (Woodruff and Gardial 1996, p54)”.

Research Objective

The overall objective of this dissertation is to apply the means-end hierarchy to a quantitative study of customers’ evaluations of a service in terms of its utility for attaining desired end-states/goals in a holistic manner. Thus, the quality of service attributes and their positive or negative consequences will be evaluated in relation to end-states/goals. For the purpose of this research, the desired end-states/goals are limited to the six types defined by Holbrook (1994), namely self-oriented, other-oriented, active, reactive, extrinsic, and intrinsic (Figure 1-1).

The focus of this dissertation is limited to the customer value hierarchy for a specific use situation within a single culture and does not include a discussion about the impact of cultural values. At the highest level of end-states (cultural values), extensive and long-lasting changes do not happen frequently (Rokeach 1973), and one may assume that individuals become aware of their specific cultural values when a

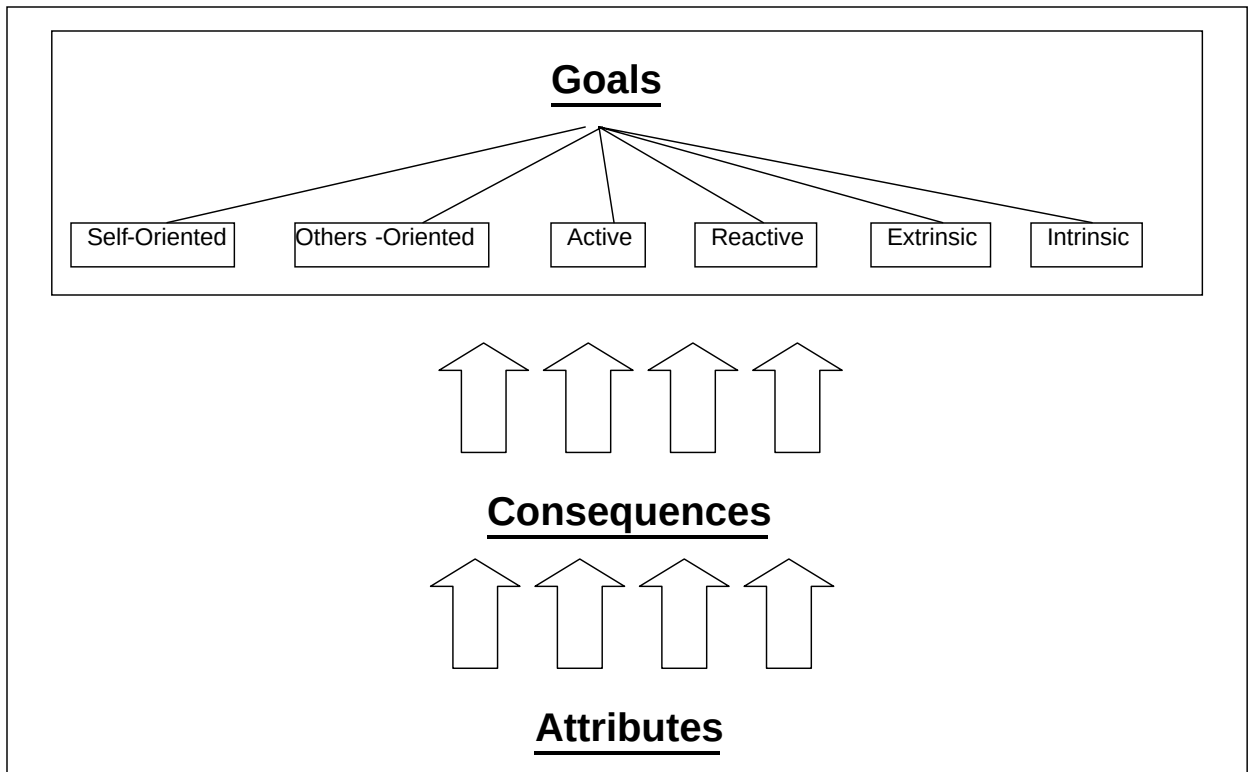


Figure 1-1 A Means-End Hierarchy Model with Six Types of Goals

significant event happens or when that individual experiences a different culture firsthand. Therefore, observing changes in the cultural values of respondents within the constraints of this dissertation seems unlikely.

SERVICES MARKETING:

As a Context of an Application of Means-End Hierarchy

As the service industry grows more dominant in Western economies, the development and management of successful services and research on services

marketing-related topics gain even greater importance than before.

Apparently, the methods used to manage product quality are not fully applicable to the development of services quality (Parasuraman, Zeithaml, and Berry 1985; Rust and Oliver 1994). According to Johnson et al. (2000), this phenomenon is due to the fact that services have unique characteristics, including intangibility, inseparability, heterogeneity, and perishability (Zeithaml, Parasuraman, and Berry 1985). *Intangibility of services* means that services cannot be stored, protected through patents, displayed, or communicated readily. *Inseparability of production and consumption* means that the customer is involved with the service at any stage, usually in the presence of other customers. This condition makes centralized mass production of services difficult. *Heterogeneity* refers to the potential of high variability in the performance of service employees and customers, which makes standardization and quality control difficult. Finally, *perishability* refers to the fact that services cannot be inventoried. For instance, an empty room in a hotel cannot be reclaimed. In addition, services may be highly customized. Many service design elements “get finished” at the last moment for a specific customer and the results may be completely different from one transaction to another.

All of these characteristics make it difficult to precisely associate direct and indirect costs with the provision of a service. These factors also have an impact on the management and continuous improvement of existing services.

Among all of the characteristics of services that set them apart from products, the simultaneity of the production and the consumption of the service is the most critical one for managing services. Most of the time, the customer contributes to the production of the service by simultaneously experiencing or consuming it. Therefore, it is essential to incorporate the consumption experience into the design and management of services. However, existing research avenues both in services marketing and customer value traditionally focus on the trade-off between price and service attributes and are not geared towards dealing with consumption experience (Zeithaml 1988). On the other hand, the hierarchy perspective can incorporate situational influences on the consumption experience.

Proper control of service quality is another challenge for service providers. In the service encounter, customer presence during the production and consumption of service, as well as the existence of employee and customer interaction, make service quality something that is more “perceived by the customer” than measured by the producer, i.e. more subjective than objective. Manufacturers use rigorous, statistically controlled quality control systems to test and validate new product designs. They also use these measurement techniques to assure product quality during the commercialization process.

Services have two quality dimensions--technical and functional. The *technical characteristics of service quality* are defined as “What customers receive in

their interactions” with a service firm (Gronroos 2000, p.63). Technical characteristics of services are analogous to the technical specifications of products, and they include location, number of employees, type of technology used, and layout of the service facility. These characteristics are solely designed or organized by the service provider. *Outcome quality* is another term used to describe the technical dimension of service quality.

How customers receive and experience the service relates to the functional characteristics of the service process. Gronroos (Andreasen 1962; 2000, p.64) defines *functional characteristics of service quality* as “how the moments of truth of the service encounters themselves are taken care of and how the service provider functions. This dimension deals with consumption experiences such as whether employees use their own initiative for customization, how technology is tailored to the specific needs of the customer, how waiting time is managed during service delivery, and how customers are treated. In addition, customers directly impact the manner in which they receive and experience the service. Service employees and customers together produce the functional characteristics of the service.

Functional characteristics of services are very difficult to control, since the co-production by employees and customers introduces variance. Service providers that want to reduce variance should focus on both functional and technical characteristics. Even if the service provider rigorously controls the

service encounter with carefully written scripts, the same customer may respond differently on different days or occasions of consumption (heterogeneity). This variance may influence perceptions of service quality.

Simultaneous control of technical and functional characteristics of a service during the design and implementation processes is critical. Both functional and technical aspects should be streamlined in managing service quality. Usually, service providers focus on the design and management of technical and outcome-related aspects of the service quality. How to manage functional and process-related aspects of the service quality is not clear cut.

The concept of customer value as an overall trade-off between benefits and price answers to the needs of technical aspects of the service, but it does not incorporate the customer's experience (functional aspects) of the service or what the customer ultimately achieves. This approach hinders the understanding of how specific attributes lead to consequences that, in turn, lead to the achievement of important goals. The means-end hierarchy of customer value, on the other hand, may be instrumental in designing both the technical and the functional characteristics of services. This hierarchy incorporates attributes associated with the service, consequences experienced by the customer, and goals related to the consumption of the service. Both *what customers receive* as a service and *how they receive it* can be considered simultaneously (Figure 1-2). In order to illustrate technical and functional characteristics of service, a

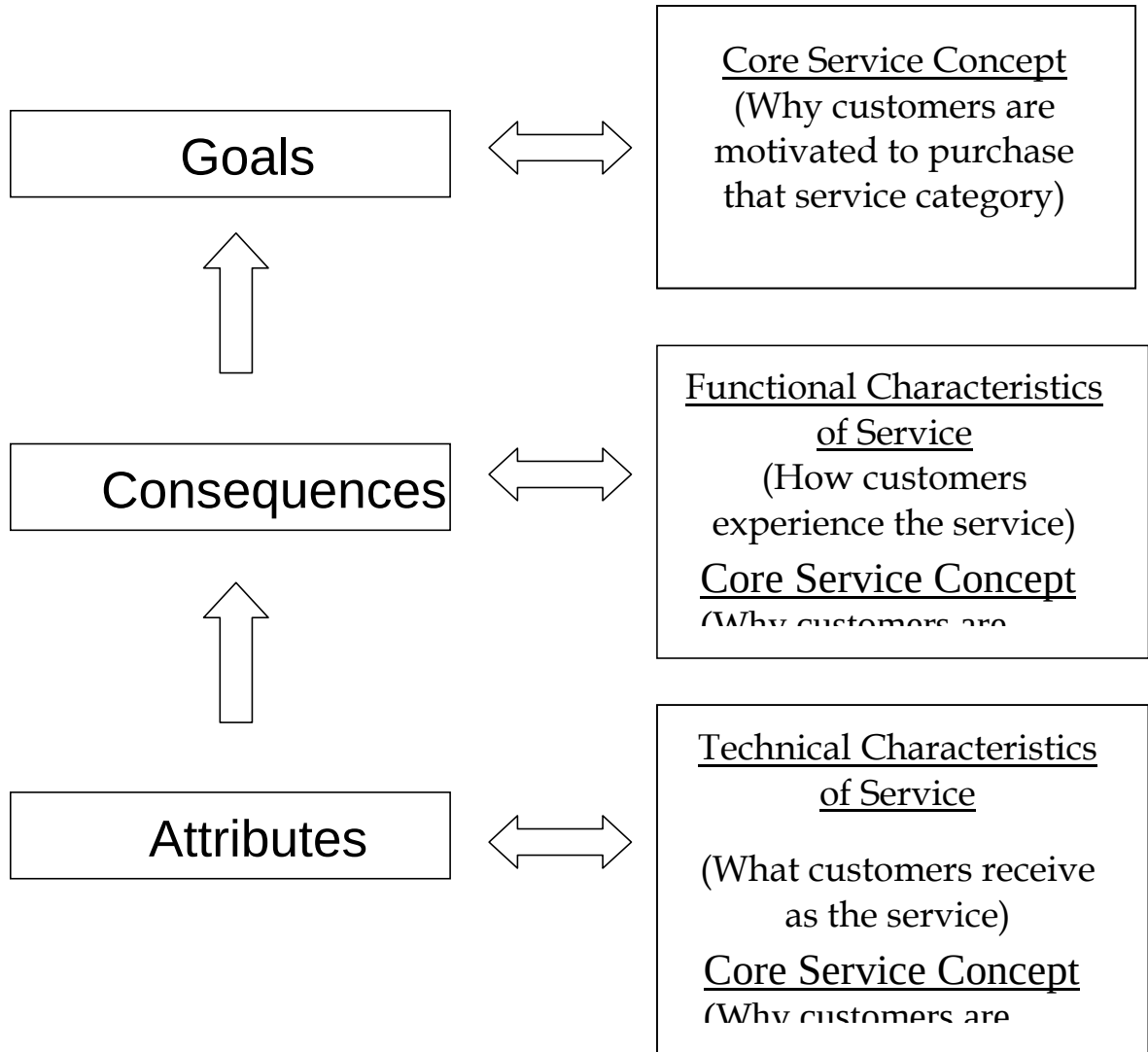


Figure 1-2 Means-End Hierarchy and Functional and Technical Characteristics of Service

timeshare offering will be examined. Timeshare is the fastest growing sector of the worldwide hospitality industry (Anitsal and Anitsal 2004). Timeshare ownership traditionally provides one with an opportunity to purchase a fully furnished and well-maintained vacation accommodation for only a certain period of time, usually in weekly intervals per year. The customer pays only a certain percentage of the cost of a full ownership of a resort room or suit. The owner will contribute to the maintenance expenses of the resort unit in proportion to his ownership, but does not need to worry about any actual maintenance activity. In return, the owner will have the right to use the resort room on a certain week of a year for a pre-specified time such as 30 or 60 years.

Traditional timeshare offerings have kept changing over the past 40 years in keeping with the changing needs of customers. Customers, now, demand more flexibility of exchanging their weeks and resorts around the world on a yearly basis. Some of the technical and functional characteristics of timeshare offers can be summarized in Table 1-1. Technical characteristics include what's available for the customers' use in and around resort. Usually resorts provide amenities (some are listed in the table) and let the customers take care of themselves and their time in the resort. A customer may have a fully equipped room/suit, but has to clean it, buy supplies and wash dishes and linen. Similarly, pool or recreation area may be available for customers use, but they need to find activities to do there by themselves.

Table 1-1 An Illustration of Technical and Functional Characteristics: Timeshare Resorts

	<i>TECHNICAL CHARACTERISTICS</i>	<i>FUNCTIONAL CHARACTERISTICS</i>
<i>Room/Suit Related</i>	Number of bed rooms Size of bed Whirlpool Kitchen (full, mini) Air condition Color TV Video/DVD Player/ Cable Washer/Dryer Dishwasher Vacuum cleaner	How often is the room cleaned? How often are the linens changed? Do employers or customers clean the room? Do supplies automatically replaced by the resort?
<i>Resort Related</i>	Swimming Pool Recreation Building/Room Golf Course Beach Sauna	Are personal trainers available and provide customized routines? Daily animation program including fun games and activities Kids Club activities Programs for beach lovers/ golf players On site sports competitions Bingo nights/ disco nights
<i>Surrounding Area Related</i>	Shopping Dining Local attractions	Organized shopping trips Organized trips to nearby historical areas, nature trails Special discounts to resort customers for dining, shopping etc.

Source: Anitsal and Anitsal 2004

Trends indicate that (Baumann 2001; Blank 2003) the most popular resorts are the ones that design vacation experience for their customers free of charge or for a reduced fee. These vacation experiences may include a multitude of organized activities that help customers to become familiar with other customers while enjoying the unit, resort or surrounding area. Some examples include daily animation programs such as contests, games for all ages, sports activities, shopping trips, and dining and dancing activities. It seems that the features/amenities of the resort and unit (technical characteristics) have been the expected standard, but activities (functional characteristics) that are geared towards how customers enjoy their resort time have become the delighting aspect of the service.

RESEARCH PURPOSE

The purpose of this research is to understand and explain the hierarchical process of the delivery and consumption of a service by applying means-end theory. Toward this end, the hierarchical structure of the service attributes, desired consequences and end-states will be evaluated in a quantitative study. In addition, the author hopes to predict consumers' behavioral intentions using the different types of goals (end-states), consequences, and service attributes as independent variables. Finally, the hierarchical customer value maps of different

customer groups will be compared and contrasted to discover how exogenous variables affect the customer value hierarchy maps.

RESEARCH QUESTIONS

1. Is it possible to employ quantitative research methods to discover relevant attributes, consequences and goals within a means-end hierarchy structure? Qualitative research supports the validity of this structure (Botschen and Hemetsberger 1998; Flint, Woodruff, and Gardial 2002; Reynolds and Gutman 1988; Valette-Florence and Rapacchi 1991; Zeithaml 1988). Are these linkages quantifiable using standard statistical tools such as regression analysis and/or structural equation modeling? Is it possible to find a dominant significant path from important attributes to relevant consequences to specific goals?
2. Can quantitative research techniques be used to identify differences between customer value hierarchies of experienced and inexperienced customers of the same service?

IMPLICATIONS FOR RESEARCHERS

This study focuses on the measurement of customer value and strives to extend the body of knowledge about customer value and means-end theory, as well as services marketing. Furthermore, the methods developed for this study may be instrumental in formulating customer value hierarchies for other products and services in specific use situations. Currently, customer value research depends heavily on in-depth interviewing techniques to discover the customer's evaluations of customer value (Reynolds and Gutman 1988). Qualitative techniques, such as in-depth interviews and focus groups attempt to explore and understand, rather than predict, customer evaluations, and they rely on small samples of respondents. The results of qualitative studies with small samples are not generalizable to larger populations (Calder, Phillips, and Tybout 1982; Cook and Campbell 1979; McGrath and Brinberg 1983). This limitation inhibits the usefulness of means-end hierarchy research for enhancing customer value theory. Numerous researchers (Flint, Woodruff, and Gardial 2002; Parasuraman 1997; Slater 1997; Slater and Narver 2000; Woodruff 1997) have encouraged both scholars and managers to focus on customer value creation and management. However, the enhancement of customer value research requires quantitative as well as qualitative tools. The current study attempts to address this measurement challenge.

The ability to measure customer value hierarchies opens up new avenues for predicting changes in customer value. As a future research avenue, it may be possible to expand this research into a longitudinal study that explores how customer value hierarchies change as customers gain more experience with a service/product. Once the researcher identifies dominant paths connecting attributes, consequences, and end-states within a specific service/product use situation, she may be able to find the triggers that lead to change in what customers find valuable. This measurement tool might be used to explore the relationship between customers' preferences for desired value (what customers want to have happen when interacting with a supplier and/or using the supplier's product or service (Flint, Woodruff, and Gardial 2002, p.103) and their evaluations of what they receive.

The concept of customer value hierarchy that operationalizes the attainment of goals through the use of a product or service may also have an important impact on the diffusion of innovation. Although the literature in this area mentions *relative advantage* (Rogers 1995; Rogers and Singhal 1996), this concept is usually operationalized by way of product/service attributes. Extant research does not consider the consequences of attributes or the goals associated with adopting an innovation (Flora, Jatilus, Jackson, and Fortmann 1993; Goldman 1992; Moore and Benbasat 1991; Tornatzky and Klein 1982).

The quantification of means-end hierarchy may be instrumental in predicting the likelihood of adopting one specific innovation over another based on their ability to generate desired end-states or avoid undesired ones. Quantitative customer value analysis can also be explored in non-adoption situations. As such, evaluating the customer value hierarchy maps of two substitute services, as an extension of this study, may give some idea about their relative desirability among customers.

IMPLICATIONS FOR MANAGERS

Griffin et al. (1997) indicates that new service designers have difficulty understanding what customers want, even when they incorporate the voice of the customer in their design process. This may be true because customers keep their goals in mind as they experience the consequences of the new service, while service providers tend to focus more on the attributes of the services. This study should help managers think through the delivery of a service from attributes to consequences to customer goals.

Understanding the hierarchical maps of customers may help managers develop processes for designing functional characteristics (how customers will experience the service) as well as technical characteristics (what customers will receive as a service). Quantifiable hierarchical maps should give managers ideas about the attributes and consequences of a service that are most important in

their customers' lives. In this way, they will be able to better focus their limited resources to serve customers better.

The hierarchical mapping of service should also help managers identify numerous customer groups having different goals and values that motivate them. As a segmentation tool, this knowledge may allow managers to develop different pricing, distribution and communication strategies. Once the groups of customers are identified, managers may be able to tie specific attributes to desired consequences.

Finally, a future extension of this study may involve comparing and contrasting the hierarchical map of a new service to available substitute services. This comparison should provide managers with invaluable information about how their service satisfies the customer's needs relative to the competition.

ORGANIZATION OF THIS DISSERTATION

This dissertation proposal consists of three chapters. Chapter One provides an overview of the domains of customer value, means-end hierarchy, and services marketing and introduces the research problem investigated in the dissertation.

Chapter Two reviews the extant literature on customer value, giving special attention to research relevant for the development of different types of

value. Also, this chapter describes the current state of means-end hierarchy theory, and development of quantitative methods within the theory. This chapter also presents research hypotheses.

Chapter Three explains the methodology proposed used in this study and presents the logic behind the survey research design and analysis. The chapter restates the theoretical hypotheses to be tested and discusses the measurement instrument to be used. The outline of the methodology in terms of scale development, and pre-test data analysis is also described in detail in this chapter.

Chapter Four will provide an analysis and discussion of the results of the main study. Analyses of validity and reliability will be presented, along with the results of the structural equation modeling of theoretical linkages.

Finally, the implications of this study, for marketing researchers and practitioners, the limitations of its methodology, and future research programs will be discussed in Chapter Five.

CHAPTER 2 : REVIEW OF THE LITERATURE

In this chapter, published research is reviewed in order to establish the theoretical foundation for a proposed study and application of means-end theory within the context of delivery and consumption of a service. A detailed investigation of the customer value concept in the existing literature and a discussion of the current state of means-end hierarchy theory are provided. Methodological developments within this theory discussion receive special attention. Research hypotheses are also developed in Chapter Two.

THE CONCEPT OF CUSTOMER VALUE

The concept of customer value has been discussed in a variety of ways and meanings in the literature since 1970s. these discussions can be classified under four categories or paths based on how they define customer value; namely cultural values, customer value as a trade-off, customer value as a process, and customer value as an experience. Although it has not been explicitly stated in these paths, the value concept has been used to mean either *a person has values (or value system)*¹ or *an object has value* in the literature. The following section reviews how each path defines customer value and in which meaning (a person has value

¹ A person has values (value systems) will be referred as “person-value” and An object has value will be referred as “object-value”.

or an object has value) each research path uses it.

Research Path One: Cultural Values

In his influential study of the nature of human values (versus product/service value), Rokeach (1973) states that the value concept is different from other concepts such as attitude, social norm, and need, yet systematically related to them. He identifies five assumptions about the nature of human values: “(1) The total number of values that a person possesses is relatively small; (2) all men everywhere possess the same values to different degrees; (3) values are organized into value systems; (4) the antecedents of human values can be traced to culture, society and its institutions, and personality; (5) the consequences of human values will be manifested in virtually all phenomena that social scientists might consider worth investigating and understanding” (Rokeach 1973, p. 3).

For the present discussion, *value* refers to the term “*a person has a value*”. In other words, a person-value is “an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence” (Rokeach 1973, p. 5).

A value system is an enduring organization of beliefs about preferable modes of conduct and existence. Culture is learned and shared. Once a new value is learned, it is integrated into an organized system of values. Different

types of values are ordered in importance with respect to one another in a person's value system (Gutman 1982).

Preferable modes of conduct and existence are often molded by the culture in which a person lives. People react to their environments based upon the cultural framework that they bring to any experience and perceive the world through their own cultural lenses (Ueltschy and Krampf 2001). Therefore, the value definition above may be regarded as cultural values that a person shares with his society. These values are highly abstract, centrally held, enduring beliefs or end-states of existence that members of a society seek to achieve through their behavior (Baker and Knox 1995).

Although Rokeach claims that values guide human actions in daily situations, there is no direct connection between values and consumer choice behavior in this path of research (Gutman 1991). Rokeach suggests two types of values--terminal and instrumental. Beliefs concerning desirable end-states of existences are terminal, and beliefs concerning desirable modes of conduct are instrumental. Terminal values may be self-centered, society-centered, intrapersonal, or interpersonal. Rokeach does not make an immediate connection between instrumental or terminal values and consumer choices. He assumes that terminal values and instrumental values are two separate yet functionally interconnected systems. Desirable modes of conduct are instrumental to the attainment of desired end-states of existence. However, he does not develop

mechanisms to translate instrumental or terminal values into choices of products or services to satisfy these values (Gutman 1982).

Cultural values research focuses on a determination of values that characterize the similarities and differences among various cultures in terms of the rank order of these values (Johnston 1995; Kamakura and Mezzon 1991; Kamakura and Novak 1992). However, pre-established lists of values have been found to be cross-culturally invalid (Baker, Thompson, and Engelken 2004). Within a culture, most members may agree upon the values that are important to them, but there may be vast differences between cultures (Baker, Thompson, and Engelken 2004). Observing differences in values and choice behavior simultaneously may be easier in a research setting that compares and contrasts two different cultures than investigating the immediate impact of cultural values on the choice behavior within a culture.

Research Path Two: Customer Value as a Trade-Off

While the first path uses the value concept to mean “a person has values”, the second path uses the value concept to mean *the object has the value* (de Chernatony, Harris, and Dall'Olmo Riley 2000; Gronroos 1997; Sinha and DeSarbo 1998; Zeithaml 1988). Zeithaml (1988) points out that consumers find object-value in a wide variety of attributes of a product or service. They are also able to reach higher levels of abstraction in what they think is valuable in a

product or service, a phenomenon that causes considerable difficulty in conceptualizing and measuring the value construct in research.

Value is low price is identified first among the four definitions of value that consumers use in Zeithaml's research (1988, p 13). Although price is an important variable, consumers do not always purchase the lowest-cost product or service (Cronin, Brady, Brand, Hightower, and Shemwell 1997).

The definition *value is whatever I want in a product* is more abstract than *value is low price*, and it is similar to the definition of utility as a subjective measure of usefulness. *Utility* covers the low price aspect of the first value definition and has qualitative and quantitative dimensions as well as subjective and objective factors that encompass all relevant choice criteria.

Zeithaml's third definition, *value is the quality I get for the price I pay*, introduces the idea of comparison. However, consumers do not always buy the highest quality service or product per se (Cronin, Brady, Brand, Hightower, and Shemwell 1997).

The fourth definition identified in Zeithaml's research, *value is what I get for what I give*, is a more abstract form of the third definition. This meaning of value is consistent with the utility per dollar measure of value used by Urban and Hauser (1993), who recommend the inclusion of value in new product and service design programs.

Based on these value definitions of consumers, Zeithaml states that “perceived value is the consumer’s overall assessment of the utility of a product based on perceptions of what is received and what is given” (Zeithaml 1988, p 14). Other contributors to this path of research conceptualize value as an overall trade-off between the relevant “gives or sacrifices” and “gets or benefits” (Caruana, Money, and Berthon 2000; Cronin, Brady, and Hult 2000; Cronin, Brady, Brand, Hightower, and Shemwell 1997; de Chernatony, Harris, and Dall’Omo Riley 2000). The sacrifice component of value includes monetary and non-monetary prices that a consumer is willing to give. The benefits components of value include intrinsic and extrinsic attributes of a service or product as well as perceived quality. Jensen (2001) points out the ambiguousness of this definition, as it relies on other terms such as *utility*, *worth*, *benefits* and *quality*, which are too often not well defined (Parasuraman 1997). This path of research does not address the issue of whether or how a change in a person’s value system influences the perceived value of the object that that person owns.

Research Path Three: Customer Value as a Process

This research path extends the customer value research into means-end hierarchy. The third major path of value research defines value as “... the customers’ perceptions of what they want to have happen (i.e. the consequences) in a specific use situation, with the help of a product or service offering, in order to accomplish a desired purpose or goal (Woodruff and Gardial 1996, p54)”. This

definition indicates that products/services are means to achieve desired goals. Value comes from possessing (“possession value”) and using (“value-in-use”) products or services. This path also uses the value concept to mean *the object has the value*. However, researchers on this path acknowledge that individual values have an impact on the value of the object.

This research path focuses on understanding the consequences, both desired and undesired, of using products. As use situations change and time passes, the salience of certain consequences change (Flint, Woodruff, and Gardial 2002). This path does not elaborate in detail about the question of how *person-value* influences *the object-value*.

At the goal level, these researchers discuss value-in-use and possession value. Value-in-use is the functional outcome of the consumption experience, such as increased productivity, decreased time and cost, better ease of use, improved reliability, etc. Possession value, on the other hand, comes from symbolic, aesthetic and expressive qualities associated with the product. Individuals may experience pride of ownership or usership while consuming these products and services. A product/service may have value-in-use and possession value simultaneously.

The consequences are “outcomes that are experienced by the customer as a result of product use” (Woodruff and Gardial 1996, p56). Products/services are means to attain goals that individuals set. Through experience, individuals learn

how to relate consequences of their actions (negative or positive) to goals they want to achieve (Bagozzi and Dholakia 1999). As a result, value is the “trade-off between the positive and negative consequences of product use as perceived by the customer” (Woodruff and Gardial 1996, p57). The trade-offs of consequences dictate the extent to which the customer achieves their goals.

The value judgments as consequence trade-offs are influenced by users’ values/goals, use situations and product/service attributes. Therefore, unlike the overall value evaluation based on trade-offs at the attribute level proposed in the previously discussed research path, this research posits a continuous process of value judgments based on trade-offs at the consequences level.

Research Path Four: Customer Value as an Experience

Holbrook (1999, p5) defines customer value as “an interactive relativistic preference experience”. This definition incorporates “the evaluation of some object by some subject” In other words; the consumer of an offering evaluates objects such as products, services, political candidates, music concerts, vacation destinations, social causes, etc. This definition also uses the value concept to mean *the object has value*. His discussion on the nature and types of customer value draws attention to the interactive nature of the value concept. Moreover, he argues that without the involvement of the customer who experiences and appreciates the characteristics of the object (for example a haircut service), the object will have no value.

Another important aspect of this interpretation of customer value is its relativistic nature. Customer value is comparative in the sense that it involves relative preferences among alternative objects. The value of an object must be assessed and stated relative to the competition (Woodruff and Gardial 1996).

Customer value is personal and situational. It varies across individuals. An object that is very valuable to one individual may mean nothing to another individual. Individual differences may be due to experience, personality, education or culture. This path of research implies that *a person- value* influences the customer's understanding of *the object-value*. Richins (1994) states that objects have private and public meanings acquired by the consumption experiences associated with these objects. Although little is known about how these meanings develop, cultural norms and value systems may contribute to their cultivation.

Finally, Holbrook suggests that customer value is situational. Use situations influence the value of the object. The evaluation judgments about the value of an object are context-dependent. For example, customers may not tolerate waiting more than five minutes for fast food service; however, they usually expect to wait longer at a fancy restaurant (Leclerc and Schmitt 1999).

This research path supports the claim that objects provide need- or want-satisfying experiences. Hence, the value resides in the experiences created by the consumption of these objects, not in the product or service purchased, brand

chosen or object possessed (Holbrook and Hirschman 1982). Individuals seek satisfying experiences that they can achieve by possessing and consuming products and services. This path does not elaborate on how to relate attributes of products and services to desired and satisfying experiences. Instead, it suggests ways to classify the various types of value obtained as a result of various consumption experiences. This classification considers value at the level of end-states, which is the highest level of abstraction.

The consumer value typology consists of the key dimensions of extrinsic/intrinsic, self-oriented/other-oriented, and active/reactive value (Table 2-1). Holbrook conceptualizes each of these dimensions as lying on a continuum where opposites are polar extremes which rarely exist purely in isolation from each other. Moreover, he suggests that each product or service offers each type of value to some degree; however, one type of value may dominate a consumption experience. For example, dishwashers may primarily have extrinsic value, whereas clothes might primarily have other-oriented value.

Extrinsic value relates to the utilitarian and functional aspects of consumption experience, while intrinsic value relates to the appreciation or enjoyment of the experience for its own sake. Extrinsic value is utilitarian, instrumental and practical in the sense that an object has the capacity to produce consumption experiences that are used to generate some other outcome.

Input/output aspects of extrinsic dimension may be related to time, money, and

Table 2-1 A Typology of Consumer Value

		<i>EXTRINSIC</i>	<i>INTRINSIC</i>
SELF-ORIENTED	ACTIVE	EFFICIENCY (OUTPUT/INPUT, CONVENIENCE)	PLAY (FUN)
	REACTIVE	EXCELLENCE (QUALITY)	AESTHETICS (BEAUTY)
OTHERS-ORIENTED	ACTIVE	STATUS (SUCCESS, IMPRESSION MANAGEMENT)	ETHICS (VIRTUE, JUSTICE, MORALITY)
	REACTIVE	ESTEEM (REPUTATION, MATERIALISM, POSSESSIONS)	SPIRITUALITY (FAITH, ECSTASY, SACREDNESS, MAGIC)

Source: (Holbrook 1999).

effort spent to obtain intellectual or physical gains or experiences. Intrinsic value, on the other hand, is associated with sheer enjoyment of an experience, regardless of the outcome. In this case, hedonic satisfaction is the intrinsic value of the consumption experience (Holbrook and Hirschman 1982). The enjoyment of fun and play are clearly part of the intrinsic dimension.

Self-oriented value arises when an individual seeks a consumption experience solely for the effect it has on him/her. The value drives from the degree to which the experience serves the egoistic pursuits of the individual. In self-oriented value, the self, rather than society, is the focus of the consumption

experience. Ego and self-actualization can be considered as examples of self-oriented dimension, as self-interested or prudential considerations. In contrast, other-oriented value looks beyond the self to the impact of the individual's consumption experience on important others (e.g. family members, friends, neighbors, society, country). It is about paying attention to the forces that apply restrictions on a person other than self, such as esteem and status.

Active (versus reactive) value comes from consumption experiences in which the consumer manipulates a tangible or intangible thing, while reactive value comes from passive appreciation and admiration of what the object does for the consumer. Active value arises from the consumer's control of the object or situation to suit his/her liking. Control and expertise are examples of active dimension where the person dominates and controls objects or situations as s/he had the necessary skills to do so. Reactive value arises from the consumer's interaction with the object or situation as the audience, receiver or viewer of the consumption experience. In this dimension, a person simply depends on others' competence to achieve certain objectives and appreciates their competence to help her/him out.

Interactions among these dimensions are suggested in the customer value typology. For example, efficiency and convenience are the outcomes of extrinsic, self-oriented, and active dimensions whereby an individual actively seeks to maximize self-enhancement. Similarly, fun and play are outcomes associated

with intrinsic, self-oriented and active dimensions.

The dimensions of Holbrook's consumer value typology may provide a good framework for understanding the interaction of *person-values* and *object-values*. Richins (1999) calls attention to the cultural factors that influence the use of products/services to express identity. She states that other-directedness correlates strongly with materialism, which leads individuals to seek social environments that support their advancement in business, politics, and social life. Rokeach (1973) identifies social recognition as a terminal personal value. However, the dimensions of the consumer value typology have not been thoroughly and holistically tested yet. The only known exception is a study by Mathwick et al.(2001) investigating the extrinsic/intrinsic and active/reactive value dimensions.

The consumer value typology has drawn criticism for so-called fuzzy distinctions among the different types of consumer value. For example, Solomon (1999) takes issue with the fact that the distinctions between status and esteem in the typology are unclear. He argues that, since esteem-related consumptions are carefully staged, esteem is active rather than reactive, as well as extrinsic and other-oriented. Richins (1999) acknowledges the difficulty of distinguishing between active and reactive sources of value in the cases of esteem and status. Also, Wagner (1999) argues that aesthetic and other forms of perception generally involve an active component of information processing. So, empirical

evidence suggests that the perception of beauty is an active process.

DEVELOPMENTS IN MEANS-END THEORY

Origins and Development of Means-End Theory

Means-end theory is related to expectancy-value theory, which suggests that in a choice situation individuals consider alternatives, weigh costs and benefits, and choose a course of action to obtain maximum utility (Landy and Becker 1987). Actions produce consequences from which individuals learn that particular product attributes cause particular consequences. People also learn to choose products that lead them to their desired consequences (Rosenberg 1956). Means-end theory explains the rationale behind why consequences are important by relating them to personal values (Botschen and Hemetsberger 1998).

The origins of means-end theory can be traced back to the 1930s, when Tolman pointed out the goal-oriented nature of human behavior (Herrmann and Huber 2000). The first versions of means-end chains appear in the research of Howard (1977), Cohen (1979), and Myers and Shocker(1980). Howard seeks to build on Rokeach's work by relating terminal and instrumental values to choice criteria. He suggests that the total meaning of a brand resides in a hierarchically organized set of consumers' categories based on their semantic properties, rather than consumers' evaluation of the categories. Choice, on the other hand, is an evaluation based on the terminal and instrumental values suggested by Rokeach.

This research focuses on the categorization of product classes.

Young and Feigin (1975) introduce “The Grey Benefit Chain” as an analysis method that links psychological benefits to product attributes. This method reveals associations between features or characteristics of products and benefits that consumers seek to obtain by using these products. Young and Feigin (1975) intended to help creative groups within advertising agencies to come up with better creative work using this method; however, it lacked a theoretical basis.

Gutman (1982) combines previous efforts of linking end-states, product attributes and consumers’ choice behavior in means-end theory. Means-end theory states that consumers use products or services as means to achieve certain goals or end-states (Gutman 1982; Reynolds and Gutman 1988). This theory relates product/service attributes to consumer behaviors associated with person-value structures that come from culture, society and its institutions, and personality. Products/services are linked to consumers’ selves in such a way that they carry special meanings beyond mere features. The main assumption of this theory is that structures of meaning linked to products/services and knowledge of behavior linked to consequences are stored in memory in a chain of hierarchically related elements (Botschen, Thelen, and Pieters 1999).

Product/service attributes are at the lowest level of the hierarchy. Consequences appear at the second level of the hierarchy, where they are linked

to the goals or end-states that constitute the highest level of hierarchy.

This theory, like Rokeach's definition of terminal values, defines values as desirable end-states of existence that play a dominant role in guiding choice patterns (Gutman 1982; Reynolds and Gutman 1988). Moreover, this theory assumes that people cope with the diversity of products/services around them by grouping them into classes or categories including product-class type (toothpaste, mouthwash, mints, chewing gums) and product functions (breath fresheners, teeth whiteners). This assumption leads to the notion that people use consequences as well as attributes to compare alternative choices that are incomparable (Johnson 1984).

Gutman (1991) identifies some major issues concerning the linkages in means-end theory. He explains that a means-end chain "presumes a number of attributes, consequences and values that are asymmetrically linked by the respondent whereby lower level elements lead to or imply higher level elements" (Gutman 1991, p144). The basic question that remains unanswered is in which direction the linkages should run. Means-end theory suggests that linkages lead from attributes (lowest level elements) to values (highest level elements). Olson and Reynolds (1983) suggest that, according to the levels of abstraction concept, an ordering among elements from attributes that produce consequences, and consequences that produce end-states is appropriate. However, this notion has not been tested yet.

Hypothesis 1: Attributes, consequences, and goals will comprise different factors.

Other key issues to discuss are the number of elements and linkages that should be represented in a chain, the strength of the linkages between various elements connecting product to the end-state level, the location of the linkages in the chain connecting attributes and consequences to end-states, the main focus of the respondent, and the relationship between end- states and choice behavior. To better understand these issues, each element, including all attributes, consequences, and end-states, requires special attention.

Attributes

Attributes are the characteristics of products or services designed by producers and service providers and sought by consumers that represent product/service knowledge(Claeys, Swinnen, and Vanden Abeele 1995). Botschen, Thelen, and Pieters note that attributes “do not explain per se for what reasons the product or service is or might be bought” (Botschen, Thelen, and Pieters 1999, p41). Nevertheless, most companies prefer to work with attributes in segmentation and new product/service design practices (Botschen, Thelen, and Pieters 1999; Urban and Hauser 1993).

Means-end theory considers product and service attributes in a continuum from concrete to abstract(Botschen and Hemetsberger 1998; Lin 2002; Olson and Reynolds 1983). Concrete attributes are relatively tangible

characteristics of products, such as dimensions, materials, packaging, flavor, and price. Zeithaml (1988) defines these qualities as intrinsic attributes that cannot be changed without altering the nature of the product/service itself. With services, concrete attributes such as location, layout, number of employees, and price are more limited. Abstract attributes are multidimensional and, therefore, more difficult to measure. Abstract attributes are also extrinsic, because they are related to, but not part of, the physical product/service. Branding, advertising, and style are examples of abstract attributes of products. Services, by nature, have more abstract attributes. Service quality can be considered as a higher level abstract attribute, because it is carefully designed, measured and controlled by the service providers. Indeed, in their influential research on service quality, Parasuraman, Zeithaml and Berry (1988) operationalize service quality in five areas:

- Tangibles: the physical facilities, equipment, appearance of personnel;
- Reliability: the ability to perform the desired service dependably, accurately and consistently;
- Responsiveness: the willingness to provide prompt service and help customers;
- Assurance: employees' knowledge, courtesy, and ability to convey trust and confidence; and

- Empathy: the provision of caring, individualized attention to customers.

They identify the differences between objective quality as measured by these five areas and perceived quality as gauged by customers' judgments about a service's overall superior performance. Clearly, perceived quality is based on consumers' consumption experiences; therefore, it is a consequence at a higher abstraction level than service attributes.

In other words, attributes are the things, people and activities that firms acquire and manage in order to fulfill a particular service requirement of a customer. Attributes are designed and managed by service providers to generate certain experiences for customers. Customers' perceptions about these experiences are not part of attributes, but constitute consequences.

Attributes are the lowest level element of the hierarchy that led to consequences. They contribute to goals or end states only to the extent that they create consequences for the customers. They do not have a direct effect on the degree of goal attainment. This leads to the second hypothesis:

Hypothesis 2: In a test of the structural relationships among attributes, consequences, goals and behavioral intentions, attributes will have a direct effect on consequences.

Consequences

Consequences are what customers accrue from the use of products to achieve personal goals. They are also referred to as benefits in the literature, because they reflect the perceived costs and positive outcomes associated with specific attributes (Baker, Thompson, and Engelken 2004; Gutman 1997). In this sense, for example, perceived service quality is a consequence whereas actual (designed) service quality is an attribute.

Olson and Reynolds (1983) discuss two types of consequences: functional and psychosocial, and they define functional consequences as direct, tangible outcomes of attributes. Psychosocial consequences are at a higher abstraction level than functional consequences, and they are intangible, personal and indirect. As a result, consequences are the outcomes of what customers experience with product or service attributes.

Claeys, Swinnen, and Vanden Abeele (1995) suggest that there is a sequence of links with self-knowledge and promoting desirable activities and avoiding undesirable ones. Customers may prefer some attributes more “because of their ability to deliver desired consequences or to avoid undesirable ones” (Woodruff and Gardial 1996, p69). Hence, it is logical to expect certain attributes to be related to certain consequences. What makes these certain consequences important? Research suggests that consumer behavior is goal-oriented (Bagozzi and Warshaw 1990; Huffman and Houston 1993; Pieters, Baumgartner, and Allen

1995). Customers approach or avoid certain consequences in order to achieve higher level goals or end states. Hence, consequences that are closely related to the focal goal will have precedence over other consequences.

The literature in means-end domain does not explicitly discuss the link between consequences and goals, or attributes and goals. The hierarchical nature of means-end theory dictates that consequences will lead to goals/end-states, rather than to attributes. This is supported by the fact that the level of abstraction increases from attributes to consequences and from consequences to goals. Stability of goals over time is also higher than stability of consequences and attributes respectively. In other words, the relationship between attributes and goals is mediated by perceptions of the consequences that these attributes have for customers. Thus, the relationship between consequences and goals should be stronger than the relationship between attributes and goals. These propositions lead to the next hypothesis:

Hypothesis 3: In a test of the structural relationships among attributes, consequences, goals and behavioral intentions, consequences will have a direct effect on goals.

Goals

Goal-oriented behavior of customers implies that information about product features and their associated experiences are organized in memory

around the goals that drive the experience (Huffman and Houston 1993). While people often have no prior knowledge about all of a product's features (attributes), they can focus on the goals they wish to attain via the selection of a product or a service and hence acquire goal-appropriate knowledge. The consequences of using a service will influence the degree of goal attainment for a customer. Consequences, on the other hand, often reflect what customers feel about the attributes after the consumption of a service. These feelings are expected to be positive or negative depending on the degree to which customers achieve to their goals.

Bagozzi and Dholakia (1999) stated that goals are what people try to accomplish. The intensity of a customer's feelings and behavior is related to the desirability of focal goal. Goals are not expected to change drastically in the short run. A person cannot attain her/his goals completely but can make incremental achievements throughout her/his life. At the end of every action that is directed towards a goal, an individual evaluates the outcome. Depending on the degree of attainment or failure, the individual makes behavioral intentions on how to act in the future (Bagozzi and Dholakia 1999). Woodruff and Gardial (1996) mentioned that desired end states (or consumption related goals) shape customers' decisions, especially intentions to buy and use products and services.

Individuals are influenced by the cultural values of the society from which they acquire their personal goals. Products/services have worth in terms of the

degree to which they contribute towards the attainment of individuals' desired goals or end-states. This notion is consistent with the relativistic and experiential nature of consumer value posited by Holbrook (1999).

The theory suggests that the level of goal attainment is a better predictor of future behavior than the quality of attributes or their related consequences (Gutman 1991; Olson and Reynolds 1983). Bagozzi and Dholakia (1999) theorize that individuals have intentions to perform goal-directed behaviors that are formed during the goal setting and goal pursuit stages of decision making. In these stages, an individual decides what goals he/she will pursue and why or to what degree he/she has achieved/ failed to achieve these goals. The evaluation of the salient consequences and their impact on goal achievement takes place during the planning, initiation and control stages that precede the goal pursuit stage.

Under this line of thinking, it is logical to expect that products or services that lead to comparatively higher levels of goal attainment would result in positive action by the customer (and vice versa). Since it is difficult to actually measure customer behavior, future behavioral intentions following the service consumption is expected to be an acceptable predictor of actual behavior. Furthermore, the higher the level of goal attainment, the more positive the behavioral intentions that predict positive actions in the future have become. This proposition leads to the fourth hypothesis.

Hypothesis 4: In a test of the structural relationships among attributes, consequences, goals and behavioral intentions, goals will have a direct effect on behavioral intentions.

Despite the increased popularity of investigating the goal-oriented behavior of consumers, there are only a few references in the literature regarding the types of goals that an individual may seek to achieve (Gutman 1997). The only exception, to the author's knowledge, is the research done by Pieters, Baumgartner, and Allen (1995) that identified long life, happiness, social acceptance and avoidance of costs as higher level goals for losing weight. Holbrook's typology may help classify these goals in the dimensions of self-oriented, reactive, other-oriented and extrinsic values, respectively. Gutman (1997) states that goal accomplishment is dependent on the actions of others as well as one's own actions. Social goals such as self-esteem may depend on being admired by others.

Further exploration of the topic of *types of goals* is warranted due to the lack of enough evidence to support any hypotheses other than a positive link between desired consequences and goals. Holbrook's consumer value typology dimensions will be instrumental in sampling from the goal domain for detailed investigation.

Moreover, the above mentioned review of the existing customer value

literature guided this researcher to define customer value as: *the value of a product or a service to a customer is the degree to which it contributes towards the attainment of the customer's desired end-states/goals*. This definition is a consolidation of the research in this subject and can easily be operationalized. It states that the object has value for individuals as long as it helps them to reach their goals that are usually defined by their cultural values. This definition also acknowledges the fact that an object that is superior in contributing towards the attainment of individuals' goals will have a competitive advantage among other objects.

This definition of the customer value is suitable to be measured within means-end hierarchy that explains which attributes of the object are closely related with its potential to deliver maximum goal attainment. As a result, researchers and managers can learn more about what type of value that object has for individuals. As theorized by Holbrook (1999), individuals may have multiple goals while consuming objects. Hence, objects may contribute to attainment of these various types of goals at varying degrees. From this perspective, quantifying the overall structure of the hierarchy for an object will help researchers to avoid oversimplification of the customer value concept.

METHODOLOGICAL ACHIEVEMENTS IN MEASURING MEANS-END HIERARCHIES

In this section, recent developments in methods of research in means-end theory are investigated. Although the primary method of investigation is qualitative in nature, some attempts to use quantitative methods in investigating means-end hierarchies exist in the literature.

Qualitative Methods

The first applications of means-end theory were introduced by advertising practitioners who tried to provide guidelines to creative groups on how to communicate with their audiences based on involvement and information processing (Young and Feigin 1975). Gutman (1982) extended this idea by placing it in a theoretical framework suggesting that consumers use a cognitive chain for buying decisions that relates product attributes to their consequences based on mainly the consumption experience as well as advertising and word-of-mouth communication. These consequences, in turn, contribute to the fulfillment of personal end-states. This study opened a new path for research in means-end theory.

The roots of this theory are embedded in the interpretivist paradigm. Hence, the initial approach to explore the means-end chains has been qualitative

in nature. Among the qualitative methods at researchers' disposal, laddering and grand touring are frequently used to identify means-end chains. The laddering method involves focused, one-on-one interviews. Typically, an in-depth interview starts with the identification of salient attributes of a product/service for the respondent. The researcher's objective in starting with salient attributes is to understand the ways in which the respondent sees the world and stores product information about the relevant actors, behaviors and situations (Huffman and Houston 1993; Reynolds and Gutman 1988).

"*Why*" probes are used to elicit desired consequences that arise from the use of important attributes. These probes help the respondents to explain why they want to experience specific consequences in specific use situations. *Why* probes become more and more abstract during the interview, moving the respondents to higher levels of abstraction until final end-states are reached. This kind of interview is based on the assumption that the representations of cognitive product/service meaning are stored in the memory in a chain of hierarchically related elements (Botschen, Thelen, and Pieters 1999).

Once the elaborate interview process has been completed, responses are content-analyzed by independent judges for all the elements from the ladders. Each element is classified into the three basic attribute, consequence and end-state levels followed by a further breakdown into individual summary codes (Reynolds and Gutman 1988). Next, the numbered master codes are arranged in

a matrix where rows represent a participant's ladder (multiple ladders result in multiple rows for one participant) and columns represent the sequential elements within the ladder. This matrix determines the dominant paths. This unique aspect of the laddering method makes it possible to move from qualitative to quantitative analysis techniques.

In order to construct the hierarchical map in the aggregate, another matrix (implications matrix) is formed from the first matrix (score matrix), and this implications matrix shows the number of times each element leads to each other element. In other words, the numbers in cells indicate the total of direct and indirect associations between concepts. Direct relationships among adjacent elements and indirect relationships among other elements represented in this square matrix identify dominant paths. To get rid of the noise created by insignificant linkages, judges use several different cutoff levels—usually from a minimum of 3 to 5 associations in a sample of approximately 50 participants. This allows researchers to focus on the most elaborate, frequent, and informative paths.

Reynolds and Gutman (1988) identified five types of relations:

“A-D Elements mapped as *adjacent* which have a high number of *direct* relations.

N-D Elements mapped as *nonadjacent* which have a high number of *direct* relations.

A-I *Adjacent* elements which have a high number of *indirect* relations but a low number of direct relations.

N-I *Nonadjacent* elements which have a low, non-zero number of direct relations but a high number of *indirect* relations.

N-O *Nonadjacent* elements which have a low (or zero) number of indirect relations.(Reynolds and Gutman 1988, p22)”

A-D and N-D relationships are frequently used to construct the hierarchical map. A-I and N-I relationships are carefully considered for the quality of the map and discarded if they do not meet the cutoff criteria. N-O relationships are automatically disregarded from the evaluation. The resulting map shows strong relationships among elements from the attribute level up to the end-state level and represents the sample’s perceptual orientations (Baker, Thompson, and Engelken 2004).

Gengler, Klenosky and Mulvey (1995) recommend using a graphical representation to improve communication of the hierarchical map concept. The centralized circle format reduces clutter and crossed lines and identifies the level of abstraction of the concepts through color coding. The researchers also recommend illustrating the relative number of subjects who mentioned a concept or made an association between concepts.

Attempts to Simplify the Qualitative Method

Other researchers have attempted to improve the prediction power of the laddering method by increasing sample size while reducing the complexity of data collection and coding. A modified paper-and-pencil version of the laddering technique is recommended for this purpose (Botschen and Hemetsberger 1998; Botschen, Thelen, and Pieters 1999; Walker and Olson 1991).

In the modified paper-and-pencil version, respondents are required to identify up to four of the attributions that they consider most important. Next, respondents provide up to three reasons why each attribute is important to them. A pre-printed matrix of four rows (for attributes) and four columns (for reasons) is provided for each respondent as a guide. Data collection is quantitative; however, data analysis follows the original qualitative laddering technique.

For example, Botschen and Hemetsberger (1998) investigated the degree of marketing program standardization of product, pricing and promotion decisions in three countries. The data for this study were collected from a large sample of approximately 1,100 respondents representing all three countries. At the analysis stage, 100 questionnaires per country were randomly drawn from the sample and were content-analyzed by two independent judges. Although this method addresses sampling issues, the richness of data is lost during random selection of responses. A general lack of control during the interviews

may preclude the detection of more than one consequence linked to a single attribute (Botschen and Hemetsberger 1998).

Botschen, Thelen, and Pieters (1999) have applied this method to benefit segmentation. They explain that little was known about the validity and reliability of this method before the above study. The compatibility of the results obtained from traditional laddering and paper-and-pencil laddering also needed to be addressed, since the latter method usually provides very little contextual information (Huber, Beckmann, and Herrmann 2004).

Quantitative Methods

Other researchers have tried to improve means-end chain analysis by incorporating statistical methods into the construction of hierarchical value maps, because the traditional stepwise procedure is cumbersome and relies on many trials-and-error (Valette-Florence and Rapacchi 1991). One proposed method relies on graph theory and an algorithm which is the transposition of the Dijkstra method to solve the longest path problem (for details of the method see Valette-Florence and Rapacchi 1991). This algorithm identifies all the possible nodes from attributes to consequences and then focuses on the most relevant linkages for a given research question based on their maximum weights.

In order to identify the dominant paths, researchers may use multiple-correspondence analysis to develop a spatial representation of qualitative profiles in a reduced Euclidean space. The next step is to utilize cluster analysis

“on the spatial coordinates analogous to the tandem use of factor analysis and clustering in the case of quantitative variables (Valette-Florence and Rapacchi 1991, p37).” This method is complex and quantitative. The authors do not discuss how the data were collected. However, the data that they used for demonstrating the techniques seem to have come from the qualitative study conducted by Reynolds and Gutman (1988).

Another method of utilizing a variation of multiple-correspondence analysis involves nonlinear generalized canonical analysis (Valette-Florence 1998). This method also runs a quantitative analysis on a data set collected through the traditional laddering technique. Before analyzing data with this method, the data were separated in three pre-defined sets that represent attributes, consequences and end-states. While traditional multiple-correspondence analyses try to find the overall representation of elements—such as attribute₁ and consequence₄, consequence₂ and end-state₁—that explains the total inertia, this method tries to explain all the interactions among original variables. It allows researchers to perform cluster analysis on the attributes, consequences and end-states and discriminant analysis among the resulting clusters. However, this method is exploratory in nature. As Valette-Florence (1998) mentions, the nonlinear generalized canonical analysis method has not previously been used in marketing research.

Herrmann and Huber (2000) explain multiple-correspondence analysis as

a way to reconstruct a two- dimensional space. They construct a contingency table in which the cell connecting a row and a column variable contains a non-negative integer if that particular combination appears in the ladder of a respondent. Through this method, one can identify clusters of respondents assigning different levels of importance to some attributes, consequences and end-states than others. So, it is possible to infer the existence of an association between the sets of end-states and the market segments. However, this method does not attempt to show relationships among elements of the hierarchical chain within an identified segment.

Regression was used to demonstrate the associations between means-end levels of knowledge in terms of the attributes, consequences and end-states that contribute to the explanation of brand persuasion (Reynolds, Gengler, and Howard 1995). This research provides some quantitative empirical evidence of the link from product/service attributes to consequences; and from consequences to end-states. Furthermore, it provides evidence for the effectiveness of means-end chain elements in influencing brand persuasion. While the relationship between brand persuasion and different elements of the means-end chain is investigated through a series of regressions, the means-end chain is formed through the traditional laddering technique.

Multidimensional scaling has also been used to identify means-end hierarchy elements (Aurifeille and Valette-Florence 1995). This method produces

a metric configuration from measures of similarity/dissimilarity between items. The researchers maintain that this method is superior to multiple-correspondence analysis, because it is more versatile in handling a large range of association coefficients that come from the means-end chains and more robust in the event of incomplete data.

In order to illustrate the method, Aurifeille and Valette-Florence (1995) used a wine-cooler data set collected through qualitative laddering interviews and previously used by Reynolds and Gutman (1988). In this method, judges coded each element as either attribute, consequence or end-state and then constructed the implication matrix. The researchers summarize their methodology as indicated in Table 2-2.

The question of the appropriateness of the three-stage ($\sigma=3$) or six-stage ($\sigma=6$) model warrants further investigation. This method also removes the associations that exist between the items of the same hierarchical level, based on the presumption that they will function as rivals.

In Table 2-3, a categorization of means-end research in terms of data gathering and analysis techniques can be found. This table is not exhaustive, but helps to identify gaps in the research.

Table 2-2 Multidimensional Scaling

Step	Descriptions of the Step
Hypergeometric Probability	"Across respondents, calculate the hypergeometric probability of a link between pairs of laddering items."
Nonmetric Multi-Dimensional Scaling (MDS)	"Perform nonmetric MDS on the resulting matrix of probabilities."
Chains	"Generate a list of potential chains."
Semantic Distance	"Calculate the semantic difference between these chains and the ladders, using item coordinates from the semantic MDS space."
Ladders	"Assign the ladders to a fixed number, σ , of potential chains, so that the semantic distances between these chains and their assigned ladders are minimized."
Dominant Chains	"Determine the dominant chains by testing successive values of σ until an optimum is found in function of the dominant chains' number and of the corresponding fusion index."

Source: (Aurifeille and Valette-Florence 1995, p.272)

Table 2-3 Data gathering and Analysis Techniques for Means-End Hierarchies

		<i>Data Gathering Technique</i>	
		<i>Qualitative</i>	<i>Quantitative</i>
<i>Data Analysis Technique</i>	<i>Qualitative</i>	(Young and Feigin 1975) (Gutman 1982) (Reynolds and Gutman 1988) (Huffman and Houston 1993) (Baker, Thompson, and Engelken 2004)	<i>Modified paper and pencil:</i> (Botschen and Hemetsberger 1998) (Botschen, Thelen, and Pieters 1999) (Walker and Olson 1991) (Pieters, Baumgartner, and Allen 1995) (Bagozzi and Dabholkar 1994) (Bagozzi and Dabholkar 2000)
	<i>Quantitative</i>	(Valette-Florence and Rapacchi 1991) (Valette-Florence 1998) (Herrmann and Huber 2000) (Reynolds, Gengler, and Howard 1995) (Aurifeille and Valette-Florence 1995)	(ter Hofstede, Audenaert, Steenkamp, and Wedel 1998) <i>(They started with a pre-specified list of attributes and build consequences and end states with traditional laddering; analyzed data quantitatively.)</i>

Methodological Problems

Laddering is the primary qualitative data gathering method used in the quantitative methods applied to means-end research. Sometimes it is referred to as “soft laddering”, where respondents are allowed the freedom to discuss their own means-end elements. At other times, researchers use “hard laddering” (or a paper and pencil version), where respondents are asked to follow one ladder at a time. This method has more structure and results in shorter ladders. Whichever laddering method is used, some methodological issues result from trying to increase the sample size in order to quantify the results.

The formation of the implication matrix that represents the number of direct and indirect relationships among attributes, consequences and end- states that emerge from the content-analyzed data is a cross-over to quantitative applications (Reynolds and Gutman 1988). As the sample size increases, the laddering process becomes cumbersome for both respondent and interviewer, and the potential for bias introduced by the interviewers, judges, and the coding system itself increases (Grunert and Grunert 1995; Huber, Beckmann, and Herrmann 2004). As a result, laddering is not intended to be used as an instrument in large representative samples (ter Hofstede, Audenaert, Steenkamp, and Wedel 1998).

The implication matrix is actually the correlation matrix among the various elements of the means-end chain. In order to focus on the significant

correlations, small correlations are usually removed from the matrix based on an arbitrary cut-off level. However, the appropriateness of this approach is questionable, considering the small samples of 50-60 respondents (Aurifeille and Valette-Florence 1995; Grunert and Grunert 1995).

There are also issues associated with quantitative analysis methods that are applied to the data collected through laddering technique. For example, the means-end chain results obtained by cluster analysis are usually difficult to interpret. In many clusters that are performed on respondent data, some basic means-end levels are missing. Other clusters, on the other hand, may have too many items represented. There is also a lack of information on the number of ladders represented by each cluster (Aurifeille and Valette-Florence 1995).

Bagozzi and Dabholkar (Bagozzi and Dabholkar 2000) point out that means-end theory is grounded in cognitivism, which presumes that internal mental processes are accessible and that self-knowledge is possible albeit incomplete. They call attention to the problem of testing construct validity, which requires the application of multiple methods for each measurement of each concept, and find the traditional laddering technique to be ill-suited for investigating intangible entities such as services, ideas, or persons.

The above research indicates a need to integrate idiographic procedures with nomothetic procedures (Bagozzi and Dabholkar 2000). Idiographic procedures are good for in-depth probing to reveal cognitive representations,

whereas nomothetic methods based on representative samples are generalizable over populations. Means-end theory claims that researchers can access individual mental processes through the laddering technique. The research stream in this domain seems to be moving towards incorporating nomothetic methods into the analysis.

The above mentioned research activities indicate that there is a search for better quantitative methodological tools in measuring means-end hierarchies for products and services. All these attempts presume that the links starting with attributes and ending with goals are given, and customer responses in a laddering interview can be classified into one of the three distinctive categories, namely attributes, consequences or goals. The classification usually is done by judges and the resulting matrices are analyzed using various statistical programs.

In this dissertation, items for attributes, consequences and goals will be derived from the normal process of item generation as suggested in Dillman (2000). Then, consumers of an educational service will be consulted on how they evaluate the attributes of this service, the consequences of consuming the service for them, and the degree to which this service helps them to attain their goals. The resulting data will then be analyzed to determine if the relevant items are distinct and causally linked as hypothesized above. This approach will help researchers to avoid bias introduced by the data collection and the classification

process of traditional laddering method.

CHAPTER SUMMARY

This chapter summarizes the existing body of knowledge in customer value and means-end theory. The customer value concept is defined in multiple ways—including cultural values, trade-offs, process, and experience. The similarities and differences among these definitions are investigated and an operational definition of customer value is offered.

Means-end theory states that product knowledge can be related to self-knowledge. According to this theory, customer value is identified as the highest end-state. Therefore, it is important to understand the concept of customer value thoroughly.

The development of means-end theory is the next area of inquiry, revealing that even though researchers frequently use this theory and the laddering technique, means-end theory has not been tested yet as a comprehensive quantitative model. Hypotheses about the relationships among attributes, consequences, end-states (goals), and behavioral intentions were formulated on the basis of this inquiry.

Finally, recent methodological developments in measuring means-end hierarchies were discussed in the last section. This discussion included a review

of the strengths and limitations of qualitative and quantitative methods. The literature review revealed that researchers have been looking for appropriate quantitative methods to identify and analyze means-end hierarchies. Multiple methods including multiple-correspondence analysis, nonlinear generalized canonical analysis, regression, and multidimensional scaling were suggested for analyses. However, all these methods were applied to data collected through qualitative techniques (soft or hard laddering), which inherently contains limitations of these techniques. In the third chapter, the details regarding the methods to test the preceding hypotheses will be discussed, including the research context, methodology of data collection and analysis.

CHAPTER 3 : RESEARCH METHODOLOGY

INTRODUCTION

The purpose of this chapter is to describe the methodology for collecting and analyzing data relative to the quantitative application of the means-end hierarchy in an educational service situation. A survey questionnaire was employed to gather the desired information. A pre-test was done to evaluate the measurement instrument.

The survey method is cost effective for collecting large amounts of highly structured data for theory testing. Samples are drawn from a population. Survey is an efficient method for gathering information about the defined population. Results may be generalizable to and across the populations of persons, settings, and time (Cook and Campbell 1979).

The robustness of the data collection method, instrument and hypotheses were tested utilizing two groups of respondents. The structural equation modeling (SEM) method was used to test the means-end theory. Importance analysis (Johnson 2000) and Dominance analysis (Budescu 1993) were used to explore the relationships among salient attributes, consequences, and end states/goals. Details and theoretical background information about these methods will be covered in Chapter 4.

RESEARCH QUESTIONS AND HYPOTHESES

As stated in Chapter 1, the primary purpose of this dissertation is to quantitatively apply the means-end hierarchy in the evaluation of an educational service. This application also provides a test of means-end theory in a specific use situation. Therefore, this study examines the relationships among attributes of an educational service, the consequences of these attributes as experienced by customers, goals that customers want to achieve, and finally, the behavioral intentions of customers after they have experienced the service.

Research Hypotheses

An understanding of the means-end theory suggests four hypotheses regarding the relationships among the key constructs of the theory. Discussions about the development of hypotheses are in Chapter Two. The hypotheses are restated below:

Hypothesis 1: Attributes, consequences, and goals will comprise different factors.

Hypothesis 2: In a test of the structural relationships among attributes, consequences, goals and behavioral intentions, attributes will have direct effect on consequences.

Hypothesis 3: In a test of the structural relationships among attributes, consequences, goals and behavioral intentions, consequences will have direct effect on goals.

Hypothesis 4: In a test of the structural relationships among attributes, consequences, goals and behavioral intentions, goals will have direct effect on behavioral intentions.

Exploratory research question: An important objective of this study is to test the robustness of the means-end hierarchy theory and data collection method across samples. In each case, the researcher can reasonably expect to find differences in saliency of attributes, consequences and potentially goals across the samples. However, prior research is insufficient to help formulate specific hypotheses. Therefore, the following research proposition is put forth:

Proposition 1: The hierarchical map for users of simulation (as an educational service) with limited business experience (undergraduate students) will be different from the hierarchical map of users with considerable business experience (executives).

One of the main differences between an undergraduate student sample and a business executive sample is that the latter group has considerably more business experience than the first group. The proposition above assumes that it is

possible to determine the impact of business experience on the evaluation of educational service attributes, consequences, and goals that each group tries to achieve. Such differences may be due to several experience related factors.

First, thanks to their hands-on experience, business executives will be able to better understand and relate to the pros and cons that their coaches/instructors want them to investigate and elaborate in decision making periods of the simulation than the undergraduates. Eventually, this may lead to a higher level of appreciation of the work done by their coaches/instructors among business executives. Undergraduates may also have more difficulty in recognizing and evaluating characteristics of good coaches compared to business executives.

Second, business executives may be better able to evaluate the reality of situations presented in the simulation than undergraduates. The lack of business experience may be again the hindering factor for undergraduates to really understand and evaluate business situations and take appropriate actions on time.

Third, business executives may have clearer and more specific goals in terms of having higher level education. This is because most of them usually keep on carrying the full responsibility of their jobs, while they are completing the requirements of higher education. Undergraduates may be more ambiguous in terms of their simulation-specific goals (passing the course, having an A as a

grade, being able to graduate), while business executives are expected to be clearer about what consequences they want to experience and what consequences they want to avoid in order to reaching their goals. They are expected to have a better understanding of the degree to which the simulation helps them to achieve these goals.

Finally, business experience may enable executives to establish more competitive and aggressive plans to achieve their goals in the simulation. The variance introduced by the more competitive activity in their games should enrich their experiences; hence it will provide more enjoyment at the end of the game compared to undergraduates' level of enjoyment. This discussion leads to the following corollary.

Corollary: The differences in the hierarchical structure observed between the two groups should be consistent with their different levels of experience and stage in their career.

RESEARCH DESIGN

Research Context

An educational service was chosen as the research context. Education is intangible, heterogeneous, perishable if not consumed, and production and consumption usually occurs simultaneously (Lovelock and Wirtz 2004).

Furthermore, the control of the variability and quality of service are major issues in education. Lovelock and Wirtz (2004) classified education as a mental stimulus processing service in which intangible actions are directed to peoples' minds. In this service category, customers are mentally dependent on the service provider. Hence, careful monitoring and strong ethical standards must be an important part of this service.

Recently, there has been a gradual shift from the emphasis on traditional lecture-based classroom instruction to interactive classrooms where instructors use computer-based learning packages, hypermedia technology, and Internet applications to help students become actively engaged in the learning process (Ueltschy 2001). Computer-based business simulations are one of the major interactive tools quickly penetrating business schools to enhance the experiential learning process.

Simulations have been used as a learning tool for more than 30 years (Greenlaw and Wyman 1973; Keys 1976). They played a relatively minor role in business teaching until recently. The earliest generations of simulations were cumbersome to use and required considerable instructor time and support. The models were fairly simple, hence were not very exciting for students and did not provide real-life business decision-making opportunities. These are the major factors that have hindered the diffusion of simulations in collegiate classrooms.

Thanks to the increased computing power of computers that allow developments of sophisticated algorithms, a new generation of simulations can offer more realistic decision environments. Also, the availability of the web has made simulations much easier to administer and use. These developments have lightened the burden of using full-enterprise business simulations for instructors (Affisco 2000).

Computer-based business simulations are usually new to the students. Furthermore, most students have had no prior experience with a full-enterprise business simulation such as the one to be used in this study. At most, they have encountered limited or narrow applications within a business function. Thus, simulations can be considered as a new educational service for them.

The recent paradigm shift from “instruction” to “learning” has encouraged instructors to incorporate experiential learning exercises into their course design (Leeds, Stull, and Westbrook 1998; Michlitsch and Sidle 2002). Business simulations are among various methods such as case study, small group assignments, and projects that enhance experiential learning. This paradigm shift has also promoted research about the effectiveness of different experiential learning methods.

Researchers have examined whether there is value for students in a business simulation game (Faria and Whitely 1990; Keys 1976; Walters and Rashed 1997). Keys and Wolfe (1990) identified about 60 studies that showed

problematic educational efficacy of business simulations. During these early studies, while students appeared to learn the importance of focusing on strategy and a long-term perspective, their performances on final exams were not related to their performances in a simulation (Gopinath and Sawyer 1999). Recently, Mitchell (2004) found that adding a computer-based simulation to a strategic management course centered on case discussions did not significantly improve learning outcomes.

Nevertheless, there are studies that promote benefits of simulations. It is believed that simulations help students to develop interpersonal skills, oral presentation skills, internalize concepts and develop customized learning (Cadotte 1995; Harrison-Walker 2000; Stonham 1995). They can offer students responsibility for their decisions, as well as authority in their recommendations (Cadotte 1995). They promote highly complex, interdependent decision making. Moreover, they reflect a real-life manager's role because the decisions need to be implemented in a time-pressured environment. Once each period is played, students need to evaluate the consequences of their decisions and fine-tune their strategies and tactics according to their consumers' and competitors' responses. This enables them to apply their knowledge and improve critical thinking skills better than traditional instructional tools (Chapman and Sorge 1999). Vaidyanathan and Rochford (1998) found that simulation performance correlates with exam performance, especially among students with high preference for

learning by reading. Walters and Rashed (1997) found that simulations are effective tools for exploring strategic alternatives and their consequences in business policy courses. They recommended comparing and contrasting business simulations with other integrative methods and pedagogies. Such comparisons should illuminate the pros and cons of various educational pedagogies.

The means-end hierarchy as a measure of service value will be evaluated in the educational market which is a pure service market. In addition, simulations will be the primary focus of the study, because they represent a relatively recent pedagogy where students have little experience. The historical research indicates the presence of debate about the value of simulations, yet the numbers and variety of simulations keep growing. So, there must be something more to simulations than has been revealed in prior research. The application of means-end theory might shed some light on the worth of this pedagogy.

SAMPLE STRUCTURE

As the respondents needed to experience the service before they evaluate the value of the service, a random sampling approach could not be used. In this case, cluster sampling was more appropriate (Frankel 1983). Respondents were invited to give feedback about their experiences after they complete the simulation.

Table 3-1 Sample Structure

<i>Sample Size</i>	<i>Students</i>	<i>Executives</i>
<i>Pretest</i>	379 participants	
<i>Main study</i>	599 participants	191 participants

A pretest was done in order to test and refine items for the actual study. The number of participants in both the pretest and main study can be found in Table 3-1.

This dissertation research was designed to compare and contrast means-end hierarchies of two different groups of respondents, namely undergraduate students and executives. The focus of this study was on the educational market.

Consequently, the target population included undergraduate and executive students enrolled in for-credit programs. It was reasonable to expect that applying the method to different samples with different needs should yield results that are reflective of these differences. Clearly, the learning goals of these two groups should be different and thus the evaluation was expected to be different.

The first group (undergraduate students studying business at a major university in the Southeast of the United States) were exposed to a

comprehensive full-enterprise simulation during their junior or senior year in college. Prior to their participation, all students had received training in the business fundamentals of marketing, finance, accounting, operations, statistics, economics, distribution and human resources. Within this context, the simulation was designed to integrate the material from these foundation courses and provide a platform for additional courses in the student's major and collateral areas.

Respondents of the second group (executives) were enrolled in one of three Executive MBA programs located at three major universities located in the Southeast, Mid-Atlantic, and Midwest states. In two cases, the EMBA (Executive Masters of Business Administration) students were participating in the simulation as a capstone experience in their EMBA program. In one case, the simulation occurred at the start of the second year and was designed to reinforce and integrate the materials delivered during the first year, laying the foundation for the second year (similar to the undergraduates). Although it would be desirable to have all participants from the same university and EMBA program, the number of students in each program is insufficient to allow rigorous testing of the theoretical structure.

Both the undergraduate students and the executives were enrolled in a course designed to integrate the disciplinary content of all the functions of business. A full-enterprise simulation was employed as the main experiential

learning tool for the course. It was accompanied by a series of lectures that are designed to lay the theoretical and managerial foundations for the decisions to be made during the exercise.

There was one important difference between the two courses offered to undergraduates and executives. That was, the undergraduate students worked on the simulation in a 15-week course. The executives, on the other hand, worked on the simulation within a five-day intensive seminar. Thus, the undergraduate students had more time to process the learning material and business decisions to be made than the executives. On the other hand, the executives had much more experience with making business decisions and interpreting relevant information and managerial practices. Thus, they were not likely to need as much time.

SURVEY DESIGN

In this dissertation research, Dillman's (2000) survey design approach had been followed in the development of the survey instrument. The details of the scale development procedure are described here, followed by the justification of the construction of the measurement instrument. Next, the procedure for implementing the survey will be discussed. Finally, the steps taken to reduce sampling errors will be covered.

Scale Development

The attempt to quantitatively measure the elements and relationships within the means-end theory creates a unique situation where there are no previously-developed measurement scales upon which to draw. Therefore, it was necessary to develop new scales for the attributes, consequences and desired end states related to this educational service. Three sources were employed to identify relevant content, one for each stage in the hierarchy.

The first source tapped the experiences and objectives of the team that developed the simulation. This group helped to enumerate the attributes and features of the simulation which were purposely created to improve the learning environment.

The second source explored the learning objectives of the instructors who taught the courses. These learning objectives were very similar to the consequences that a student might realize by participating in the simulation. Thus, the learning objectives were used to develop items for the consequences section of the questionnaire.

The last source was the theoretical literature on value types. This literature was useful in enumerating possible end-states or goals that a student might achieve after participating in a comprehensive learning experience. Holbrook's work on value types (1999) was especially instrumental in the development of a

comprehensive set of goal items. He provided a typology of the many types of goals that a person could pursue in a consumption experience. By developing scale items that corresponded to this comprehensive set of end-states, it allowed a systematic sampling from the domain of value types as defined by Holbrook (1999).

In addition to these elements of the means-end hierarchy, it was also desired to develop items that measured the behavioral intentions of the participants given their evaluation of the learning experience. These behavioral intentions were combined into a criterion variable with which to test the other aspects of the theory. The intention scale was developed based on experiences of instructors and informal discussions with students. These scales were evaluated in a pre-test survey for the computer-based simulation.

Churchill's (1979) five-step process was used to create new items. The first step was item generation. A pool of items was generated for each construct in various forms, including Likert and rating-type scales. Then, as the second step, academic colleagues familiar with the phenomenon reviewed the items in terms of specificity, readability, face validity, and content validity.

Specificity is defined as the minimum ambiguity. Are the items asking more than one thing or do they have a one-on-one correspondence with the dimension measured? Once specificity is established, readability is the second

criteria. The items were evaluated in terms of language and grammatical construction, as well as ease of response.

Face validity is another criterion that represents the consistency of items with the theoretical domain of construct. Content validity is the last criteria, which is defined as the extent to which the items are representative of the constructs they are intended to measure.

The Construction of the Measurement Instrument

According to Churchill's (1979) measurement design guidelines, the third step in the process is a review of items in terms of their categorization in the proper constructs. In this case, the items should fall within attribute, consequence, goal and behavioral intentions categories. The placement order of items in the survey is also very important because it affects the mindset which is created on the part of the respondent.

In order to evaluate whether or not the items could be properly categorized, three judges were recruited to review the items and the questionnaire. These judges were selected because they are familiar with the means-end hierarchy theory and have some familiarity with the pedagogical approach under evaluation.

The questionnaire is composed of 78 items of 5-point Likert and rating-type scales. These items were developed and assembled as attributes, consequences, goals, and intentions by two researchers. Groups of items were

physically placed in the survey in the order of 1) attributes, 2) consequences, 3) goals and 4) future intentions. This schema was selected because it follows the laddering idea of how the constructs relate one to the other. Also the order of items is important as service meaning structures are stored in memory that consists of a chain of hierarchically related elements (Botschen, Thelen, and Pieters 1999).

Within the content area of goals, Holbrook's typology was employed to organize the creation and selection of items. This approach acknowledges the current debate in value typology (Richins 1999; Solomon 1999), and covers the domain of "the dimensions of values" as much as possible. It also let the data reveal the dominant paths, rather than incorporate pre-imposed type of goals. Redundancy was purposefully introduced to tap each dimension of customer value and cover the whole domain of the value hierarchy; it also prevented block-outs. (Churchill 1979).

The three judges carefully reviewed the items and their relationship to the constructs selected for the study. They also reviewed the placement of the items and constructs within the questionnaire. They found that the nature and placement of the items was satisfactory.

The items selected for attributes, consequences, goals and behavioral intentions for the pre-test study can be found in Attachment A respectively.

Survey Implementation

A sample of 379 students was exposed to the survey as a pretest. The goal was to identify potential problems related to survey completion, response rates, language, data quality, unidimensionality, and scale reliability. Confirmatory factor analysis and reliability tests were conducted on pretest results in order to purify scales further.

The main study was conducted with two target samples, including undergraduate students that were enrolled in a junior level integrated business administration course and executives that were enrolled in either an Executive MBA program or an Executive Development Program.

The sampling strategy was to invite the participants to complete the survey at the end of semester or development program. The simulation-oriented survey was administered online with an email invitation to participate in the study. Multiple follow-up reminders were used over a four-week period to encourage participation in the study.

An invitation (introduction letter) containing a link to the survey site was sent to the students' and executives' e-mail addresses at the end of simulation. Once they read the consent form, they could proceed to the next step and responded to questions in the survey. The web survey was designed in such a way that respondents could not enter more than one answer to each close-ended

question. At the end of each page respondents were automatically warned if they omitted an answer. Respondents had the freedom to quit the survey at any time.

Unfinished responses were examined for non-response bias later.

Completed responses were stored in a spreadsheet file and participants were assigned a respondent number to assure anonymity before any analysis was conducted. Pre-codes provided tracking of open and close-ended questions.

Approaches to Reduce Sampling Errors

Threats to internal validity included potential incidents of non-response and false-reporting bias. One way to deal with non-response bias was to contact non-respondents and ask a few questions from the survey. These responses could be compared to the averages of the total sample (Mentzer and Flint 1997). Another way to test non-response bias was to examine differences between waves of surveys (Armstrong and Overton 1977). However, with an 85.9 percent response rate on a pre-test non-response bias was not an issue. This method was be used for the main study.

Another threat to internal validity was false-reporting bias. However, there was no efficient method to examine response accuracy. Voluntary participation and assurance of complete anonymity were instrumental in motivating respondents to communicate their sincere thoughts and feelings. These conditions should minimize the potential for false-reporting.

PRE-TEST DESIGN

A web-based survey was used to collect pretest data in the simulation-based environment. No reward was promised during the pretest data collection period. Still the pretest response rate was 85.9 percent. This high response rate was probably due to the students' high involvement and their desire to express themselves about the experience. The pre-test survey is in Appendix A.

Pre-Test Data Analysis

SPSS 14.0, AMOS 6.0, and NCSS packages were used for the pretest data analysis. Specifically, the types of analyses included descriptive statistics, item normality tests, confirmatory factor analysis, and item reliability analysis. Missing data analysis checked the averages of available participants' responses with missing data and compared them with the overall sample. No differences were found. Since the response rate was acceptable and the sample size was large, surveys with missing data were completely eliminated from the data.

AMOS 6.0 provides tools to diagnose problematic items. Modification indices capture evidence of misfit that show the extent to which the hypothesized model is appropriately described (Byrne 2001). The analysis of these indices for the pre-test data showed a very complex relationship among items that loaded to each latent variable, as well as redundancy that was introduced on purpose. The covariances among items of the same latent variable

may derive from the characteristics of specific items, they were allowed to correlate (Aish and Joreskog 1990).

Modification indices for item Q63 showed cross loading to attributes and goals. As a result, it was removed from the model. Items Q14 and Q36 were similar, and as Q14 did not load to attributes, it was removed. Item Q36 was retained.

Unidimensionality of latent variable items, reliability and construct validity are discussed next.

Unidimensionality

Unidimensionality is demonstrated through the overall goodness of fit of the model in confirmatory factor analysis, where items converge on the latent variables that they are supposed to measure. As suggested by Anderson and Gerbing (1982), confirmatory factor analysis was conducted on four latent variable model (Figure 3-1). The fit of the model was good. The root mean square error of approximation (RMSEA) was 0.052; comparative fit index (CFI) was 0.912 and chi-square per degrees of freedom (Chi-square ratio=CMIN) was 2.005.

In order to further check unidimensionality, factor analysis with Varimax rotation had been done on attributes, consequences, and goal items (Table 3-2). Results indicated the presence of lower level goals or higher level consequences. These group of items that can be either lower level goals or higher level consequences were named as Skill Development items, including Q35, Q36, Q37,

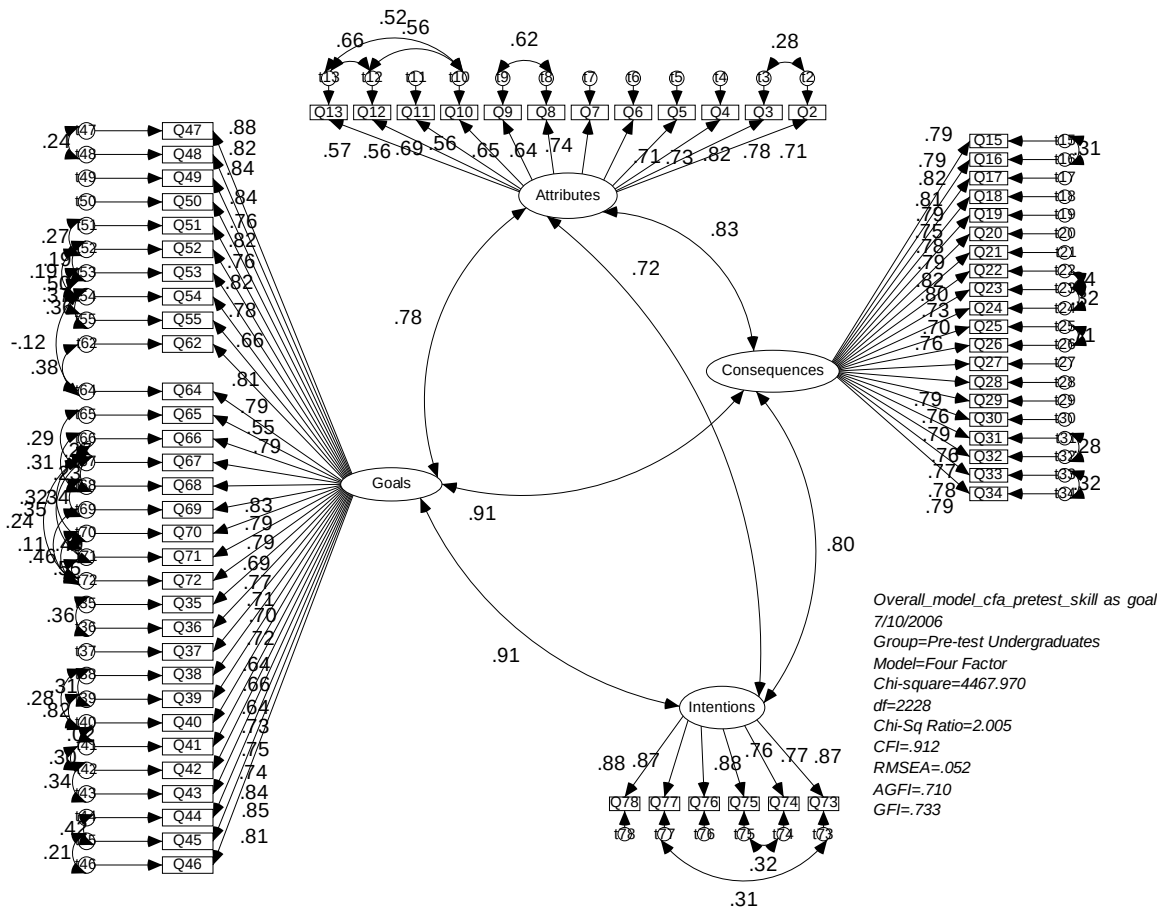


Figure 3-1 Pre-test Data - Analysis of Unidimensionality

Table 3-2 Factor Loadings of Pre-Test Items with Varimax Rotation

		Factors*		
		1	2	3
	Description	Consequences	Goals	Attributes
q2	Attribute			.481
q3	Attribute	.489		.535
q4	Attribute	.529		.567
q5	Attribute			.514
q6	Attribute			.594
q7	Attribute			.573
q8	Attribute			.609
q9	Attribute			.574
q10	Goal			.778
q11	Goal			.607
q12	Attribute			.787
q13	Attribute			.727
q14	Goal	.703		
q15	Consequence	.635		
q16	Consequence	.672		
q17	Consequence	.688		
q18	Consequence	.615		
q19	Consequence	.625		
q20	Consequence	.499		
q21	Consequence	.673		
q22	Consequence	.658		
q23	Consequence	.729		
q24	Consequence	.707		
q25	Consequence	.523		
q26	Consequence	.509		
q27	Consequence	.682		
q28	Consequence	.691		
q29	Consequence	.625		
q30	Consequence	.712		
q31	Consequence	.626		
q32	Consequence	.664		
q33	Consequence	.630		
q34	Consequence	.634		
q35	Goal	.560		
q36	Goal	.693		
q37	Goal	.545		

* Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 8 iterations.

Table 3.2 Continued

		Factors*		
	Description	1 Consequences	2 Goals	3 Attributes
q38	Goal		.539	
q39	Goal		.643	
q40	Goal		.640	
q41	Goal	.570		
q42	Goal	.571		
q43	Goal	.550	.496	
q44	Goal	.621	.494	
q45	Goal	.578	.559	
q46	Goal	.472	.610	
q47	Goal	.579	.594	
q48	Goal	.587	.522	
q49	Goal	.601	.530	
q50	Goal	.573	.574	
q51	Goal	.541	.530	
q52	Goal	.521	.647	
q53	Goal		.653	
q54	Goal	.546	.648	
q55	Goal		.648	
q62	Goal		.476	
q63	Goal			.577
q64	Goal		.606	
q65	Goal		.635	
q66	Goal		.574	
q67	Goal		.788	
q68	Goal		.719	
q69	Goal		.722	
q70	Goal		.772	
q71	Goal		.743	
q72	Goal		.796	

Q38, Q39, Q40, Q41, Q42, Q43, Q44, Q45, and Q46.

The literature on means-end hierarchy includes discussions of the probable presence of higher level consequences and lower level goals (Olson and Reynolds 1983; Reynolds and Gutman 1988). However, there is no clear guidance on how to identify them. The above mentioned items may be lower level goals or higher level consequences for this specific sample or simply bad items. It is necessary to test these items in different samples. As a result, Skill Development items (Skills) was further analyzed using structural equation modeling in the main study.

Confirmatory factor analysis was repeated for the five construct model and significant improvements in the model fit were obtained. (Table 3-3 and Figure 3-2) Thus, skill development was investigated as a separate construct from goals and consequences in the main study.

Apparently, the methods used to manage product quality are not fully applicable to the development of services quality (Parasuraman, Zeithaml, and Berry 1985; Rust and Oliver 1994). According to Johnson et al. (2000), this phenomenon is due to the fact that services have unique characteristics, including intangibility, inseparability, heterogeneity, and perishability (Zeithaml, Parasuraman, and Berry 1985). *Intangibility of services* means that services cannot be stored, protected through patents, displayed, or communicated readily

Reliability

Reliability of measures was examined in two ways. The first was coefficient of alpha where 0.70 was selected as the minimum level acceptable. The second way to examine reliability is to examine the variance extracted for each constructs; it must be greater than 0.50. The results of reliability analysis for the pre-test data can be found in Table 3-4.

Coefficients of alphas for all constructs were greater than 0.90, showing a good reliability of constructs as well as redundancy introduced on purpose.

Variance explained by each construct was greater than 50 percent. However, the attributes construct had more than one factor. Moreover, confirmatory factor analysis done for unidimensionality and construct validity (which will be

Table 3-3 Pre-Test Data - Model Comparisons

<i>Model</i>	<i>Chi-Sq</i>	<i>d.f.</i>	<i>Change in Chi- Sq. (*)</i>	<i>CMIN Ratio</i>	<i>CFI</i>	<i>RMSEA</i>	<i>AGFI</i>	<i>GFI</i>
<i>One Factor</i>	5599.15	2234	1337.49	2.551	0.863	0.064	0.600	0.630
<i>Four Factors- Skills as Consequences</i>	4616.48	2228	254.81	2.072	0.906	0.053	0.699	0.722
<i>Four Factors- Skills as Goals</i>	4467.97	2228	106.30	2.005	0.912	0.052	0.710	0.733
<i>Five Factors-Skills as a separate construct</i>	4361.67	2224	-	1.961	0.916	0.050	0.716	0.739
(*) Assuming five factor model to be correct, all changes in chi-square are significant at p=0.000								

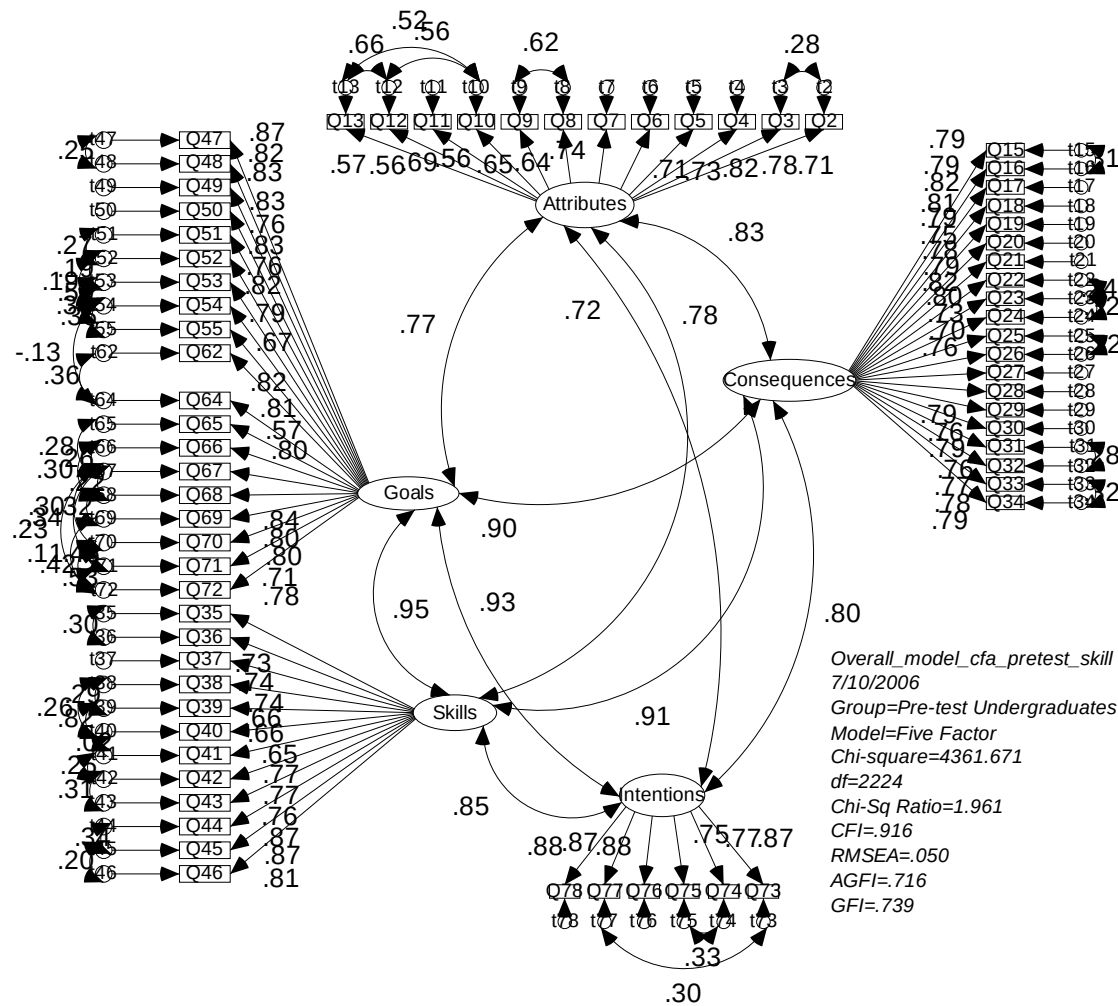


Figure 3-2 Pre-Test Data – Five-Factor Model

Table 3-4 Pre-Test Data - Reliability of Measures

<i>Construct</i>	<i>Items</i>	<i>Variance Explained</i>	<i>Coefficient of alpha</i>
Attributes	(Q2-Q13)	64.076	0.919
Consequences	(Q15-Q34)	62.490	0.968
Skill Development	(Q35-Q46)	62.218	0.944
Goals	(Q47-Q55, Q62, Q64-Q72)	65.135	0.969
Intentions	(Q73-Q78)	76.207	0.937

explained next) showed low factor loadings (0.56-0.57) for items Q10, Q12, and Q13. It was concluded that the way the attribute scale items were worded was in need of improvement. All these indicated the need for further work on the attribute scale.

As a result, a new set of 25 items were generated to reflect two aspects of the educational service attributes. The first scale is intended to capture the design characteristics related with the experience of the simulation, including software interface, instructor approach, time, and organization of simulation. This scale is named as “design”. The second scale is designed to capture the degree to which the simulation appeared to present decision situations that were realistic. The final version of the measurement instrument for the main study is in Appendix B.

Construct Validity

Construct validity was examined in terms of predictive, convergent and discriminant validity (Bagozzi, Yi, and Phillips 1991). Predictive validity is shown when correlations among constructs are substantial in magnitude and statistically significant (Garver and Mentzer 1999). These correlations should be in line with theoretical considerations. In the pre-test sample, all correlations were high and significant. The magnitude of correlations also increased as predicted by means-end theory in the order of attributes → consequences → skill development → goals → intentions (Table 3-5)

Convergent validity was indicated by the fact that the items loaded significantly on the corresponding latent construct (Figure 3-2). They all were greater than 0.50 and in the appropriate direction.

Discriminant validity was assessed by constraining the correlations among latent variables to unity (one-factor model) and comparing model fits to four-factor models (Four Factors- Skills as Consequences and Four Factors- Skills as Goals) and five-factor model (Bagozzi, Yi, and Phillips 1991). A chi-square difference test indicated whether the chi-square of the unconstrained model was significantly lower, providing evidence of discriminant validity. In pre-test sample, a five-factor model that considered skill development as lowerlevel goal/higher level consequence had the lowest chi-square value (Figure 3-3 and Table 3-3)

Table 3-5 Pre-test Data - Predictive Validity (Correlations)

<i>Order of Correlations →</i>	<i>A↔C</i>	<i>A↔S</i>	<i>A↔G</i>	<i>A↔I</i>	<i>C↔S</i>	<i>C↔G</i>	<i>C↔I</i>	<i>S↔G</i>	<i>S↔I</i>	<i>G↔I</i>	<i>Theoretical order</i>
<i>Models ↓</i>											
<i>Four Factors- Skills as Consequences</i>	<u>0.83</u>	-	0.77	0.72	-	<u>0.93</u>	0.83	-	-	<u>0.93</u>	<i>A→C→G→I</i>
<i>Four Factors- Skills as Goals</i>	<u>0.83</u>	-	0.78	0.72	-	<u>0.91</u>	0.80	-	-	<u>0.91</u>	<i>A→C→G→I</i>
<i>Five Factors- Skills as a separate construct</i>	<u>0.83</u>	0.78	0.77	0.72	<u>0.91</u>	0.90	0.80	<u>0.95</u>	0.85	<u>0.93</u>	<i>A→C→S→G→I</i>
<i>Note:</i>	Highest correlations among factors are underlined										
<i>Note:</i>	A= Attributes C=Consequences S=Skill development G=Goals I=Intentions All correlations are significant at p=0.000										

MAIN STUDY DATA ANALYSES

The main study will use structural equation modeling (SEM) as a tool to test relationships among variables. In order to test the structural theory behind the investigated phenomenon, SEM uses confirmatory or hypothesis-testing approach rather than exploratory approach. The overall objective of this method is to provide tools for theory testing (Byrne 2001).

This method is appropriate to deal with complex and multivariable data. (measured) variables to unmeasured constructs (factors). The structural model (linear regression or path analysis) specifies and estimates relationships

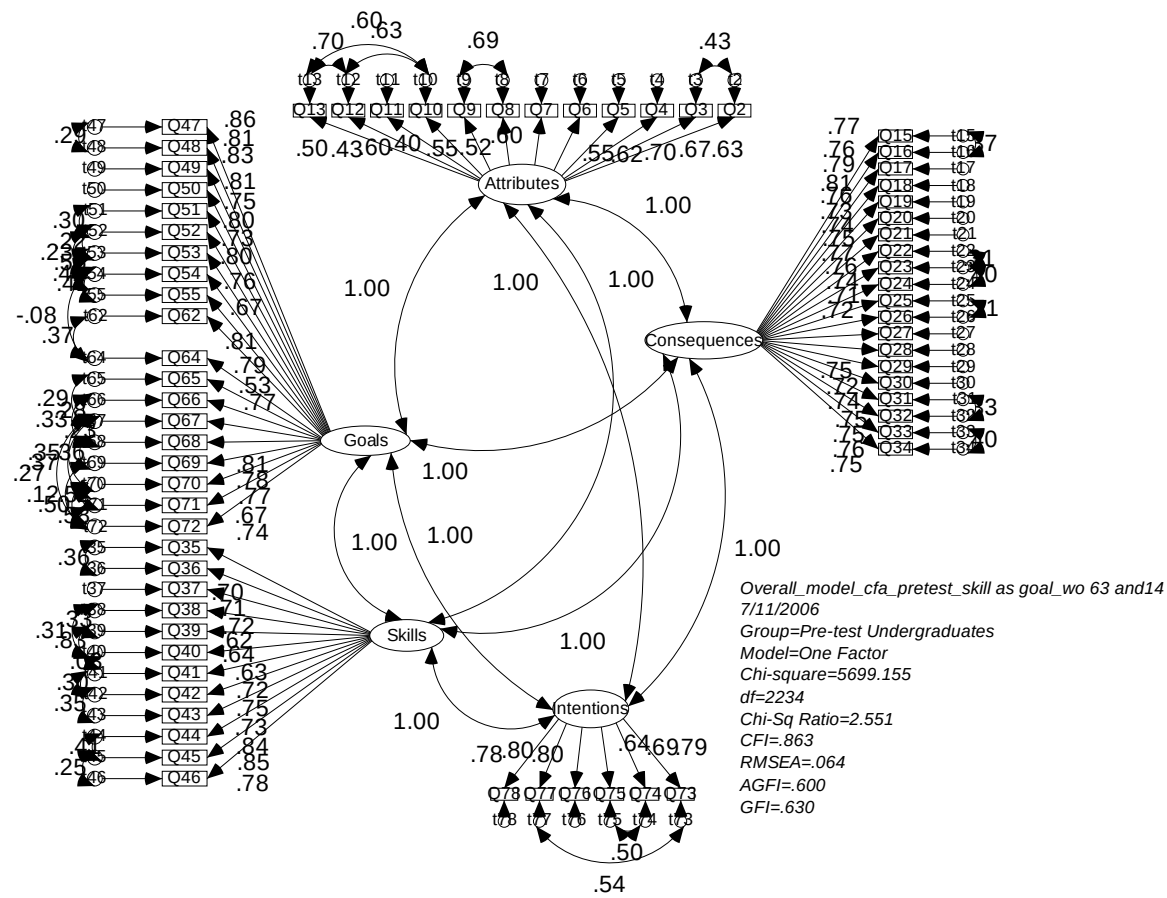


Figure 3-3 Pre-test Data - One Factor model

among unobserved (latent) constructs. Finally, goodness of fit identifies the fit between data and theoretical model.

Structural equation modeling will be helpful for testing the means-end theory, as the "... causal processes under study are represented by a series of structural (i.e. regression) equations..." (Byrne 2001, pg 3). These regression equations among various constructs will represent significant routes from lower to higher levels in means-end hierarchy.

More importantly, "... the hypothesized model can be tested statistically in a simultaneous analysis of the entire system of variables to determine the extent to which it is consistent with the data." (Byrne 2001, pg 3) The means-end hierarchy map of customer value needs to be formed and tested in a holistic manner. This method provides the needed flexibility.

If the goodness of fit is adequate, then it is reasonable to conclude that the theorized relationships among variables (in other words, hypothesized model) fit to the sample data. SEM does not provide a single statistical test of model strength; some models have a better fit than others. This is dependent on various factors such as sample size and assumptions (Marsh 1994; Rigdon 1996). Therefore, multiple indices for fit statistics are used. Some of the useful fit ratios are chi-square (CMIN- minimum discrepancy), chi-square ratio (CMIN/DF), comparative fit index (CFI), adjusted goodness of fit index (AGFI), goodness of fit index (GFI), and root mean square error of approximation (RMSEA) (Byrne 2001) .

CHAPTER SUMMARY

In order to test the theoretical model presented in Chapter II, data will be collected through a series of surveys and analyzed by utilizing structural equation modeling method (Figure 3-4). A new educational service, simulation was selected as a research context. The hierarchical map for simulation for two different groups will be investigated.

In this chapter, the research methodology was explained, drawing upon the existing literature for its justification. The details about the research design, scale development, and purification procedures are presented. These details are based on pre-test results as well as data collection and analysis procedures. The main study will be similarly conducted and reported after the data is collected.

It is important to emphasize that the research focus was on gaining insights and discovering relevant attributes, consequences, and goals within a means-end hierarchy structure by employing quantitative methods. The application of these methods was never intended to replace the traditional qualitative laddering technique, but to provide an additional perspective. The quantitative approach merely followed the logic behind the laddering technique to identify means-end chains. As the theory suggested, a researcher should not expect to find only one chain that fit to all use situations. Nor is it expected that the quantitative method would find chains that were similar to the chains that

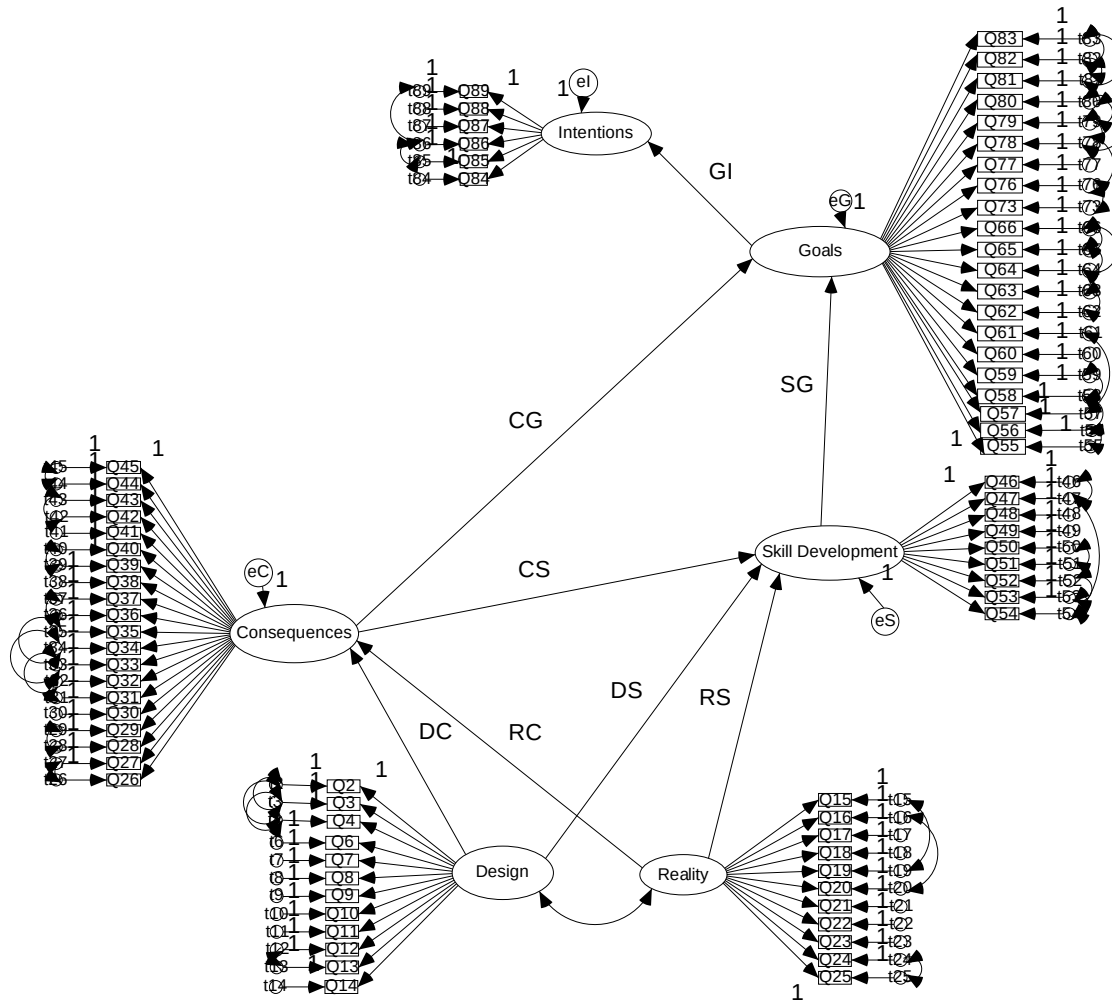


Figure 3-4 Structural Equation Model to be Tested

might be obtained by qualitative interview techniques. Nonetheless, the researcher's careful and exhaustive groundwork in developing items for attributes, consequences, and goals and the application of traditional survey method may contribute to the understanding of means-end theory.

CHAPTER 4 : *FINDINGS AND ANALYSES*

INTRODUCTION

In this chapter the main survey findings, data analysis, and results of the analyses and hypotheses are presented. In the second section of this chapter, the methods used to conduct the exploratory phase of the study and the investigation of the dominant paths within a means-end hierarchy. The latter included “importance” and “dominance analysis” (Budescu 1993; Budescu and Azen 2004; Johnson 2004; Johnson 2000; Johnson and LeBreton 2004). SPSS 14.01.1 was used to calculate descriptive statistics and Amos 6.0 was used for structural equation modeling analysis. The main study survey instrument is in Appendix B and the correlation matrix is in Appendix C. Results will be presented in the text.

DESCRIPTIVE STATISTICS

Chapter III provided details of the survey instrument, data collection procedure, and participant characteristics. Nine hundred and fifty-seven undergraduate students and 294 executives were invited to take the survey over a two-year period. Six hundred and thirty-one undergraduates and 197

executives responded to the survey, resulting in a total of 66.2% response rate(Table 4-1) . The executives were recruited from eight different administrations of a week-long course of either an Executive MBA or an Executive Development Program. The executive student sample response rate was 67.0%. The undergraduate students were recruited from three separate administrations of a junior level course in which the simulation was the central element of the course. The undergraduate student sample response rate was 65.9%. Each group of participants was compared to the respondents from the same course to determine if significant differences existed between the group under consideration and previous groups of respondents (Armstrong and Overton 1977) before compiling the data for both undergraduate and executive groups. No differences were found; therefore, non-response bias was not thought to be a concern.

The survey was administered via the web. Thirty-two undergraduate

Table 4-1 Main Study Sample Structure

Sample	Undergrads	(%)	Executives	(%)	Total	(%)
# invited	957	100	294	100	1,251	100
#responded	631	65.9	197	67.0	828	66.2
# usable	599	62.6	191	65.0	790	63.2

students and 6 executives had partially completed surveys. Because they had not completed responses to questions which related to future intentions, they were removed from the sample. The responses on the incomplete surveys were compared to the rest of the data, and no differences were found. There was no attempt to estimate and replace missing data, as the estimation procedure might influence the dominant paths in means-end hierarchies for the groups. Thus, there were a total of 790 usable surveys, 599 from undergraduates and 191 from executives.

The results of the descriptive statistics indicated a reasonable multivariate normality as suggested by skewness and kurtosis figures (Appendix D). The means ranged between 2.94 and 4.18. Standard deviations were between 0.836 and 1.261. The largest kurtosis figure was 1.657 and the largest skewness figure was [-1.209]. No influential outliers were observed.

Throughout the rest of the analysis, Amos 6.0 was used to analyze the data. The maximum likelihood estimation procedure was used, as it is rather robust against moderate violations of the multivariate normality assumption for large sample sites (greater than 100)(Steenkamp and van Trijp 1991).

SAMPLE DEMOGRAPHICS

Executives who experienced the simulation represented a wide range of companies with employee headcounts ranging from 3 to 145,000 (median = 1100). On the average, they had worked for their current employers for 3.14 years and supervised 94.4 subordinates. When they came to executive training, they already had worked for an average of 3.05 different companies. Their median age was in the 36-49 range. 76.2% of executives were male, and 23.8% were female. 2.6% were African/ American, 1.1% was American Indian, 6.9% were Asian, 82.0% were Caucasian, and 3.2 were Hispanic in ethnic origin.

In the simulation, 23.6% of executives assumed the role of President, 17.8% Vice President-Marketing, 11.0% Vice President-Sales Management, 20.9% Vice President-Manufacturing, 15.2% Vice President-Accounting and Finance, 4.7% Vice President-Marketing Research, and 6.8% Vice President-Human Resources as their primary job responsibility during the last 4 quarters. In terms of competitive position, 25.1% of participants claimed that their team placed 1st, 24.1%; 2nd, 26.2%; 3rd, 16.2%, 4th and 8.4%; 5th. Simulations involved 3, 4, or 5 teams competing against each other, and a small number of teams in 5th place were expected. For both groups, undergraduates and executives, a team's competitive position was determined by its cumulative score for the Balanced Scorecard.

Undergraduate students worked in teams of 4 or 5. Because there were more roles to play than team members, they usually carried more than one role. 13.1% of undergraduate participants assumed the role of President; 17.1%, Vice President-Marketing; 14.9% Vice President-Sales Management; 18.1%, Vice President-Manufacturing; 20.3%, Vice President Accounting and Finance; 2.8%, Vice President-Marketing Research; and 13.7%, Vice President-Human Resources as their primary role. Moreover, 24.0% of participants claimed that their team placed 1st; 26.1%, 2nd team; 24.3%, 3rd team; 17.4% 4th team; and 8.2% was in the 5th team.

CONFIRMATORY FACTOR ANALYSIS

Theory development and testing necessitate consistent validity. Structural equation modeling has proven to be a powerful tool for assessing unidimensionality, convergent validity, discriminate validity, and reliability (Steenkamp and van Trijp 1991).

Before conducting any analysis of unidimensionality, validity and reliability, Steenkamp and van Trijp (1991) suggested carrying out a purification of items using analysis techniques such as item-total correlations. In this study, correlations among items of specific constructs--attributes measured as simulation course design (Design) and realism of the situations presented in the

simulation (Reality), consequences, skill development, goals, and intentions were high, as suggested by means-end theory (Appendix C).

In order to avoid the omission of important items that may be suppressed and the inclusion of irrelevant items that may be inflated, the item-total correction criteria for scale purification were not followed. Instead, modification indices (MI) of items were investigated. MI's showing high covariances of errors among items of the same construct were allowed to correlate. Items that show highly complex relationships are reported in exploratory section of this chapter.

Byrne cautioned, "Unquestionably, the specification of correlated error terms for purposes of achieving a better fitting model is not an acceptable practice . . . such specifications must be supported by a strong substantive and/or empirical rationale" (2001, p. 110). According to this reasoning, meaningful items might be eliminated when (1) the construct consists of several subfactors, (2) some subfactors may have only one or two items, and (3) there is no previous research indicating what the subfactors might be (Steenkamp and van Trijp 1991). In this research, the above mentioned empirical rationale is sufficient to allow within construct error terms to correlate for the purpose of testing the means-end theory. The high correlations of error terms within a construct may indicate a shadow of second order construct, also there was no between-construct-error correlations which could be considered as a fatal error; hence, the model depicted in Figure 4.1 was subjected to confirmatory factor

analysis for unidimensionality, reliability, and construct validity.

As mentioned above, design and reality were two categories of attributes included in the analysis. Pre-test data identified skill development as a higher level consequence or a lower level goal. A similar analysis was repeated for two new subsets of data, undergraduates and executives.

Unidimensionality

Before carrying out any further scale purification, confirmatory factor analyses of the model depicted in Figure 4-2 were done to check item loadings and overall goodness of fit with the entire sample. Kumar and Dillon (1987) stated that the overall fit of the model provides the necessary and sufficient information to determine the unidimensionality of items.

Based on the results of the confirmatory factor analyses, the fit of the six-factor model is good. The root mean square error of approximation (RMSEA) was 0.049; the comparative fit index (CFI) was 0.906 and chi-square ratio (CMIN) was 2.862. While the one-factor model was acceptable (Figure 4-3), it is clearly inferior to the six-factor model. The review of item loadings to relevant constructs revealed that item loadings were above 0.50, except for item Q5; therefore, item Q5 was removed from the model.

The distinction between the goals scale and the skill development scale was tested by setting the correlation to one. Apparently, this model was also

Total sample_cfa_07 21 2006
 8/9/2006
 Group=Total
 Model=One Factor
 Chi-square=15516.806
 df=3189
 Chi-Sq Ratio=4.866
 CFI=.803
 AGFI=.546
 RMSEA=.070
 GFI=.575

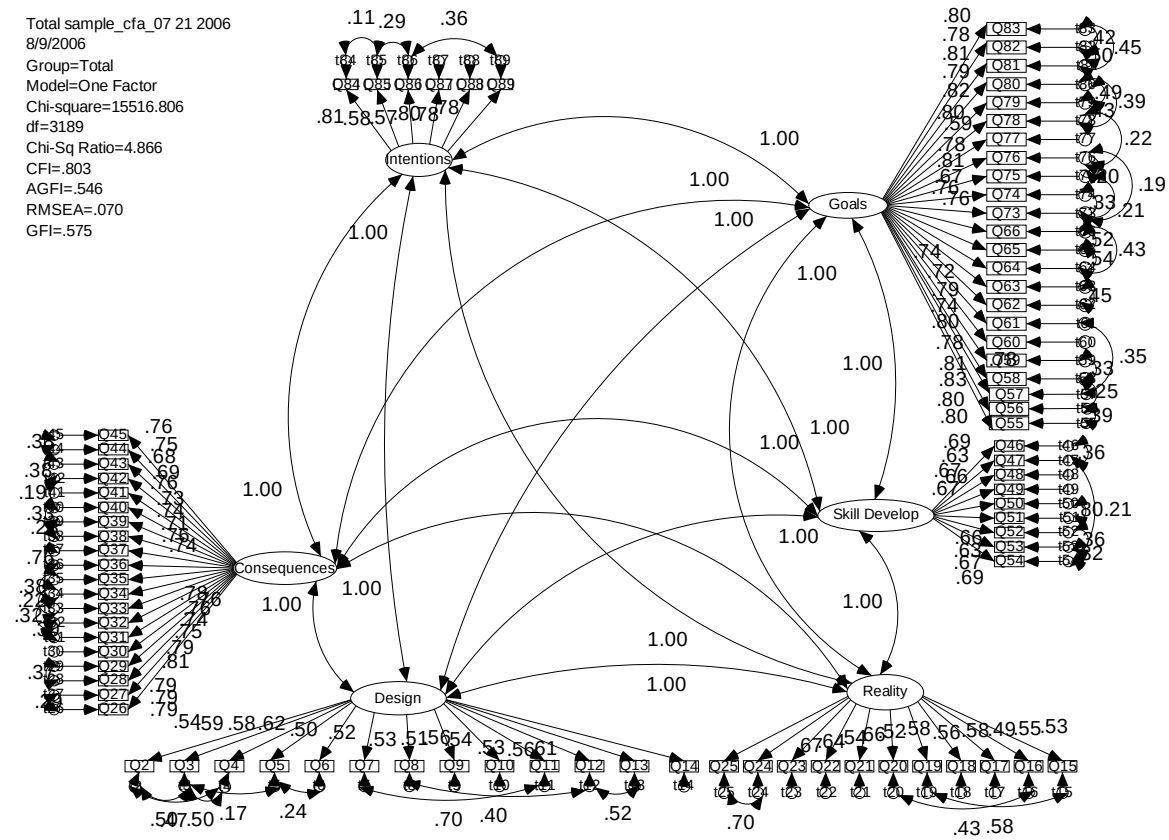


Figure 4-3 Main Study -Confirmatory Factor Analysis - One Factor Model

inferior to the six-factor model (Table 4-2). Moreover, two new dimensions of attributes--design characteristics (Design) and reality of situations in simulation (Reality) were also tested for unidimensionality by setting their correlation equal to one. This model was also inferior to the six-factor model.

Furthermore, principal component analysis of six factors indicated that one factor explains more than 50% of variance in each construct (Table 4-3), suggesting that there may be a single underlying factor for each construct under study (Steenkamp and van Trijp, 1991). Thus, it may be concluded that the six-factor model is satisfactorily unidimensional. Therefore, the six factor model was accepted with within construct error correlations for further analysis.

Reliability

In a similar fashion to the pre-test data analysis, the reliability of measures was assessed by the coefficient of alpha and variance extracted for each construct (Table 4-3). The coefficient of alpha for each construct was much higher than 0.7, and the variance extracted by the first components was higher than 0.5, indicating good reliability of constructs.

Further investigation on squared multiple correlations indicated that there were no items above 0.90 in any constructs; hence, there were no completely redundant items that needed to be removed. Q5 was problematic, due to the fact that it had a corrected item total correlation less than 0.6. Moreover, the

Table 4-2 Main Study - Confirmatory Factor Analysis - Model Comparisons

Model	Chi-Sq.	d.f.	Changes in Chi sq.*	CMIN Ratio	CFI	RMSEA	AGFI	GFI
<i>One Factor</i>	15516.81	3189	6432.87	4.866	0.803	0.070	0.546	0.575
<i>Four Factor</i> (Skills as Goals and Design = Reality)	11468.74	3183	2384.80	3.603	0.868	0.057	0.638	0.661
<i>Five Factor</i> (Skills as Goals)	9279.58	3179	195.64	2.919	0.903	0.049	0.734	0.751
<i>Five Factor</i> (Goals and Intentions)	10256.45	3178	1172.51	3.227	0.887	0.053	0.702	0.722
<i>Six Factor</i>	9083.94	3174	—	2.868	0.906	0.049	0.739	0.757
*Assuming the six-factor model is correct, all changes in chi square values are significant at $p = 0.000$								

Table 4-3 Main Study - Reliability of Measures

Construct	Items	Variance Extracted by the First Component	Initial Eigenvalues		Coefficient of Alpha
			1 st component	2 nd Component	
Design	Q2-Q14	63.53	8.26	1.32	0.950
Reality	Q15-Q25	53.13	5.84	-	0.910
Consequences	Q26-Q45	63.71	12.74	1.10	0.970
Skill Dev.	Q46-Q54	59.94	5.39	1.01	0.916
Goals	Q55-Q66 Q73-Q83	64.92	14.93	1.38	0.975
Intentions	Q84-Q89	71.37	4.28	-	0.919

information captured with this item was also captured in the reality scale; therefore item Q5 was removed. Item Q6 also had a corrected item total correlation less than 0.6. However, it was kept in the model until further evaluation for theoretical reasons. Item Q17 (with a corrected item total correlation equal to 0.564) was kept in the model for the same reason.

Construct Validity

The results obtained from the measurement model were used to examine predictive, convergent, and discriminate validity. The correlations among the constructs not only must be substantial and significant but also must be in line with theoretical considerations (Garver and Mentzer 1999; Steenkamp and van Trijp 1991). According to means-end theory, attributes (in this study design-Design and realism of the situations-Reality) have a direct effect on

consequences, which, in turn, have a direct effect on goals. Past research by Olson and Reynolds (1983) referred to the presence of higher level consequences and lower level goals, but did not describe how to detect them (Olson and Reynolds 1983).

In this specific use situation, skill development emerged as a lower level goal both in pre-test and main study data. Therefore, consequences were expected to have direct effect on skill development as well as goals and skill development was expected to have a direct effect on goals. Finally, goals are also expected to have direct effects on intentions. The order of correlations provides some evidence for the predictive validity of the model (Table 4-4).

Some evidence for convergent validity comes from the fact that items have loaded significantly and substantially on their corresponding latent constructs in the appropriate direction. Steenkamp and van Trijp (1991) suggested that a

Table 4-4 Main Study - Confirmatory Factor Analysis - Order of Correlations

From:	Design	Reality	Consequences	Skill Dev.	Goals	Intentions
→ Design	1.00					
→ Reality	0.55	1.00				
→ Consequences	<u>0.60</u>	<u>0.82</u>	1.00			
→ Skill Dev.	0.48	0.74	0.83	1.00		
→ Goals	0.57	0.77	<u>0.91</u>	<u>0.93</u>	1.00	
→ Intentions	0.54	0.69	0.82	0.79	<u>0.91</u>	1.00
Note: Highest correlations among factors are underlined						

substantial and significant item-construct factor regression coefficient for constructs provides stronger evidence for convergent validity, i.e., the correlation between the item and the construct should exceed 0.50.

In general, items loaded significantly and substantially to related constructs, but items Q5, Q74 and Q75 were problematic. The modification index of item Q5 indicated that it had cross loadings to the reality construct. The information that this item was intended to capture could also be obtained from the reality construct; therefore, this item was removed. Items Q74 and Q75 also cross-loaded to the intention construct and were removed. Significant improvements in the model were obtained by the removal of these three items (Figure 4-4).

Evidence for discriminate validity was obtained by comparing the goodness of fit of the one-factor model to the six-factor model (Bagozzi, Yi, and Phillips 1991; Steenkamp and van Trijp 1991). The correlations among constructs differed significantly and the chi-squared difference test indicated that no two constructs were perfectly correlated, which supports the discriminative validity of the six-factor model (Table 4-2)

Total sample_cfa_07 27 2006_cleaned 5_74_75
 8/9/2006
 Group=Total
 Model=Six Factor - Cleaned
 Chi-square=7998.483
 df=2942
 Chi-Sq Ratio=2.719
 CFI=.916
 AGFI=.758
 RMSEA=.047
 GFI=.775

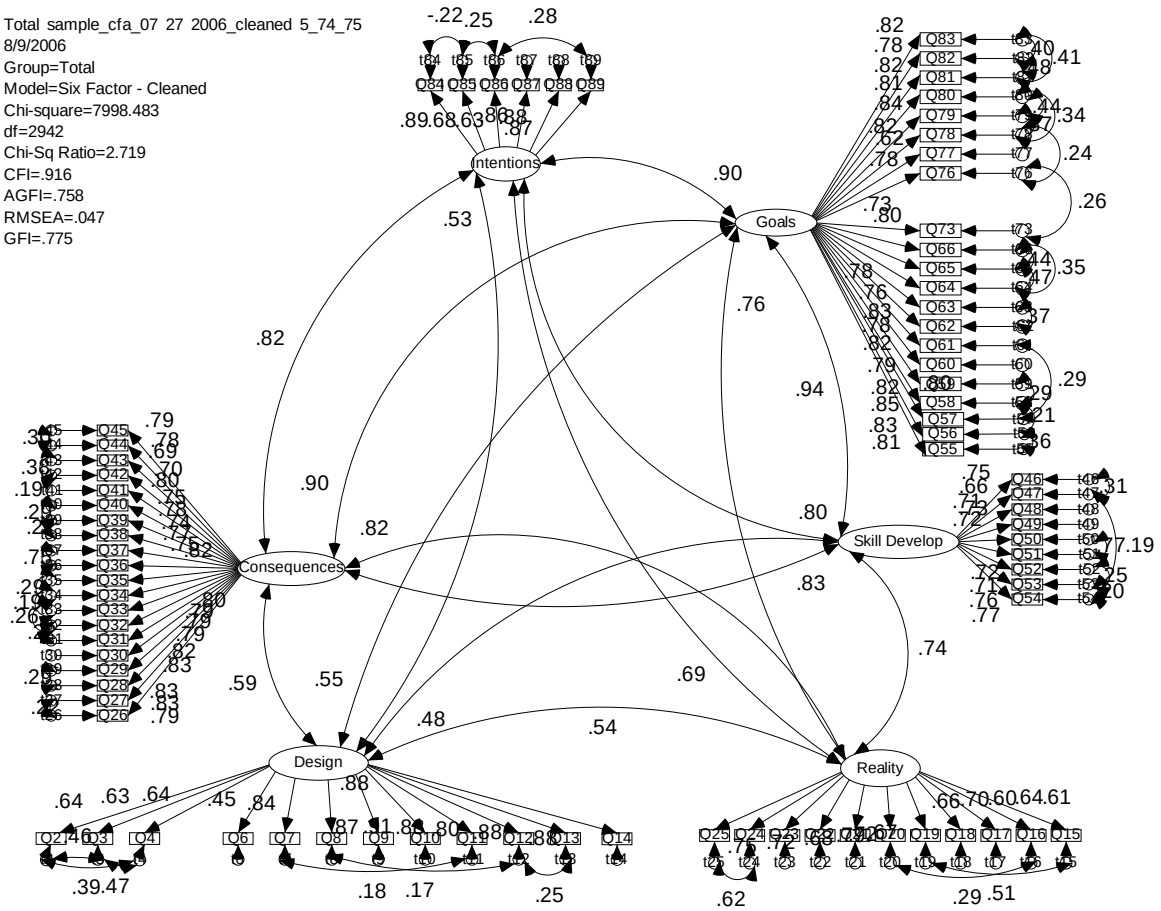


Figure 4-4 Main Study - Confirmatory Factor Analysis _ Modified Six Factor Model

HYPOTHESES TESTING AND MODEL ANALYSIS

The tests described in the previous section indicated that there were sufficient degrees of unidimensionality, reliability and validity. Based on these findings, the hypotheses introduced in Chapter II were then tested using structural equation modeling with AMOS 6.0.

The hypothesis testing was done simultaneously for undergraduate students and executives. The structural model fit indices indicated that the model fit was acceptable (Chi-square ratio=2.089, CFI=0.894, RMSEA=0.037). Table 4-5 provides an overview of the estimated effects within the structural model for undergraduate student sample depicted in Figure 4-5 and for executives sample in Figure 4-6.

Hypothesis One

The first hypothesis (H1) stated that attributes, consequences, and goals comprise different factor structures that represent different levels of means-end hierarchy. Confirmatory factor analysis showing adequate unidimensionality, predictive, discriminant and convergent validity provided acceptable evidence about the distinctiveness and hierarchical structure of the constructs. This evidence, along with finding of goodness of fit in the structural model, confirms the nomological validity of the theory under investigation (Anderson and Gerbing 1988).

Table 4-5 Main Study - Standardized Parameter Estimates

			Undergraduates				Executives			
<i>Path</i>			<i>Standardized Estimate</i>	<i>Critical Ratio</i>	<i>P Value</i>	<i>Label</i>	<i>Standardized Estimate</i>	<i>Critical Ratio</i>	<i>P Value</i>	<i>Label</i>
Consequences	←	Design	0.229	6.18	0.000	DC	0.124	2.429	0.015	DCe
Consequences	←	Reality	0.675	14.078	0.000	RC	0.797	8.970	0.000	RCe
Skill										
Development	←	Consequences	0.676	11.132	0.000	CS	0.865	5.959	0.000	CSe
Skill										
Development	←	Reality	0.181	3.376	0.000	RS	-0.016	-0.148	0.883	RSe
Skill										
Development	←	Design	0.020	0.558	0.577	DS	-0.005	-0.100	0.921	DSe
Goals	←	Consequences	0.385	10.061	0.000	CG	0.483	5.283	0.000	CGe
		Skill								
Goals	←	Development	0.621	14.031	0.000	SG	0.497	5.226	0.000	SGe
Intentions	←	Goals	0.886	24.309	0.000	GI	0.911	11.474	0.000	Gle

Test of theory_two groups_07 22 2006
 8/9/2006
 Group=Undergrads
 Model=APRIORI
 Chi-square=12315.030
 df=5896
 Chi-Sq Ratio=2.089
 CFI=.894
 AGFI=.688
 RMSEA=.037
 GFI=.709

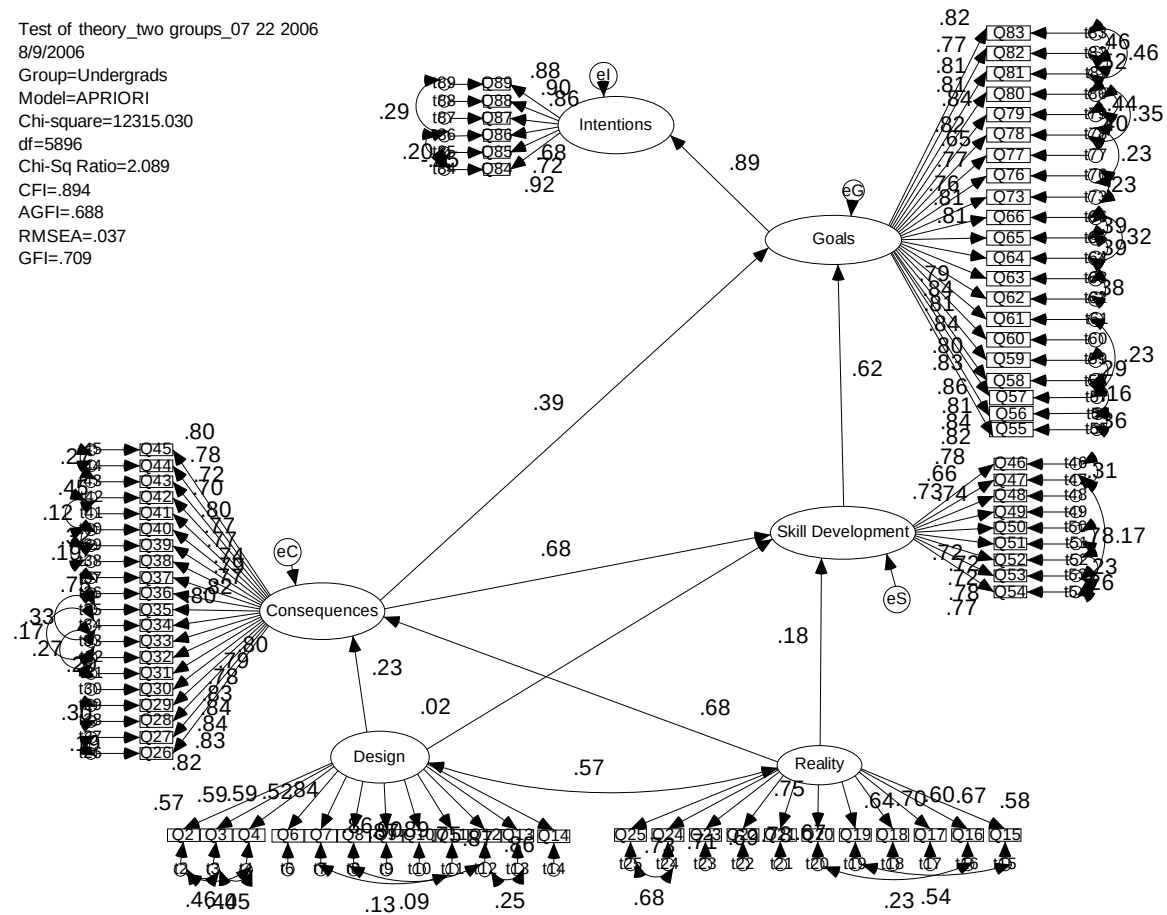


Figure 4-5 Main Study - Test of Means-End Theory in Undergraduate Sample

Test of theory_two groups_07 22 2006
8/9/2006
Group=Executives
Model=APRIORI
Chi-square=12315.030
df=5896
Chi-Sq Ratio=2.089
CFI=.894
AGFI=.688
RMSEA=.037
GFI=.709

Path diagram showing relationships between latent variables (Intentions, Goals, Consequences, Design, Reality, Skill Development) and their indicators. Standardized path coefficients are displayed on the arrows. Error terms (eI, eC, eS) are also shown.

Latent Variables and their Indicators:

- Intentions: Q89, Q88, Q87, Q86, Q85, Q84, Q83, Q82, Q81, Q80, Q79, Q78, Q77, Q76, Q75, Q74, Q73, Q72, Q71, Q70, Q69, Q68, Q67, Q66, Q65, Q64, Q63, Q62, Q61, Q60, Q59, Q58, Q57, Q56, Q55
- Goals: Q45, Q44, Q43, Q42, Q41, Q40, Q39, Q38, Q37, Q36, Q35, Q34, Q33, Q32, Q31, Q30, Q29, Q28, Q27, Q26
- Consequences: Q25, Q24, Q23, Q22, Q21, Q20, Q19, Q18, Q17, Q16, Q15, Q14, Q13, Q12, Q11, Q10, Q9, Q8, Q7, Q6, Q5, Q4, Q3, Q2, Q1
- Design: Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q8, Q9, Q10, Q11, Q12, Q13, Q14, Q15, Q16, Q17, Q18, Q19, Q20, Q21, Q22, Q23, Q24, Q25, Q26, Q27, Q28, Q29, Q30, Q31, Q32, Q33, Q34, Q35, Q36, Q37, Q38, Q39, Q40, Q41, Q42, Q43, Q44, Q45
- Reality: Q46, Q47, Q48, Q49, Q50, Q51, Q52, Q53, Q54, Q55, Q56, Q57, Q58, Q59, Q60, Q61, Q62, Q63, Q64, Q65, Q66, Q67, Q68, Q69, Q70, Q71, Q72, Q73, Q74, Q75, Q76, Q77, Q78, Q79, Q80, Q81, Q82, Q83, Q84, Q85, Q86, Q87, Q88, Q89
- Skill Development: Q90, Q91, Q92, Q93, Q94, Q95, Q96, Q97, Q98, Q99, Q100, Q101, Q102, Q103, Q104, Q105, Q106, Q107, Q108, Q109, Q110, Q111, Q112, Q113, Q114, Q115, Q116, Q117, Q118, Q119, Q120, Q121, Q122, Q123, Q124, Q125, Q126, Q127, Q128, Q129, Q130, Q131, Q132, Q133, Q134, Q135, Q136, Q137, Q138, Q139, Q140, Q141, Q142, Q143, Q144, Q145, Q146, Q147, Q148, Q149, Q150, Q151, Q152, Q153, Q154, Q155, Q156, Q157, Q158, Q159, Q160, Q161, Q162, Q163, Q164, Q165, Q166, Q167, Q168, Q169, Q170, Q171, Q172, Q173, Q174, Q175, Q176, Q177, Q178, Q179, Q180, Q181, Q182, Q183, Q184, Q185, Q186, Q187, Q188, Q189, Q190, Q191, Q192, Q193, Q194, Q195, Q196, Q197, Q198, Q199, Q200, Q201, Q202, Q203, Q204, Q205, Q206, Q207, Q208, Q209, Q210, Q211, Q212, Q213, Q214, Q215, Q216, Q217, Q218, Q219, Q220, Q221, Q222, Q223, Q224, Q225, Q226, Q227, Q228, Q229, Q230, Q231, Q232, Q233, Q234, Q235, Q236, Q237, Q238, Q239, Q240, Q241, Q242, Q243, Q244, Q245, Q246, Q247, Q248, Q249, Q250, Q251, Q252, Q253, Q254, Q255, Q256, Q257, Q258, Q259, Q260, Q261, Q262, Q263, Q264, Q265, Q266, Q267, Q268, Q269, Q270, Q271, Q272, Q273, Q274, Q275, Q276, Q277, Q278, Q279, Q280, Q281, Q282, Q283, Q284, Q285, Q286, Q287, Q288, Q289, Q290, Q291, Q292, Q293, Q294, Q295, Q296, Q297, Q298, Q299, Q300, Q301, Q302, Q303, Q304, Q305, Q306, Q307, Q308, Q309, Q310, Q311, Q312, Q313, Q314, Q315, Q316, Q317, Q318, Q319, Q320, Q321, Q322, Q323, Q324, Q325, Q326, Q327, Q328, Q329, Q330, Q331, Q332, Q333, Q334, Q335, Q336, Q337, Q338, Q339, Q340, Q341, Q342, Q343, Q344, Q345, Q346, Q347, Q348, Q349, Q350, Q351, Q352, Q353, Q354, Q355, Q356, Q357, Q358, Q359, Q360, Q361, Q362, Q363, Q364, Q365, Q366, Q367, Q368, Q369, Q370, Q371, Q372, Q373, Q374, Q375, Q376, Q377, Q378, Q379, Q380, Q381, Q382, Q383, Q384, Q385, Q386, Q387, Q388, Q389, Q390, Q391, Q392, Q393, Q394, Q395, Q396, Q397, Q398, Q399, Q400, Q401, Q402, Q403, Q404, Q405, Q406, Q407, Q408, Q409, Q410, Q411, Q412, Q413, Q414, Q415, Q416, Q417, Q418, Q419, Q420, Q421, Q422, Q423, Q424, Q425, Q426, Q427, Q428, Q429, Q430, Q431, Q432, Q433, Q434, Q435, Q436, Q437, Q438, Q439, Q440, Q441, Q442, Q443, Q444, Q445, Q446, Q447, Q448, Q449, Q450, Q451, Q452, Q453, Q454, Q455, Q456, Q457, Q458, Q459, Q460, Q461, Q462, Q463, Q464, Q465, Q466, Q467, Q468, Q469, Q470, Q471, Q472, Q473, Q474, Q475, Q476, Q477, Q478, Q479, Q480, Q481, Q482, Q483, Q484, Q485, Q486, Q487, Q488, Q489, Q490, Q491, Q492, Q493, Q494, Q495, Q496, Q497, Q498, Q499, Q500, Q501, Q502, Q503, Q504, Q505, Q506, Q507, Q508, Q509, Q510, Q511, Q512, Q513, Q514, Q515, Q516, Q517, Q518, Q519, Q520, Q521, Q522, Q523, Q524, Q525, Q526, Q527, Q528, Q529, Q530, Q531, Q532, Q533, Q534, Q535, Q536, Q537, Q538, Q539, Q540, Q541, Q542, Q543, Q544, Q545, Q546, Q547, Q548, Q549, Q550, Q551, Q552, Q553, Q554, Q555, Q556, Q557, Q558, Q559, Q560, Q561, Q562, Q563, Q564, Q565, Q566, Q567, Q568, Q569, Q570, Q571, Q572, Q573, Q574, Q575, Q576, Q577, Q578, Q579, Q580, Q581, Q582, Q583, Q584, Q585, Q586, Q587, Q588, Q589, Q590, Q591, Q592, Q593, Q594, Q595, Q596, Q597, Q598, Q599, Q600, Q601, Q602, Q603, Q604, Q605, Q606, Q607, Q608, Q609, Q610, Q611, Q612, Q613, Q614, Q615, Q616, Q617, Q618, Q619, Q620, Q621, Q622, Q623, Q624, Q625, Q626, Q627, Q628, Q629, Q630, Q631, Q632, Q633, Q634, Q635, Q636, Q637, Q638, Q639, Q640, Q641, Q642, Q643, Q644, Q645, Q646, Q647, Q648, Q649, Q650, Q651, Q652, Q653, Q654, Q655, Q656, Q657, Q658, Q659, Q660, Q661, Q662, Q663, Q664, Q665, Q666, Q667, Q668, Q669, Q670, Q671, Q672, Q673, Q674, Q675, Q676, Q677, Q678, Q679, Q680, Q681, Q682, Q683, Q684, Q685, Q686, Q687, Q688, Q689, Q690, Q691, Q692, Q693, Q694, Q695, Q696, Q697, Q698, Q699, Q700, Q701, Q702, Q703, Q704, Q705, Q706, Q707, Q708, Q709, Q710, Q711, Q712, Q713, Q714, Q715, Q716, Q717, Q718, Q719, Q720

Figure 4-6 Main Study -- Test of Means-End Theory in Executive Sample

Hypothesis Two

Hypothesis 2 (H2) stated that in a test of the structural relationships among attributes, consequences, goals and behavioral intentions, attributes will have direct effects on consequences. Attributes in the model were measured with two constructs, simulation course design elements (Design) and realism of the situations presented in the simulation (Reality). H2 was supported by positive direct effects between Design and Reality constructs and consequences in both samples.

The links between Reality and Skill development and Design and skill development were also tested. If skill development was a higher level consequence, these constructs might have direct effect on it as well. Only the path from Reality to skill development was significant with a standardized estimate of 0.181, and only in the undergraduate sample. The path from consequences to skill development was stronger in comparison, positive in direction, and significant for both samples. Moreover, the link from skill development to goals was also strong and significant. These results provided evidence that skill development actually was a lower level goal for both samples and that it could have direct effects on higher level goals.

Hypothesis Three

Hypothesis Three (H3) stated that in a test of the structural relationships among attributes, consequences, goals and behavioral intentions, consequences will have direct effect on goals. Strong, significant, and positive standardized path estimates in both samples provided support for this hypothesis.

Hypothesis Four

Hypothesis Four (H4) stated that in a test of the structural relationships among attributes, consequences, goals and behavioral intentions, goals will have direct effects on behavioral intentions. The data supported this hypothesis for both samples as there were strong, significant, and positive direct effects from goals to intentions.

EXPLORATORY PHASE

Theory testing with structural equation modeling yielded distinct categories of attributes, consequences, goals and behavioral intentions. The next step was to identify goals that have the strongest influence on the behavioral intentions for each group separately. Once these goals were identified, consequences influencing each specific goal could also be found. This approach was the reflection of qualitative analysis in which significant direct and indirect

relationships among elements were represented in the implications matrix after the categorization of attributes, consequences, and lower and higher level goals.

Investigating the Dominant Path

As explained in the chapter 3, laddering technique requires the formation of score and implication matrixes. Implication matrix is constructed from score matrix, and it displays the number of times each element leads to each other element. It is a square matrix, where direct and indirect relationships are represented. Chains are constructed from the matrix of aggregate relations, utilizing cut-off levels (usually 3 to 5 relations in a sample of 50-60 individuals) to get rid of the unimportant relationships. As Reynolds and Gutman (1988) mentioned “the criteria for evaluating the ability of the overall map to represent the data is to assess the percentage of all relations among elements accounted for by the mapped elements (p. 21).” In other words, the goal of mapping hierarchical relations is to interconnect all important and meaningful chains on a map.

Similar to the qualitative laddering approach, the goal of the quantitative method is to identify and interconnect all important and meaningful chains in a map using statistical methods. As an exploratory approach, the use of correlation matrix (a square matrix similar to implication matrix) that displays degree of association of each variable with each other variable may be helpful to identify meaningful relationships.

One way of investigating mathematical relationships between a dependent variable and other predictor variables is multiple linear regression method where correlation coefficient (R^2) gives the strength of linear relationship among the variables. The objective of this study is to identify and interconnect all important and meaningful chains by utilizing a series of multiple linear regressions starting with average intentions scale as a dependent variable, and individual goal items as the highest level predictors in a means-end chain. Once the most important goals are identified, this time each goal item will be used as a dependent or criterion variable and lower level goals (skill development), and consequences will be used as predictors of each goal items. This step identifies the specific lower level goals and/or consequences which are influential in predicting each specific higher level goal. The last set of regression analysis will be done to identify specific attributes as predictors of each important lower level goal and consequence items.

Multiple regression analysis helps researchers to predict the amount by which a criterion score would be expected to increase (decrease) as the result of a unit increase (decrease) in a given predictor score, when all other predictors are constant. The predictive power of the model is indicated by R^2 . Multiple regression analysis also helps researchers to explain the extent to which each variable contributes to the prediction of the criterion. Some variables are more important than others. Theoretically importance can be measured by using

regression coefficients of each predictor variables (Johnson, LeBretoni 2004).

Multiple linear regression method also helps to measure relative importance among predictive variables. Relative importance is defined as “the proportionate contribution that each predictor makes to R^2 , considering both its direct effect (i.e., its correlation with the criterion) and its effect when combined with the other variables in the regression equation. (Johnson, Le Breton, 2004, p. 240).”

The common method of investigating relative importance of predictors is to examine the regression coefficients and/or the zero-order correlations with the criterion. When predictor variables do not correlate among each other, the zero-order correlations with the criterion variable and standardized regression coefficients are equivalent. R^2 is the sum of these coefficients.

However, if the predictor variables correlate among each other, the interpretation of important predictors, as well as criterion variable, becomes difficult and often misleading, as illustrated by the following example: If there are 3 predictors (X_1, X_2, X_3) of Y . X_1 and X_3 are highly correlated with Y . However, X_2 is moderately correlated with Y . Moreover, X_1 and X_3 are also very highly correlated with each other, but are not highly correlated with X_2 . Once X_1 is included in the regression model, X_3 will not make any additional contribution to the prediction of Y . Hence, it will appear less important than X_2 in the presence of X_1 . Similarly, once X_3 is in the model, X_1 will appear to be less

important than X_2 (Azen and Budescu 2003). If all three variables enter to the model, X_2 will be given more importance than it deserves. If one of the variables have negative beta coefficient, it becomes even more difficult to interpret the results at all. Moreover, if there are multiple highly correlating predictor variables in the model, variance inflation factors cannot distinguish among several simultaneously high correlations and can not signal multicollinearity (Neter, Kutner, Nachtsheim, and Wasserman 1996).

Due to the nature of means-end hierarchy research, correlations among variables are expected to be high and significant. (Appendix C). In the presence of very high correlations, common methods of measuring importance become unusable. The size of the beta weights depend on the other predictors included in the model. If a predictor has a positive zero-order correlation but a negative beta, the interpretation of beta becomes impossible. Darlington (1990, 1968) suggested using the increase in R^2 associated with adding the predictor to the other predictors in the model as a measure of “usefulness” of a predictor. However, this usefulness measure is also influenced by multicollinearity.

To solve this relative importance of predictors in the presence of high multicollinearity problem, Budescu (1993) introduced dominance analysis as a technique to determine (1) the rank of predictor variables in terms of importance, (2) the quantitative measure of importance. Dominance analysis is the comparison of the average increase in R^2 obtained by adding a predictor variable

(x_i) to each possible subset models. In other words, “for any two predictor variables, x_i and x_j , let x_h stand for any subset of remaining $p-2$ predictors in the set, variable x_i dominates x_j if, and only if:

$$R^2_{y.x_i x_h} > R^2_{y.x_j x_h}$$

for all possible choices of x_h (Johnson and LeBreton 2004, p.246). If adding x_i to all possible subset models will always generate a greater increase in R^2 than adding x_j to all possible subset models, then it is safe to conclude that x_i dominates x_j .

Once the analysis is completed for each variable, it is possible to come up with an order that reflects the importance of predictor variables. Sometimes predictive ability of one variable does not exceed that of another in all subset regressions. Then a dominance relationship cannot be established between these two variables. If these two variables dominate all the other variables in all subset regressions, both can be considered as equally important and dominating the rest of the variables. The details of the analysis can be found in Budescu (1993) and a SAS macro that executes dominance analysis can be found in Azen and Budescu (2003).

The average increase in R^2 associated with a variable across all possible sub models is a theoretically sound way to set the complete dominance of one variable over others (Budescu 1993). A major drawback of this method is the fact that the computational complexity exponentially increases as the number of predictor variables increase. For 10 predictors, there are $2^{10}-1=1,023$ sub models.

For the number of variables above 10, the computational requirements of this method causes it to be impractical to use (for 15 variables, the number of sub models = 32,767). In order to overcome this difficulty; a prescreening approach has been used. Johnson (2000) proposed a variable transformation method as an alternative solution to the problem of identifying relative importance in the presence of correlated variables.

Johnson (2000) suggests creating a set of variables that are highly related to the original set of variables, but are uncorrelated with each other, and then regressing original predictors on the orthogonal variables. The regression coefficients will be assigned to uncorrelated variables. A detailed explanation of how original set of variables were transformed to orthogonal variables can be found at Johnson, 2000. He found that the most successful transformation was the least squares orthogonalization that yields a set of orthogonal variables that are maximally similar to original variables. This approach also produces very similar relative weights to those obtained by Budescu method.

A limitation of Johnson model is the fact that relative weights (ϵ :Epsilon) should not be used to identify the best subset of variables for prediction purposes. Johnson's relative weights are a measure of importance of a predictor variable relative to other predictor variables included in the model. Epsilons cannot replace multiple regression method, but give an idea about the most important variables (among many correlated variables) that can be pulled to the Budescu's dominance analysis in order

to find the complete dominance of a predictor variable over other predictor variables. Johnson (2004) also suggested that “when comparing relative weights for the same predictor across populations, relative weights should be expressed as proportion of R^2 ” (Johnson 2004, p. 289).

In this dissertation, relative weights (ϵ) of variables in subcategories of goals, skill development, consequences, attributes (design and reality) were statistically calculated according to the theoretical hierarchy. For example, average intention scale was used as criterion variable, and skill development items as well as goal items were used as predictor variables (a total of 21 predictor variables). Running the importance analysis (Johnson 2000) and calculating the Epsilons indicated that there were most important goal items using the Epsilon index for the executives sample. The variables and their Epsilon indices are in Table 4-6.

Table 4-6 Goal items and Epsilon Indices - Executives Sample

Important Goal Items That Predict Average Intention (Total Sample)	Epsilon Indices
Q83	0.1027
Q81	0.0898
Q64	0.0813
Q79	0.0667
Q78	0.0621
Q80	0.0591
Q82	0.0575

At this point, epsilons did not give information about the best order of variables. For example, the difference in the epsilon indices of Q81 and Q64 is very small. Is the difference significant? Does Q81 dominate Q64? Can they be considered equally important? Therefore the above mentioned seven goal items are tested for rank order in the dominance analysis.

The results of ($2^7-1=127$) subset comparisons indicated that Q81, Q83 and Q64 dominated all other variables; hence they were the most important variables and were at the dominant path from intentions up to attributes (Table 4-7).

On the secondary path, the Q79 was the most important variable that dominated the rest of the variables including Q78, Q82 and Q80. The tertiary

Table 4-7 Dominance Sequence for Goal Items - Executive Sample

Dominance:	Q81, Q83, Q64 > D > Q79 > D > Q78, Q82, Q80
Relative importance:	20.33% 18.10% 18.67% > D > 14.19% > D > 11.34% 11.82% 11.56%
Note: "> D >" indicates a complete domination of the variables on the left over the variables on the right.	

path variables were Q80, Q76, and Q73. These variables can be treated as equally important.

Q81 was identified as a goal on the dominant path. Another set of regression analysis using Q81 as the criterion variable, and consequences as predictor variables were done in a similar manner. Starting with importance analysis, the 12 most important variables were identified, and they were analyzed for complete dominance in dominance analysis. This analysis approach was repeated for executive and undergraduate samples.

Bartlett-Box Homogeneity tests indicated that executive group and undergraduate group had statistically significantly different covariance matrices (Box's $M = 6774.5$, $F = 1.42$, $F \text{ Prob} = 0.000$, Chi Square = 5642.2 and Chi-Square Prob = 0.000). As a result, the analysis of dominant paths had been done separately for each group. The data was not aggregated for the total sample analysis. The results of these series of analyses were summarized in tables 4-8 and 4-9.

Discussion of Results for Executives

The results of dominance analysis and the series of regressions indicated that executives and undergraduate students had different hierarchical maps (See Table 4-8 and Table 4-9 for details). Executives had also a shorter, to-the-point map compared to undergraduate students. Future intentions for both groups include the same items, such as positive word-of-mouth communication,

Table 4-8 Means-End Hierarchy Map for Executive Sample - Results of Dominance Analysis

Level of Hierarchy	Executive Sample		Predictor Variables											
Dependent Variable	% Contribution of Dominant Path to R ²		Dominant Path			Secondary Paths					Tertiary Paths			
	R ²													
<i>From: Goals To: Intentions</i>	0.695	99.7%	<u>Q64</u>	<u>Q81</u>	<u>Q83</u>	<u>Q79</u>						<u>Q78</u>	<u>Q80</u>	<u>Q82</u>
<u>Average Intentions</u>														
Importance.														
Relative Importance														
<i>From: Skills and Consequences To: Goals</i>	0.382	99.0%	<u>Q54</u>			<u>Q43</u>	<u>Q46</u>	<u>Q47</u>	<u>Q51</u>	<u>Q52</u>				
<u>Q64</u>														
Importance														
Relative Importance														
<i>From: Skills and Consequences To: Goals</i>	0.702	73.5%	<u>Q29</u>	<u>Q37</u>	<u>Q54</u>	<u>Q27</u>	<u>Q30</u>	<u>Q31</u>	<u>Q48</u>			<u>Q33</u>		
<u>Q81</u>														
Importance														
Relative Importance														

Table 4-8 (Continued)

Level of Hierarchy	Executive Sample		Predictor Variables										
Dependent Variable	% Contribution of Dominant Path to R²		Dominant Path	Secondary Paths				Tertiary Paths					
	R²												
<u>Q83</u> Importance Relative Importance <i>From: Consequences</i> <i>To: Skills</i>	0.540	54.3%	<u>Q54</u> 0.131 24.3%	<u>Q26</u> 0.076 14.1%	<u>Q33</u> 0.069 12.7%	<u>Q48</u> 0.072 13.3%	<u>Q51</u> 0.075 13.7%	<u>Q37</u> 0.053 9.9%	<u>Q46</u> 0.062 11.6%				
<u>Q54</u> Importance Relative Importance <i>From: Design and Reality</i> <i>To: Consequences</i>	0.512	61.3%	<u>Q43</u> 0.087 17.0%	<u>Q36</u> 0.053 10.3%	<u>Q42</u> 0.064 12.4%			<u>Q30</u> 0.050 9.7%	<u>Q34</u> 0.060 11.6%	<u>Q35</u> 0.052 10.1%	<u>Q37</u> 0.041 7.9%	<u>Q41</u> 0.054 10.6%	<u>Q44</u> 0.053 10.3%
<u>Q29</u> Importance Relative Importance	0.458	77.3%	<u>Q25</u> 0.168 36.7%	<u>Q22</u> 0.112 24.4%				<u>Q15</u> 0.040 8.6%	<u>Q18</u> 0.044 9.7%	<u>Q20</u> 0.038 8.2%	<u>Q24</u> 0.057 12.4%		

Table 4.8. (Continued)

Level of Hierarchy	Executive Sample		Predictor Variables							
Dependent Variable	R ²	% Contribution of Dominant Path to R ²	Dominant Path			Secondary Paths			Tertiary Paths	
<u>Q37</u> Importance Relative Importance	0.348	78.4%	<u>Q25</u> 0.104 29.9%	-	-	<u>Q6</u> 0.033 9.6%	<u>Q19</u> 0.066 19.1%	<u>Q24</u> 0.068 19.7%	-	<u>Q15</u> 0.032 9.2% <u>Q22</u> 0.043 12.5%
<u>Q43</u> Importance Relative Importance	0.268	98.9%	<u>Q14</u> 0.070 26.0%	<u>Q21</u> 0.069 25.6%	<u>Q22</u> 0.077 28.7%	<u>Q17</u> 0.052 19.5%	-	-	-	-

Level of Hierarchy	Item	Description of Items on the Dominant Path
Goal	Q64	Simulation helped me to improve my image among my peers.
Goal	Q81	The benefits to me were worth the time I have invested in the simulation.
Goal	Q83	My intellectual gain far surpassed the effort I invested in the simulation
Skill Development	Q54	Development of my Persuasive communication skills
Consequence	Q29	Develop a thought process that you can carry into the real world
Consequence	Q37	Excite your drive to excel in the market.
Consequence	Q43	I learned how to utilize team dynamics to improve business decisions.
Reality of Situations	Q21	Distribution
Reality of Situations	Q22	Integration of all business functions
Reality of Situations	Q25	Tactical execution of strategy
Design	Q14	My instructor helped us to realize the important learning points of the simulation.

Note: Only the items that are on the dominant paths were included in the descriptions below. Refer to appendix for all other items.

Table 4-9 Means-End Hierarch map for Undergraduate Sample - Results of Dominance Analysis

Level of Hierarchy	Undergrad. Sample		Predictor Variables											
Dependent Variable	% Contribution of Dominant Path to R²		Dominant Path				Secondary Paths					Tertiary Paths		
From: Goals To: Intentions Average Intentions Importance Relative Importance	0.756	87.6%	Q83	Q73			Q76	Q78	Q79	Q81	Q82			
			0.126	0.103			0.095	0.112	0.105	0.109	0.108			
			16.6%	13.6%			12.5%	14.8%	13.9%	14.4%	14.2%			
From: Skills and Consequences To: Goals Q83 Importance Relative Importance	0.598	88.5%	Q29	Q37	Q49		Q26	Q51	Q52	Q50		Q28	Q36	Q53
			0.079	0.069	0.064		0.061	0.056	0.054	0.056		0.056	0.053	0.049
			13.2%	11.5%	10.8%		10.2%	9.4%	9.1%	9.4%		9.5%	8.8%	8.1%
Q73 Importance Relative Importance	0.550	83.3%	Q26	Q40	Q46	Q48	Q27	Q31	Q33	Q36	Q45			
			0.076	0.064	0.059	0.053	0.063	0.058	0.057	0.059	0.062			
			13.7%	11.6%	10.7%	9.7	11.5%	10.5%	10.3%	10.6%	11.3%			

Table 4-9 (Continued)

Level of Hierarchy	Undergrad. Sample		Predictor Variables								
Dependent Variable	R ²	% Contribution of Dominant Path to R ²	Dominant Path		Secondary Paths				Tertiary Paths		
<i>From: Consequences To: Skills</i>											
<u>Q46</u>	0.477	77.8%	<u>Q26</u>	<u>Q36</u>	<u>Q30</u>	<u>Q42</u>	<u>Q43</u>	<u>Q45</u>	<u>Q29</u>	<u>Q31</u>	<u>Q37</u>
Importance			0.066	0.060	0.056	0.047	0.051	0.057	0.047	0.044	0.048
Relative Importance			13.7%	12.7%	11.7%	9.9%	10.7%	11.9%	9.9%	9.3%	10.1%
<u>Q48</u>	0.420	91.4%	<u>Q26</u>	<u>Q33</u>	<u>Q35</u>	<u>Q29</u>			<u>Q36</u>	<u>Q37</u>	<u>Q42</u>
Importance			0.052	0.052	0.068	0.051			0.039	0.043	0.035
Relative Importance			12.3%	12.5%	16.2%	12.2%			9.3%	10.1%	8.4%
<u>Q49</u>	0.407	87.5%	<u>Q26</u>	<u>Q42</u>		<u>Q28</u>	<u>Q29</u>	<u>Q30</u>	<u>Q44</u>		
Importance			0.084	0.069		0.067	0.066	0.059	0.062		
Relative Importance			20.7%	17.0%		16.5%	16.1%	14.6%	15.2%		
<i>From: Design and Reality To: Consequences</i>											
<u>Q26</u>	0.547	83.9%	<u>Q7</u>	<u>Q17</u>	<u>Q22</u>	<u>Q24</u>	<u>Q2</u>	<u>Q3</u>	<u>Q18</u>	<u>Q15</u>	<u>Q16</u>
Importance			0.066	0.055	0.068	0.065	0.055	0.058	0.055	0.039	0.039
Relative Importance			12.1%	10.0%	12.4%	11.8%	10.0%	10.5%	10.1%	7.1%	7.1%

Table 4-9 (Continued)

Level of Hierarchy	Undergrad. Sample		Predictor Variables													
Dependent Variable	R ²	% Contribution of Dominant Path to R ²	Dominant Path				Secondary Paths					Tertiary Paths				
<u>Q29</u> Importance Relative Importance	0.508	94.1%	<u>Q2</u> 0.061 12.1%	<u>Q6</u> 0.051 10.1%	<u>Q22</u> 0.077 15.1%	<u>Q25</u> 0.076 15.0%	<u>Q3</u> 0.050 9.9%	<u>Q18</u> 0.054 10.6%	<u>Q19</u> 0.046 9.0%	<u>Q16</u> 0.042 8.4%						
<u>Q33</u> Importance Relative Importance	0.464	78.0%	<u>Q3</u> 0.051 10.9%	<u>Q22</u> 0.062 13.3%	<u>Q16</u> 0.042 9.1%					<u>Q19</u> 0.042 9.0%	<u>Q4</u> 0.040 8.6%				<u>Q6</u> 0.034 7.4%	
<u>Q35</u> Importance Relative Importance	0.488	48.2%	<u>Q18</u> 0.064 13.2%	<u>Q3</u> 0.056 11.5%					<u>Q4</u> 0.046 10.9%	<u>Q16</u> 0.053 10.8%	<u>Q22</u> 0.054 11.1%	<u>Q24</u> 0.053 10.9%	<u>Q2</u> 0.038 7.8%	<u>Q6</u> 0.034 7.1%	<u>Q20</u> 0.043 8.8%	<u>Q25</u> 0.047 9.5%
<u>Q36</u> Importance Relative Importance	0.378	88.1%	<u>Q2</u> 0.051 13.5%	<u>Q6</u> 0.055 14.4%	<u>Q18</u> 0.059 15.7%	<u>Q24</u> 0.052 13.6%	<u>Q20</u> 0.038 10.0%	<u>Q22</u> 0.043 11.4%	<u>Q25</u> 0.049 13.0%	<u>Q16</u> 0.031 8.3%						

Table 4-9 (Continued)

Level of Hierarchy	Undergrad. Sample		Predictor Variables									
Dependent Variable	R ²	% Contribution of Dominant Path to R ²	Dominant Path				Secondary Paths					Tertiary Paths
<u>Q37</u> Importance Relative Importance	0.385	88.3%	<u>Q6</u> 0.048 12.4%	<u>Q18</u> 0.064 16.6%	<u>Q25</u> 0.059 15.4%		<u>Q2</u> 0.044 11.5%	<u>Q3</u> 0.047 12.2%	<u>Q16</u> 0.037 9.6%	<u>Q20</u> 0.040 10.4%	<u>Q24</u> 0.046 12.0%	
<u>Q40</u> Importance Relative Importance	0.400	71.8%	<u>Q18</u> 0.176 17.0%	<u>Q22</u> 0.181 18.7%			<u>Q3</u> 0.122 13.6%	<u>Q4</u> 0.111 13.2%	<u>Q6</u> 0.098 10.4%	<u>Q24</u> 0.079 12.8%	<u>Q25</u> 0.086 14.3%	
<u>Q42</u> Importance Relative Importance	0.337	94.1%	<u>Q4</u> 0.058 17.3%	<u>Q15</u> 0.053 15.6%	<u>Q18</u> 0.070 20.6%	<u>Q22</u> 0.066 19.6%	<u>Q25</u> 0.053 15.8%					<u>Q17</u> 0.037 11.0 %

Level of Hierarchy	Item	Description of Items on the Dominant Path
Goal	Q73	I appreciate the expertise of those who designed the simulation for me.
Goal	Q83	My intellectual gain far surpassed the effort I invested in the simulation
Skill Development	Q46	Development of my Leadership skills
Skill Development	Q48	Development of my Marketing skills
Skill Development	Q49	Development of my Manufacturing skills

Table 4-9 Continued

Level of Hierarchy	Item	Description of Items on the Dominant Path
Consequence	Q26	Learn how to use the tools of management in managing the firm.
Consequence	Q29	Develop a thought process that you can carry into the real world
Consequence	Q33	Help you to see how the business world might react to your decisions and the decisions of your competitors.
Consequence	Q35	Test your ability to react to market feedback in an environment where a misstep could result in lost market share and/or profits.
Consequence	Q36	Excite your competitive spirit.
Consequence	Q37	Excite your drive to excel in the market.
Consequence	Q40	I learned a great deal about responding to unforeseen circumstances in a business environment.
Consequence	Q42	I learned how to work outside of the box or outside of my comfort zone.
Reality of Situations	Q15	Finance
Reality of Situations	Q17	Human Resources
Reality of Situations	Q18	Operations / Manufacturing
Reality of Situations	Q22	Integration of all business functions
Reality of Situations	Q24	Strategic planning
Reality of Situations	Q25	Tactical execution of strategy
Design	Q2	The simulation was well organized.
Design	Q3	The thought process underlying the simulation was understandable.
Design	Q4	The explanations regarding the work to be done in the simulation were easy to follow.
Design	Q6	There was enough time to think through the problems presented in the simulation.
Design	Q7	My instructor provided individualized attention throughout the simulation.

future use of material in their careers, and the use of simulation as a yardstick to measure other courses. An average intention scale was calculated and used as a criterion variable, whereas goal items served as predictor variables in the first step of linear regression series.

Goals of Executives

Seven goals emerged as important in the regression model. Three goals dominated all others. They could be considered equally important for executives. The first two reflected the time and effort elements of the extrinsic value dimension. Executives believed that the benefits they received from the simulation experience were worth the time they have invested in the simulation (Q81) and their intellectual gain far surpassed the effort they invested (Q83). The third dominant goal belonged to the status aspect of others-oriented dimension of the value typology. Executives thought that the simulation has helped them to improve their image among their peers (Q64). This goal had not emerged as an important goal for undergraduates.

The secondary goals of the dominance analysis were important goals as well. As Budescu (1993) mentioned, the goal in the second set dominated the rest of the goal items in all possible subsets. However, it did not dominate the goal items in the first set, namely Q81, Q83, and Q 64. An important secondary goal is related to the control aspect of the active value dimensions, namely personal accomplishment (Q79). Tertiary goals belong to intrinsic value dimension – fun

and play(Q78), extrinsic value dimension – input/output (Q82) and active value dimension – being in control (Q80). The R^2 of this model is 0.695 and dominant goals' contribution to this R^2 is 99.7% (Figure 4-7).

Skills that Executive Developed

The skill development was theorized as a part of active value dimension in terms of developing expertise in various areas in the initial item development. SEM modeling indicated that they were most probably lower level goals. The dominant skill that entered to all three models for predicting extrinsic goals of invested time (Q81) and money (Q83) vs. intellectual gains, as well as improving

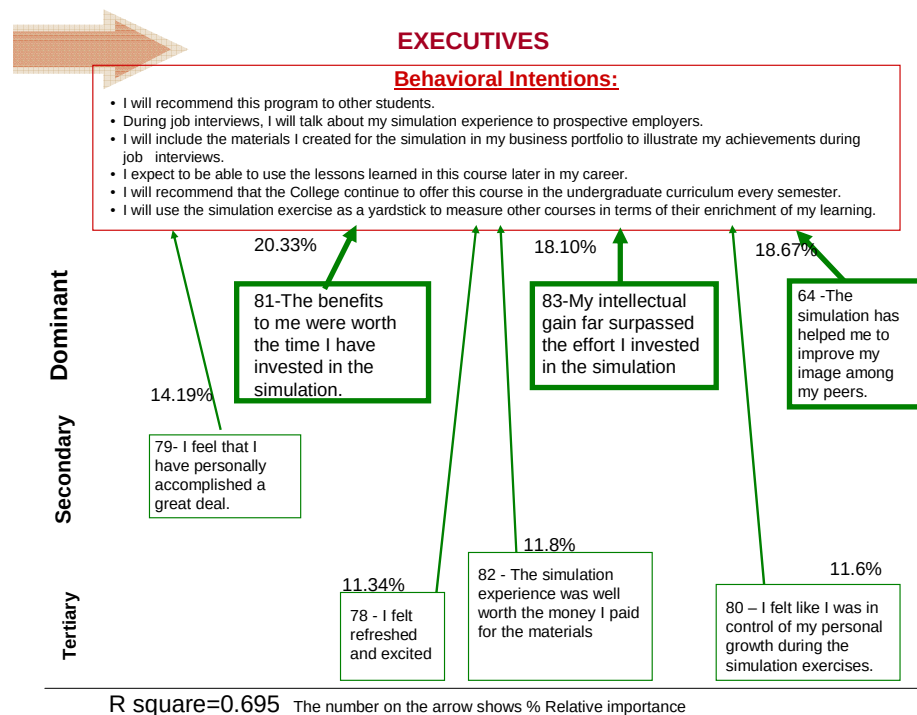


Figure 4-7 Dominant Goals for Executives

image among peers (Q64) is the persuasive communication skills (Q54). It is extremely important to develop this skill for executives to improve their image among peers (% contribution to R^2 of this item = 99.0%). It is also important for achieving intellectual gains for the invested effort (% contributions to R^2 = 54.3%). The dominant path was in Figure 4-8.

Other important skills that are worth to mention include leadership (Q46), teamwork (Q47), marketing (Q48), accounting (Q51), and human resource management (Q52) for all three goals. The skills that have direct impact on the improvement of their image among their peers (Q64) are Q46, Q47, Q51, and Q52. Development of their marketing skill (Q48) influences their goals of achieving benefits for the time invested (Q81) and gaining intellectually for the effort invested (Q83). Development of accounting skills (Q51) influences also Q83.

Consequences that Executives Experienced

Among multiple consequences, three dominant consequences stand out for the executives. Development of a thought process that executives can carry into the real world (Q29) and exciting their drive to excel in the market (Q37) emerged as the two dominant consequences that have an impact on the goal of benefits vs. the time invested (Q81). The third dominant consequence is the fact that executives learned how to utilize team dynamics to improve business decisions (Q43). This consequence has a direct impact on the development of

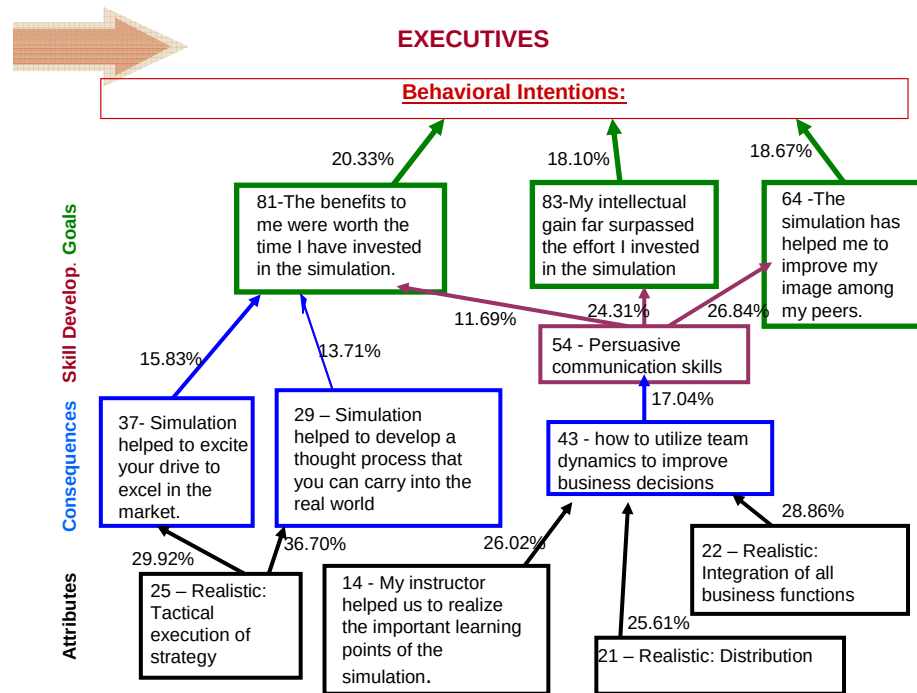


Figure 4-8 Means-End Hierarchy Map for Executive Sample – Dominant Path

persuasive communication skills (Q54).

As mentioned before, development of persuasive communication skills (Q54) and two other consequences (Q29 and Q37) are on the dominant paths leading to the goal items of Q64, Q81, and Q83. They contribute to 99.0% of the R^2 for the linear regression on Q64, 73.5% of R^2 for the linear regression on Q81, and 54.3% of R^2 for the linear regression on Q83. Other important consequences that contribute to Q83 and that are not on the dominant path include Q26 (learn how to use tools of management in managing the firm), and Q33 (see how the business world might react to my decisions and my competitors' decisions).

Important consequences in the regression model of Q81 are Q27 (learn important business concepts, principles and ways of thinking), Q30 (instill a bottom line focus and the simultaneous need to deliver customer value), and Q31 (crystallize the financial implications of business decisions).

In the development of persuasive communication skills, Q36 (exciting competitive spirit) and Q42 (learning how to work outside the box or comfort zone) are important consequences. These consequences, however, are not in the dominant path of the executive's hierarchical path.

Attributes That Led to Dominant Consequences for Executives

The realism of situations in the tactical execution of the strategy (Q25) was extremely important to help executives to develop a thought process that they can carry into the real world (Q29). This attribute was also essential in exciting the executives' drive to excel in the market (Q37). The realism of situations in terms of integration of all business functions (Q22), on the other hand, was a critical attribute for executives to learn how to utilize team dynamics to improve business decisions (Q43). Another equally important attribute for that consequence was the realism of distribution function (Q21). Finally, executives appreciated their instructors' help to realize the important learning points of the simulation (Q14). The involvement of instructor as a course design attribute contributed to the experience of learning how to utilize team dynamics to improve business decisions (Q43).

Discussion of the Results for the Undergraduate Student Sample

Goals of Undergraduate Students

The regression analysis revealed that there were seven important goals for undergraduates ($R^2 = 0.756$). However, two of these goals dominated the rest of the goals. They contribute 87.6% to the R^2 . Undergraduate students, similar to executives, believed that their intellectual gain far surpassed the effort they invested in simulation (Q83). (Extrinsic dimension – input/output aspect.) Unlike executives, the second dominant goal belonged to reactive value dimension. They appreciated the expertise of those who designed the simulation exercise for them (Q73) (Figure 4-9).

Other important goals belong to extrinsic, intrinsic, and active dimensions. Undergraduate students thought that simulation experience was worth the time they invested (Q81) and the money (Q82) they spent. They also had fun in competing in the simulation (Q76), and they got refreshed and excited (Q78). Finally, they felt they have accomplished a great deal (Q79).

The next linear regression series continued by considering each goal item as the criterion variable and skill development and consequences items as predictor variables. As the number of criterion variables increase, the number of linear regressions increases geometrically. In order to keep the model understandable and simple, only dominant variables were discussed in detail. The complete map of the dominant path was in Figure 4-10. This figure is quite

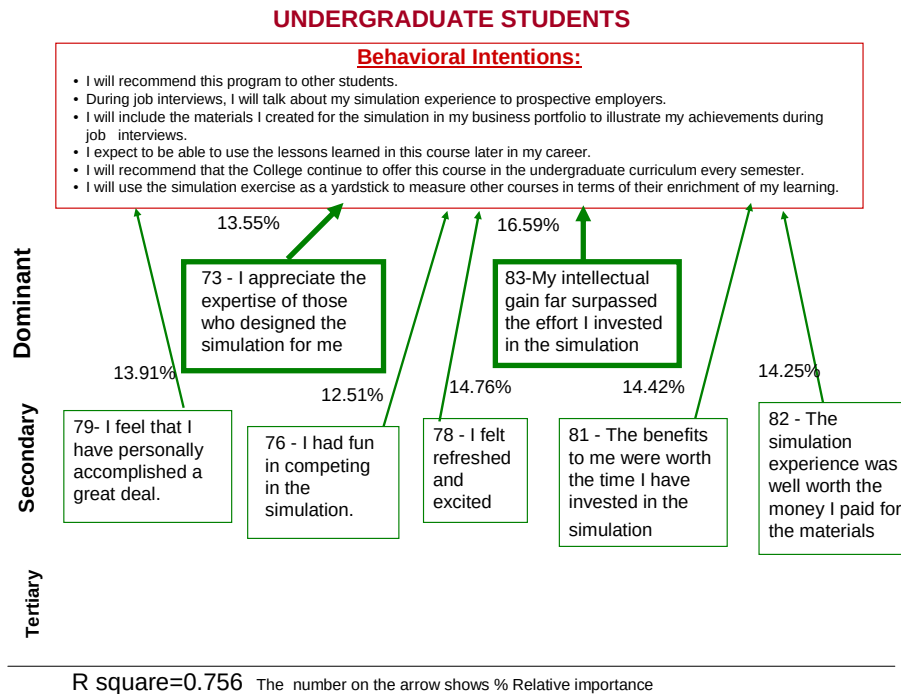


Figure 4-9 Dominant Goals for Undergraduate Students

complex and will be explained in two parts that lead to the dominant two goals, namely, their intellectual gain that far surpassed the effort they invested in simulation (Q83) and their appreciation of the expertise of those who designed the simulation exercise for them (Q73).

Skills that Undergraduate Students Developed

While executives had more goals and only one skill item in the dominant path of their hierarchical map, undergraduates have three dominant skill development areas. The dominant skills include leadership (Q46), marketing

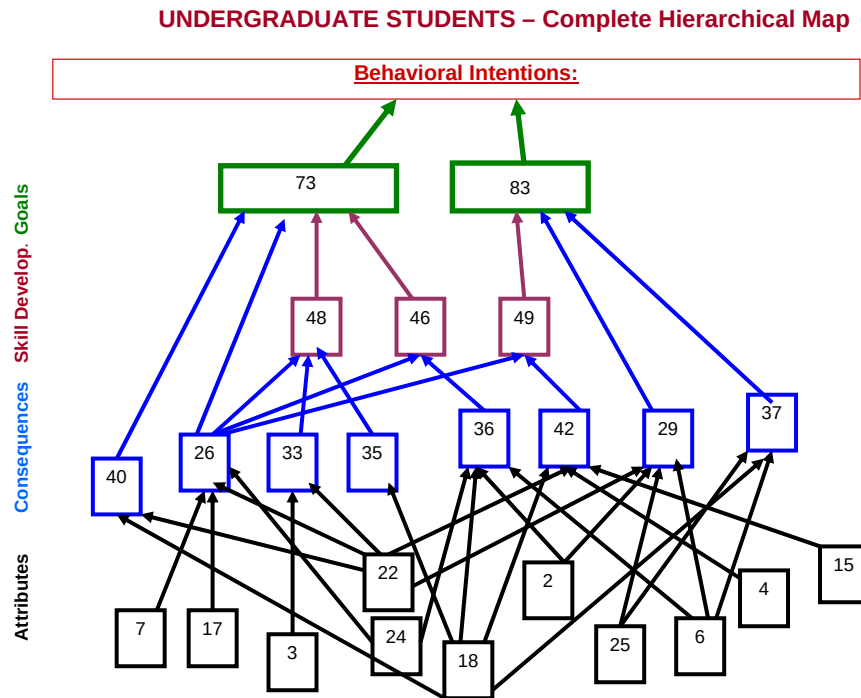


Figure 4-10 Means-End Hierarchy Map for Undergraduate Sample – Dominant Path

(Q48), and manufacturing (Q49). The development of leadership and marketing skills had a direct impact on their appreciation of the expertise of those who designed the simulation (Q73). The development of their manufacturing skill had a direct impact on their goal of getting intellectual gain from the simulation in the amount of effort they invested (Q83).

Some other important skills that they developed include financial (Q50), accounting (Q51), human resource management (Q52), and e-commerce (Q53). All these four skills have direct impact on the goal of intellectual gain vs. effort

invested (Q83). However, these four skills were not included in further analysis in order to keep the study focused on the dominant path.

Dominant Path Leading to the Goal of Intellectual Gain versus Effort Spent (Q83)

The dominant path leading to the goal of obtaining intellectual gain versus the effort invested in simulation is in Figure 4-11. Reaching towards this goal, the dominant skill development happened in the area of manufacturing and operations for undergraduate students (Q49). The two consequences that had a direct impact on the above mentioned higher level goal were the development of a thought process that the students can carry into the real world (Q29) and exciting their drive to excel in the market (Q37). In the development of students' manufacturing skills two consequences were influential. One was learning how to use tools of management (Q26). The other consequence was learning how to work outside of the box or outside of their comfort zone (Q42).

Similar to the first partial map leading to Q73, there were multiple attributes that made the students to experience these four consequences. Realism of the integration of business functions (Q22) and Realism of operations and manufacturing module (Q18) were important. Realism of strategic planning (Q24) and human resources module (Q17) were important for learning how to use tools of management (Q26) as well as instructor providing individualized attention (Q7).

UNDERGRADUATE STUDENTS – Partial Hierarchical Map

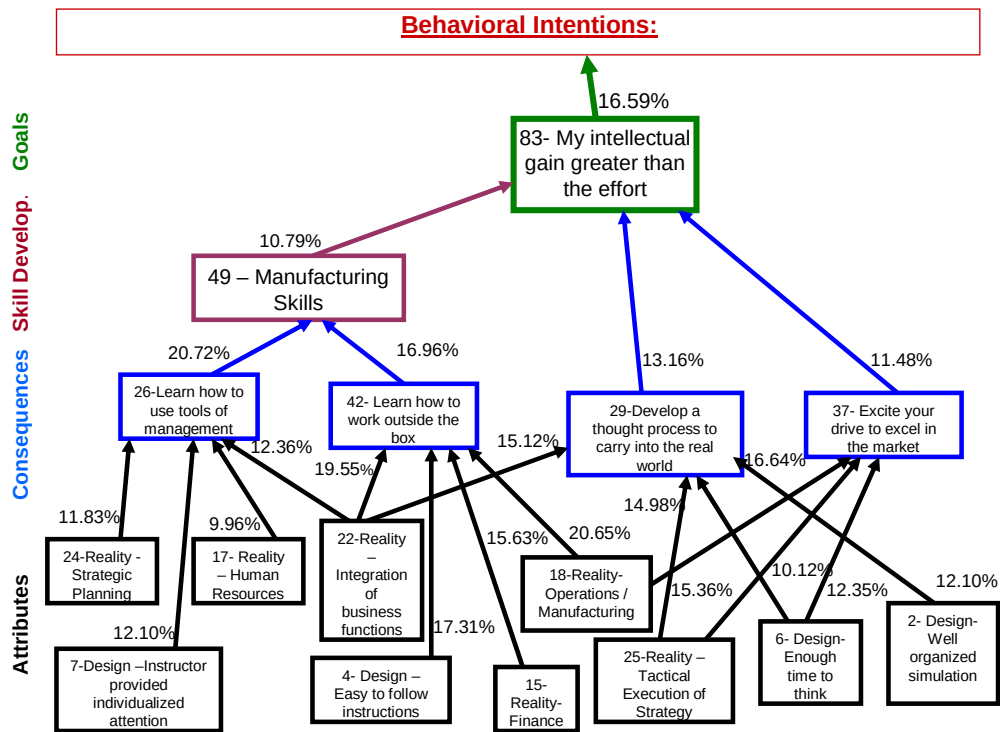
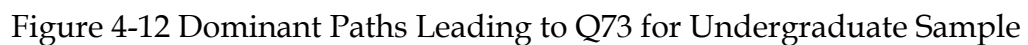


Figure 4-11 Dominant Paths Leading to Q83 for Undergraduate Sample

Realism of the finance module (Q15) and easy to follow instructions as design element helped students to work outside the box (Q42). Realism of tactical execution of strategy had impact on two consequences, namely developing a thought process to carry into the real world (Q29) and exciting their drive to excel in the market (Q37). Design element of enough time to think through the problems presented in the simulation (Q6) had impact on these two consequences too. Finally, well organized simulation (Q2) helped students to develop a thought process to carry into the real world (Q29)

The dominant path leading to the goal of appreciation of the expertise of designers of simulation is in Figure 4-12. Developing Marketing (Q48) and Leadership (Q46) skills were the lower level goals leading to this higher level goal. Furthermore, the consequences that had direct impact on achievement of this goal were learning a great deal about responding to unforeseen circumstances in a business environment (Q40) and learning how to use the tools of management in managing the firm (Q26). The later consequence was an important one in the development of both marketing and leadership skills as well.



Exciting students' competitive spirit (Q36) was another important consequence that led to the development of leadership skills. There were two more important consequences that were influential in the development of marketing skills. They were experiencing how the business world might react to students' decisions and the decisions of their competitors (Q33) and testing their ability to react to market feedback in an environment where a misstep could result in lost market share and/or profits (Q35).

Multiple attributes from Design and Reality aspects of the simulation make the students to experience the five above mentioned consequences. Two attributes were worth to mention before others. First, realism of integration of business functions (Q22) had impact on learning how to respond unforeseen circumstances (Q40), learning how the business world might react to decisions (Q33) and learning how to use tools of management (Q26). Next, realism of operations and manufacturing (Q18) module influenced students' experiences on learning how to respond unforeseen circumstances (Q40), testing their ability to react to market (Q35) and exciting their competitive spirit (Q36).

Realism of strategic planning module (Q24) influences both learning how to use tools of management (Q26) and exciting their competitive spirit (Q36). Realism of the human resources (Q17) module influenced learning how to use tools of management (Q26) as well.

Among the design of the simulation course attributes, time-to-think (Q6)

and well organized simulation (Q2) had impact on exciting students' competitive spirit (Q36). Instructor providing individualized attention (Q7) helped learning how to use tools of management (Q26). Finally, understandable thought process (Q3) helped them learn how the business world might react to decisions (Q33).

CHAPTER SUMMARY

A review of the findings of the main study, data analysis, and the testing of means-end theory were the main focus points of this chapter. Results indicate that there was significant evidence about the applicability of means-end theory to identify which aspects of the educational service contribute the most to the achievement of end states/goals. All proposed hypotheses were supported (Table 4.10). In other words, the links between product/service attributes and consumption experience could be established using quantitative methods.

To achieve this end, the exploratory part of the study introduced the dominance and importance analysis to identify the dominant path in the presence of multicollinearity. The analysis is based upon the two separate samples of executive and undergraduate students, as these two groups were found to be drastically different from each other.

In the final chapter, the author reviews 1) the interpretations of the findings presented here, 2) the limitations of the study, and the opportunities for future research.

Table 4-10 Summary of Means-End Theory Testing

Hypotheses Number	Details	Result
<i>Hypothesis 1:</i>	<i>Attributes, consequences, and goals will comprise different factors.</i>	Supported (Confirmatory Factor Analysis and goodness of fit indices)
<i>Hypothesis 2:</i>	<i>In a test of the structural relationships among attributes, consequences, goals and behavioral intentions, attributes will have direct effect on consequences.</i>	Supported (Positive direct effects from attributes to consequences in both samples)
<i>Hypothesis 3:</i>	<i>In a test of the structural relationships among attributes, consequences, goals and behavioral intentions, consequences will have direct effect on goals.</i>	Supported (Positive direct effects from consequences to goals in both samples)
<i>Hypothesis 4:</i>	<i>In a test of the structural relationships among attributes, consequences, goals and behavioral intentions, goals will have direct effect on behavioral intentions.</i>	Supported (Positive direct effects from goals to intentions in both samples)
<i>Proposition 1:</i>	<i>The hierarchical map for users of simulation (as an educational service) with limited business experience (undergraduate students) will be different from the hierarchical map of users with considerable business experience (executives).</i>	Supported (Dominance and Importance Analysis results)

CHAPTER 5 : *DISCUSSION AND CONCLUSIONS*

INTRODUCTION

The purpose of this dissertation is to understand and explain the hierarchical process which constitutes the delivery and consumption of a service through the application of means-end theory. Toward this end, a holistic evaluation of the hierarchical structure of the service attributes, desired (undesired) consequences, and goal achievements was undertaken by utilizing a quantitative approach. This research addresses the need for more empirical research on estimating and controlling the creation of customer value in various use situations (Flint, Woodruff, and Gardial 2002; Slater 1997; Slater and Narver 2000; Woodruff 1997). Because little research has been done on the services marketing domain in means-end hierarchy theory (Bagozzi and Dabholkar 2000), the focus of this study is on the use of a business simulation as an educational service.

RESEARCH QUESTIONS

The primary question addressed by this research is whether it is possible to discover relevant attributes, consequences and goals within a means-end structure for an educational service using quantitative research methods. The

significance of this endeavor is twofold: First, means-end hierarchy theory is a powerful framework for understanding what superior customer value means from the customer's point of view by relating attributes of products/services (in other words - means) to customers' desired goals (ends that customers want to achieve). Historically, researchers have relied on qualitative research and the laddering technique to investigate customers' means-end hierarchies'. Second, the study was conducted to understand two groups of "customers' evaluations" of an educational service in terms of its utility for attaining desired goals in a holistic manner.

Means-end theory suggests that attributes, consequences and goals comprise different factors that are ordered in increasing levels of abstraction (Olson and Reynolds 1983). Attributes are at the lowest level of hierarchy, as they are designed and offered by service providers, and they provide the means to produce specific consequences for customers. Desirable or undesirable consequences, in turn, help customers to achieve their goals that are shaped by the situation.

This dissertation represents a pioneering opportunity to test the means-end theory via survey methods and statistical techniques and to offer a new methodological approach for hierarchical categorization of attributes, consequences and goals using quantitative methods. This statistical categorization opens up avenues to investigate individual attributes that lead to

specific consequences that, in turn, let the respondents achieve certain goals. The linkages that identified by this method were quantifiable; therefore, it was possible to find dominant significant paths from important attributes to relevant consequences to specific goals.

As discussed in the first chapter, services typically have technical and functional characteristics which render them difficult to design, implement and control. This dissertation investigated the relationships between technical characteristics (attributes of a service) and functional characteristics (consequences of the attributes) for two groups of customers – executives and undergraduate students. The **dominance and importance analyses** identified differences between the means-end hierarchies of experienced (executives) and inexperienced (undergraduates) customers of the same educational service.

Test of Means-End Theory

The first research question posed was whether it is possible to employ quantitative research methods to discover relevant attributes, consequences and goals within a means-end hierarchy structure. The results revealed that the elements of means-end theory indeed have a hierarchical structure. This result also clarifies some issues that are being discussed in the means-end theory domain. In exploring the nature of the linkages, Gutman listed seven key issues with respect to laddering method. This dissertation addresses three of those issues, including:

- “1. *DIRECTION: In what direction should the linkages run?*
2. *HOW MANY: how many links are there? How many elements should be represented in a chain?*
3. *HOW STRONG: How strong are the linkages between various elements connecting product to self or “the values level”?”*(1991, p144)

The first issue has to do with the fact that the linkages are presumed to go from concrete attributes to abstract values in order to connect product to self. The objective of laddering is to uncover directionality in the relationship between adjacent elements. Even though there was no empirical evidence about the correctness of this presumption, the results often were analyzed and presented in line with this presumption. This dissertation provides evidence for its validity. Indeed, attributes were found to be at the lowest level of the hierarchy and goals were at the highest level.

The second issue has to do with the question of “how many”. This issue was also discussed by Grunert and Grunert (1995). In principle, the implication matrix could have been transferred to a map showing all the cognitive categories. In reality however, such a map would not have been desirable, because the results would have been difficult to interpret.

In order to show the most important links, cut-off levels were assigned. But applying different cut-off levels, one can produce drastically different hierarchical maps. Means-end literature does not provide explicit guidance

directions on how to choose cut-off levels. This omission becomes problematic as sample sizes increase. Utilization of SEM modeling and dominance-importance analysis eliminates the need for cut-off levels altogether.

Grunert and Grunert (1995) suggested using clustering methods for aggregation that involve a transition from individual maps to collective maps. They argued that, because a simple 2-3 level ladder obtained from an individual respondent only reveals limited insight into the cognitive structure of one individual, it cannot provide insights into the cognitive structures of the group to which the individual belongs. They explained that the overall cognitive structure of a group is not a collection of single chains, but rather an interrelated network of associations. To fully characterize a homogeneous group's cognitive structure, quantitative methods are necessary. In this dissertation, quantitative methods have been used to identify two homogeneous groups' cognitive structures.

As discussed in the literature review on quantitative approaches to analyzing ladders, clustering approaches have largely been preferred by the majority of researchers in this field. Clustering methods rely on measuring the semantic space to identify dominant chains, that is, the ones that produced the least distance.

A major drawback of this method is that, as the number of dominant clusters increases, the average distance between dominant chains and their assigned ladders decreases. As a result, the method automatically eliminates

embedded paths in order to give a clear definition of clusters. Unfortunately, this also eliminates the richness of interpretation. In this dissertation, the dominance and importance analyses allowed for richer interpretation of the data, because there was no automatic elimination of embedded paths, as demonstrated by the extremely complex hierarchical maps associated with the cognitive structures of undergraduate students.

The third issue has to do with the question of whether or not frequency equals strength. Gutman stated that the laddering method that uses the “why” probe actually amounts to one response (zero or one) per respondent. When responses are aggregated, the important paths give the most frequently mentioned elements; thus, the frequency of responses may not express the strength of relationships. Probes regarding the strength of relationships during a laddering interview may hinder the process of uncovering linkages. Hence, Gutman proposed the use of post hoc analytical methods to investigate the strength of relationships. The quantitative method employed in this dissertation research may be instrumental in conducting a post hoc analysis.

Another debate in the means-end theory domain is concerned with whether or not laddering reveals the consumption -relevant knowledge stored in human memory (Grunert and Grunert 1995) and reflected by internal cognitive processes. Bagozzi and Dabholkar (2000) have suggested that it is now time to embrace both the thinking and feeling components if researchers in this domain

want to understand and explain human behavior. Interestingly, the results of this study indicated that cognitive and emotional goals were equally important in the consumption experience of a business simulation as an educational service.

Intellectual gain was found to be a dominant goal for both groups. Cognitions about what was gained versus what was given were important for evaluating the degree to which the simulation helped students to achieve their intellectual gain goals. This result was in line with a research that characterizes customer value as a “trade-off” analysis (Zeithaml 1988).

As mentioned above, the dominant goals not only were cognitive in nature but also were emotional. “Enhancing image among peers”, one of the emotional goals, represented the others-oriented dimension of Holbrook’s typology (Holbrook 1994). Another emotional goal, appreciation of others’ expertise, represents the reactive value dimension. The coexistence of cognitive and emotional goals as dominant end states in the maps of both groups provides some evidence that overall cognitive structure may not be a simple addition of individual ladders but may actually be an interrelated net of associations, as suggested by Grunert and Grunert (1995).

Two Groups of Customers and Their Hierarchical Maps

The second research question posed was “Can quantitative research techniques be used to identify the differences between customer value hierarchies of experienced and inexperienced customers for the same service?”

This question could only be explored after the hypotheses testing revealed that the different factors of attributes, consequences and goals were, in fact, aligned in a hierarchical order. The application of importance and dominance analyses, respectively, in the presence of high multicollinearity, allowed the researcher to estimate the dominant variables in each factor and the dominant paths leading from lower levels to higher levels in the means-end chains.

This study is exploratory in the sense that it brings a completely new approach to understanding what students experience while they are practicing design, implementation and control of business strategies in a simulated business environment. This approach opened up new avenues for explaining why simulations are valuable experiential learning tools. The educational literature reports mixed results regarding the value of computer-based simulations as an educational tool (Chapman and Sorge 1999; Vaidyanathan and Rochford 1998), primarily due to the difficulty of correlating exam performance with simulation performance. This research constitutes a new approach for linking important features of a business simulation to customers' experiences.

Also, this study has helped to differentiate experts (executives) and novices (undergraduate students) in terms of their experiences of the simulation and the kinds of goals they achieved with the help of the simulation. Indeed, a review of the literature regarding the differences between experts and novices in information processing, knowledge acquisition, and decision making (Wu and

Lin 2006) suggests that a number of differences are likely. For instance, it is widely believed that experts are more capable of prioritizing and focusing on the core of the problem, as they are better at categorizing new problems and faster at retrieving relevant information (Day and Lord 1992). The literature also suggests that experts benefit more than novices from having a high degree of control on the flow of information in terms of deciding what information content to read, how long to read it, and in what order to read it (Ariely 2000). In contrast, Wu and Lin (2006) found that novices perform better in low information control conditions that are not as likely to overwhelm them. Finally, Spence and Brucks (1997) found that experts are more confident in their ability to make good decisions.

Keeping these differences between experts and novices in mind, one may conclude that both groups found the simulation experience valuable, but for different reasons. While they shared one common goal (intellectual gain), they differed drastically in other goals.

Both groups apparently felt that they had obtained an intellectual gain that far surpassed the effort they spent. However, the ways they achieved this goal were drastically different. While experts developed their persuasive communication skills by utilizing what they received from the simulation experience in the form of instructor input and realistic integration of all business functions, novices needed to develop their marketing, manufacturing and

leadership skills first.

As the literature suggests, the higher level executives (experts) appeared to focus on the core of the experience faster by selecting a smaller number of consequences and attributes among the many choices provided by the simulation. Their greater confidence, when combined with the successful completion of the simulation, may have enhanced their status among peers.

Novices, on the other hand, had to master multiple aspects of business decision-making and the business simulation itself in order to achieve higher intellectual gains. The simulation was valuable to novices, because it made them better business decision makers. Therefore, they appreciated the expertise of those who designed the simulation. This finding supports Holbrook's idea of reactive value, which is the appreciation or admiration of an object (simulation) and response to it as it acts upon and moves a person to a new dimension (Holbrook 1994).

These results raise another important question: "How can simulations successfully cater to the needs of vastly different groups of students which have different goals and levels of expertise?" The simulation is highly complex and different students work at different levels of complexity, just as chess players play at different levels of skill.

The research shows that decisions made by the novices are considerably less complex compared to decisions made by experts. Experts typically push the

simulation experience to higher and more complicated levels, learning in a shorter period of time and reaping the intellectual benefits that improve their reputation and credibility among peers. Novices, on the other hand, need more structured information flow and must spend more time making decisions. They definitely need the help of instructors and software teaching/practicing modules in order to achieve their goals. These results have important implications for future business simulations with novices and experts.

LIMITATIONS

The limitations of this study are as follows: First, only one specific service and two groups of customers were examined in a unique use situation. Theory suggests that as the use situation changes, customer value hierarchies' also change (Woodruff and Gardial 1996). Therefore, the results of this study cannot be generalized beyond the users of the simulation. From a pedagogical point of view, it would be desirable to replicate the study with other types of educational services such as case methodology, projects or lectures. In terms of a critical evaluation of the methodology, it needs to be tested with other types of services and products.

Second, the samples were drawn from only three business schools in the Southeast, Mid-Atlantic and Mid-West states. To extrapolate these findings to the

larger population of business students would require additional sampling across a wider spectrum of locations and business school types.

Third, it is unknown as to how similar the item pool that was used in this study would be to an item pool generated via the traditional laddering methodology. To the extent that the items are different, the results are likely to be different as well. A laddering study is needed in order to compare the important attributes, consequences, and end states that are discovered with each methodology.

Fourth, the hierarchies discovered via this quantitative method may or may not resemble the hierarchies discovered via the traditional laddering method. It is not possible to extrapolate from one methodology to the other without extensive comparative research. At best, the two methodologies represent different viewpoints on the same phenomenon. Perhaps the best understanding will come when the two tools are used in combination.

Finally, mean-end hierarchy researchers also mentioned the occurrence of improvisation during the laddering interview (Bagozzi and Dabholkar 2000; Gutman 1997). Respondents may develop chains that they had not thought about before, as questions may influence their construction of the cognitions. This type of spontaneity is not possible with a structured questionnaire. The respondents are limited to hierarchies that are implicit in the selection of the items included in the questionnaire.

FUTURE RESEARCH

Reflecting on this research in its entirety, the study achieved its goals of extending the body of knowledge regarding the measurement of customer value, means-end theory, and services marketing. There are, however, a number of research opportunities that should be pursued. To begin with, the limitations of this research suggest a starting point for future research. Specifically, there is a need to replicate the study in many more use situations. It would be especially desirable to conduct parallel studies employing both the quantitative and qualitative methods. Such studies would allow the direct comparison of the hierarchies obtained via the two methods in order to determine the degree of commonality and uniqueness of the two methods.

As a follow up to the current study, it would be valuable to conduct a laddering study and then use the attributes, consequences and outcomes that were discovered within it as the basis for a quantitative study. Both studies could then be compared against this study where the items were generated in a comprehensive but more typical survey methodology.

There is also a need to compare the hierarchies of competing services. In the current case, it would be interesting to compare the hierarchies of different pedagogies such as the case method and simulations. What are the paths taken by students as they presumably strive for intellectual gain? How similar or

different are the hierarchies? Do the resultant hierarchies support the traditional view of each method's contribution to management education?

The methods applied in this study may also prove themselves to be instrumental in formulating means-end hierarchies for other services and products in numerous use situations. This approach should complement qualitative techniques for exploring means-end hierarchies and estimating and measuring the creation of superior customer value (Slater 1997; Woodruff 1997).

The method to measure the dominant paths as introduced in this study not only may be used for cross-sectional studies, but also may be used for longitudinal studies. Longitudinal studies would be helpful in exploring how means-end hierarchies change from the first trial of the product or service to its continuous use. In other words, what is the desired value at the trial stage and what is its value after extended use? To be able to identify dominant paths quantitatively may help researchers to identify how the hierarchies evolve over time.

The ability of linking important attributes (means) to consequences and finally goals (ends) from the customers' point of view may also open up avenues for interesting studies in the domain of diffusion of innovations and new service development. For example, Rogers advocates that "relative advantage" is one of the important criteria that can speed up innovation adoption (Rogers 1995; Rogers and Singhal 1996). However, relative advantage is mostly described as

additional product features or attributes. Fisher and Schutta (2000) has suggested using the quality function deployment method to combine attributes and benefits in developing new services. However, they did not offer their interpretation of the meaning of benefits or the ways or their relationships to specific attributes. This quantitative method may shed some light on which attributes and benefits are relevant and how they are linked together. This application provides another incidence that linking goals, consequences and attributes might be especially important in the new service/product development area.

The method used in this dissertation may also be instrumental in estimating the likelihood of adoption of one product or service over an alternative product or service. The adoption decision of customers may be influenced by how much each product or service is perceived to contribute to the achievement of goals for customers. As a result, new product or service development efforts should focus on the most influential attributes for their target markets.

SUMMARY

This dissertation research yields important findings and conclusions regarding a test of the means-end theory in a specific use situation. It also suggests a way to quantitatively estimate dominant paths in a means-end

hierarchy for an educational service. Most importantly, all of the proposed hypotheses were supported. Thus, the research adds support to the existence of a hierarchical structure regarding the cognitions of customers as they relate to the attributes, consequences, and goals associated with the consumption of a service.

As a result, this research lays the foundation for an ongoing program of research focusing on the voice of the customer and the interrelationships between customers' goals and experiences and the design of services and products. This study illustrates how the means-end hierarchy may be utilized for a better understanding of delivery of customer value in products and services. This perspective may not only hold promise for further scholarly research in the above mentioned areas, but also provide guidance to marketing managers who want to better understand their customers' experiences as they use products and services. Ultimately, it is this researcher's sincere desire that the resulting insights will be useful in designing product features or service options that provide superior value to customers.

LIST OF REFERENCES

Affisco, John F. (2000), "My Experiences with Simulation/Gaming - 5 Years Further Down the Road," *Simulation and Gaming*, 31 (1 (March)), 42-47.

Aish, A. M. and K. G. Joreskog (1990), "A Panel Model of Political Efficacy and Responsiveness: An Application of LISREL 7 with Weighted Least Squares," *Quality and Quantity*, 24 (4), 405-26.

Anderson, J.C. and D.W. Gerbing (1988), "Structural Equation Modeling in Practice: A Review and Recommended Two-step Approach," *Psychological Bulletin*, 103 (411-423).

Anderson, James C. and David W. Gerbing (1982), "Some Methods for Respecifying Measurement Models to Obtain Unidimensional Construct Measurement," *Journal of Marketing Research*, XIX (November), 453-60.

Andreasen, Alan R. (1962), "Automated Grocery Shopping," *Journal of Marketing* (October), 64-66.

Anitsal, Ismet and M. Meral Anitsal (2004), "A Customer Value Hierarchy in Timeshare Holiday Resorts: Getting the Voice of the Customer Based on Quality Function Deployment Approach," in *Relational Marketing in an Information Age: Adapting Marketing Education and Practice in a Rapidly Changing World*, Jerry W. Wilson (Ed.) Vol. XX. Statesboro, Georgia: Atlantic Marketing Association.

Ariely, D. (2000), "Controlling the Information Flow: Effects on Consumers' Decision Making and Preferences," *Journal of Consumer Research*, 27, 233-48.

Armstrong, J. Scott and Terry S. Overton (1977), "Estimating Non-response Bias in Mail Surveys," *Journal of Marketing Research*, 14 (August), 396-402.

Aurifeille, Jacques-Marie and Pierre Valette-Florence (1995), "Determination of the Dominant Means-end Chains: A Constrained Clustering Approach," *International Journal of Research in Marketing*, 12, 267-78.

Azen, Razia and David V. Budescu (2003), "The Dominance Analysis Approach for Comparing Predictors in Multiple Regression," *Psychological Methods*, 8(2) (Jun), 129-48.

Bagozzi, Richard P. and Pratibha A. Dabholkar (1994), "Consumer Recycling Goals and Their Effect on Decision to Recycle: A Means-End Chain Analysis," *Psychology & Marketing*, 11(4) (July/August), 313-40.

---- (2000), "Discursive Psychology: An Alternative Conceptual Foundation to Means-End Chain Theory," *Psychology & Marketing*, 17 (7), 535-86.

Bagozzi, Richard P. and Utpal Dholakia (1999), "Goal Setting and Goal Striving in Consumer Behavior," *Journal of Marketing*, 63 (Special Issue), 19-32.

Bagozzi, Richard P. and Paul R. Warshaw (1990), "Trying to Consume," *Journal of Consumer Research*, 17 (September), 127-40.

Bagozzi, Richard P., Youjae Yi, and Lynn W. Phillips (1991), "Assessing Construct Validity in Organizational Research," *Administrative Science Quarterly*, 36 (3), 421-58.

Baker, Susan and Simon Knox (1995), "Mapping Consumer Cognitions in Europe," in *Marketing Today and for the 21st Century*, Michelle Bergadaa (Ed.) Vol. 2. Paris: EMAC Proceedings.

Baker, Susan, Keith E. Thompson, and Julia Engelken (2004), "Mapping the Values Driving Organic Food Choice: Germany vs the UK," *European Journal of Marketing*, 38 (8), 995-1012.

Baumann, M.A. (2001), "Timeshare Development: Branding Changes the Timeshare Playing Field," in *Hotel and Motel Management*.

Bitner, Mary Jo (2000), "The Servicescape," in *Handbook of Services Marketing & Management*, Teresa A. Swartz and Dawn Iacobucci, Eds. Thousand Oaks, California: Sage Publications, Inc.

Blank, Dennis (2003), "Timeshare Future Looks Promising," in *Hotel and Motel Management*.

Botschen, Gunther and Andrea Hemetsberger (1998), "Diagnosing Means-End Structures to Determine the Degree of Potential Marketing Program Standardization," *Journal of Business Research*, 42, 151-59.

Botschen, Gunther, Eva M. Thelen, and Rik Pieters (1999), "Using Means-End Structures for Benefit Segmentation: An Application to Services," *European Journal of Marketing*, 33 (1/2), 38-58.

Budescu, David V. (1993), "Dominance Analysis: A New Approach to the Problem of Relative Importance of Predictors in Multiple Regression," *Psychological Bulletin*, 114(3) (Nov), 542-51.

Budescu, David V. and Razia Azen (2004), "Beyond Global Measures of Relative Importance: Some Insights from Dominance Analysis," *Organizational Research Methods*, 7(3) (Jul), 341-50.

Byrne, Barbara M. (2001), *Structural Equation Modeling with Amos: Basic Concepts, Applications, and Programming*. Mahwah, New Jersey: Lawrence Erlbaum Associates, Inc.

Cadotte, Ernest R. (1995), "Business Simulations: The Next Step in Management Training," in *Selections: The Magazine of the Graduate Management Admission Council* Vol. Selections.

Calder, Bobby J., Lynn W. Phillips, and Alice M. Tybout (1982), "The Concept of External Validity," *Journal of Consumer Research*, 9 (December), 240-44.

Caruana, Albert, Arthur H. Money, and Pierre R. Berthon (2000), "Service Quality and Satisfaction - the Moderating Role of Value," *European Journal of Marketing*, 34 (11/12), 1338-52.

Chapman, Kenneth J. and Christine L. Sorge (1999), "Can a Simulation Help Achieve Course Objectives? An Exploratory Study Investigating Differences Among Instructional Tools," *Journal of Education for Business*, 74 (March/ April), 225-30.

Churchill, Gilbert A. (1979), "A Paradigm for Developing Better Measures of Marketing Constructs," *Journal of Marketing Research*, XVI, 64-73.

Claeys, C., A. Swinnen, and P. Vanden Abeele (1995), "Consumers' Means-end Chains for "Think" and "Feel" Products," *International Journal of Research in Marketing*, 12, 193-208.

Cohen, J.B. (1979), *The Structure of Brand Attributes: Defining Attribute Dimensions for Planning and Evaluation*. Cambridge: Prentice-Hall.

Cook, Thomas D. and Donald T. Campbell (1979), *Validity*. Chicago: Rand McNally.

Cronin, J. Joseph, Michael K. Brady, and G. Tomas M. Hult (2000), "Assessing the Effects of Quality, Value, and Customer Satisfaction on Consumer Behavioral Intentions in Service Environments," *Journal of Retailing*, 76 (2), 193-218.

Cronin, J. Joseph Jr, Michael K. Brady, Richard R. Brand, Roscoe Jr Hightower, and Donald J Shemwell (1997), "A Cross-sectional Test of the Effect and Conceptualization of Service Value," *Journal of Services Marketing*, 11 (6), 375-91.

Day, David V. and Robert G. Lord (1992), "Expertise and Problem Categorization: The Role of Expert Processing in Organizational Sense-making," *Journal of Management Studies*, 29 (1 (January)), 35-47.

de Chernatony, Leslie, Fiona Harris, and Francesca Dall'Olmo Riley (2000), "Added Value: Its Nature, Roles and Sustainability," *European Journal of Marketing*, 34 (1/2), 39-56.

Dillman, Don A. (2000), *Mail and Internet Surveys: The Tailored Design Method* (Second ed.). New York: John Wiley & Sons, Inc.

Faria, A.J. and T. Rick Whitely (1990), "An Empirical Evaluation of the Pedagogical Value of Playing a Simulation Game in a Principles of Marketing Course," in *Association for Business Simulation and Experiential Learning Conference*. Wichita, Kansas.

Fisher, Caroline M. and James T. Schutta (2000), *Developing New Services: Incorporating the Voice of the Customer into Strategic Service Development*. Milwaukee, Wisconsin: Sage Publications, ASQ Quality Press.

Flint, Daniel J., Robert B. Woodruff, and Sarah Fisher Gardial (2002), "Exploring the Phenomenon of Customers' Desired Value Change in a Business-to-Business Context," *Journal of Marketing*, 66, 102-17.

Flora, June A., Darius Jatilus, Chris Jackson, and Stephen Fortmann (1993), "The Stanford Five-City Heart Disease Prevention Project," in *Organizational Aspects of Health Communication Campaigns: What Works?*, Thomas E. Becker and Everett M. Rogers, Eds. Newbury Park, CA: Sage.

Frankel, Martin (1983), "Sampling Theory," in *Handbook of Survey Research*, Wright and Anderson Rossi, Ed. New York: Academic Press.

Garver, Michael S. and John T. Mentzer (1999), "Logistic Research Methods: Employing Structural Equation Modeling to Test for Construct Validity," *Journal of Business Logistics*, 20 (1), 33-57.

Gengler, Charles E., David B. Klenosky, and Michael S. Mulvey (1995), "Improving the Graphic Representation of Means-end Results," *International Journal of Research in Marketing*, 12, 245-56.

Goldman, Keren D. (1992), "Perceptions of a Health Education Innovation as Predictors of Implementation: The March of Dimes Campaign for Healthier Babies," New York University Press.

Gopinath, C. and John E. Sawyer (1999), "Exploring the Learning from an Enterprise Simulation," *Journal of Management Development*, 18 (5), 477-89.

Greenlaw, Paul S. and F. Paul Wyman (1973), "The Teaching Effectiveness of Games in Collegiate Business Courses," *Simulation and Games*, 4 (3), 259-94.

Griffin, Abbie, Paul Belliveau, Stephen Markham, Edward McDonough III, David Olson, and Albert Page (1997), "Drivers of NPD Success: The 1997 PDMA Report." Chicago, IL: Product Development and Management Association.

Gronroos, C. (1997), "Value -driven Relational Marketing: from Products to Resources and Competencies," *Journal of Marketing Management*, 13, 407-19.

Gronroos, Christian (2000), "Managing Service Productivity," in *Service Management and Marketing: A Customer Relationship Management Approach*. Second ed. Hanken, Sweden: John Wiley and Sons Ltd.

Grunert, Klaus G. and Suzanne C. Grunert (1995), "Measuring Subjective Meaning Structures by Laddering Method: Theoretical Considerations and Methodological Problems," *International Journal of Research in Marketing*, 12, 209-25.

Gutman, Jonathan (1991), "Exploring the Nature of Linkages Between Consequences and Values," *Journal of Business Research*, 22, 143-48.

---- (1982), "A Means-End Chain Model Based on Consumer Categorization Processes," *Journal of Marketing*, 46, 60-72.

---- (1997), "Means-End Chains and Goal Hierarchies," *Psychology and Marketing*, 14 (6), 545-60.

Harrison-Walker, L. Jean (2000), "A Comprehensive Pedagogy for Dialectic Team-Based Marketing Management Case Analysis," *The Journal of Education for Business*, 75 (4), 241-45.

Herrmann, Andreas and Frank Huber (2000), "Value-oriented Brand Positioning," *The International Review of Retail, Distribution and Consumer Research*, 10 (1 (January)), 95-112.

Holbrook, Morris B. (1999), *Consumer Value: A Framework for Analysis and Research*. London and New York: Routledge.

---- (1994), "The Nature of Customer Value," in *Service Quality: New Directions in Theory and Practice*, R. Rust and Oliver (Ed.). Thousand Oaks, California: Sage Publications.

Holbrook, Morris B. and Elizabeth C. Hirschman (1982), "The Experiential Aspects of Consumption: Consumer Fantasies, Feelings and Fun," *Journal of Consumer Research*, 9 (September), 132-40.

Holt, Douglas B. (1997), "Poststructuralist Lifestyle Analysis: Conceptualizing the Social Patterning of Consumption," *Journal of Consumer Research*, 23 (March), 326-50.

Howard, J.A. (1977), *Consumer Behavior: Application and Theory*. New York: Prentice-Hall.

Huber, Frank, Suzanne C. Beckmann, and Andreas Herrmann (2004), "Means-End Analysis: Does the Affective State Influence Information Processing Style?," *Psychology and Marketing*, 21 (9), 715.

Huffman, Cynthia and Michael J. Houston (1993), "Goal-oriented Experiences and the Development of Knowledge," *Journal of Consumer Research*, 20 (September), 190-207.

Jensen, Hans Rask (2001), "Antecedents and Consequences of Consumer Value Assessments: Implications for Marketing Strategy and Future Research," *Retailing and Consumer Services*, 8, 299-310.

Johnson, Jeff W. (2004), "Factors Affecting Relative Weights: The Influence of Sampling and Measurement Error," *Organizational Research Methods*, 7(3) (Jul), 283-99.

---- (2000), "A Heuristic Method for Estimating the Relative Weight of Predictor Variables in Multiple Regression," *Multivariate Behavioral Research*, 35(1), 1-19.

Johnson, Jeff W. and James M. LeBreton (2004), "History and Use of Relative Importance Indices in Organizational Research," *Organizational Research Methods*, 7 (3) (Jul), 238-57.

Johnson, Michael D. (1984), "Consumer Choice Strategies for Comparing Noncomparable Alternatives," *Journal of Consumer Research*, 11 (December), 741-53.

Johnson, Susan P., Larry J. Menor, Aleda V. Roth, and Richard B. Chase (2000), "A Critical Evaluation of the New Service Development Process," in *New Service Development: Creating Memorable Experiences*, James A. Fitzsimmons and Mona J. Fitzsimmons, Eds. Thousand Oaks, California: Sage Publications, Inc.

Johnston, Charles (1995), "The Rokeach Value Survey: Underlying Structures and Multi-dimensional Scaling," *Journal of Psychology*, 129 (September), 583-97.

Kahle, Lynn R., Sharon E. Beatty, and Pamela Homer (1986), "Alternative Measurement Approaches to Consumer Values: The List of Values and Life Style (VALS)," *Journal of Consumer Research*, 13 (December), 404-09.

Kamakura, Wagner A. and Jose Afonso Mezzon (1991), "Value Segmentation: A Model for the Measurement of Values and Value Systems," *Journal of Consumer Research*, 18 (September), 208-18.

Kamakura, Wagner A. and Thomas P. Novak (1992), "Value System Segmentation: Exploring the Meaning of LOV," *Journal of Consumer Research*, 19 (June), 119-32.

Keys, Bernard (1976), "A Review of Learning Research in Business Gaming," in *Third Annual Conference of the Association for Business Simulation and Experiential Learning Vol. 3*.

Keys, Bernard and Joseph Wolfe (1990), "The Role of Management Games and Simulations in Education and Research," *Journal of Management*, 16 (2), 307-36.

Kotler, Phillip (2000), *Marketing Management (The Millennium Edition ed.)*. Upper Saddle River, New Jersey: Prentice Hall.

Kumar, A. and W. R. Dillon (1987), "Some Further Remarks on Measurement-Structure Interaction and the Unidimensionality of Components," *Journal of Marketing Research*, 24, 438-44.

Landy, Frank J. and Wendy S. Becker (1987), "Motivation Theory Reconsidered," *Research in Organizational Behavior*, 9, 1-38.

Leclerc, France and Bernd H. Schmitt (1999), "The Value Of Time in the Context of Waiting and Delays," in *Consumer Value: A Framework for Analysis and Research*, Morris B. Holbrook, Ed. New York, NY: Routledge.

Leeds, Michael, William Stull, and Jilleen Westbrook (1998), "Do Changes in Classroom Techniques Matter? Teaching Strategies and Their Effects on Teaching Evaluations," *Journal of Education for Business* (November/December), 75-78.

Lin, Chin-Feng (2002), "Attribute-Consequence-Value Linkages: A New Technique for Understanding Customers' Product Knowledge," *Journal of Targeting, Measurement and Analysis for Marketing*, 10 (4), 339-52.

Lovelock, Christopher H. and Jochen Wirtz (2004), *Services Marketing: People, Technology, Strategy* (5th Edition ed.). Upper Saddle River, New Jersey: Pearson, Prentice Hall.

Marketing Science Institute (2002), "2002-2004 Research Priorities - A Guide to MSI Research Programs and Procedures." Cambridge, MA: Marketing Science Institute.

Marsh, Herbert W. (1994), "Confirmatory Factor Analysis models of Factorial Invariance: A Multifaceted Approach," *Structural Equation Modeling*, 1 (1), 5-34.

Mathwick, Charla, Naresh Malhotra, and Edward Rigdon (2001), "Experiential Value: Conceptualization, Measurement and Application in the Catalog and Internet Shopping Environment," *Journal of Retailing*, 77, 39-56.

McGrath, Joseph E. and David Brinberg (1983), "External Validity and the Research Process: A Comment on the Calder/Lynch Dialogue," *Journal of Consumer Research*, 10 (June), 115-24.

Mentzer, John T. and Daniel J. Flint (1997), "Validity in Logistics Research," *Journal of Business Logistics*, 18 (1), 199-216.

Michlitsch, Joseph F. and Meg Wrigth Sidle (2002), "Assessing Student learning Outcomes: A Comparative Study of Techniques Used in Business School Disciplines," *Journal of Education for Business* (January/February), 125-30.

Mitchell, Rex C. (2004), "Combining Cases and Computer Simulations in Strategic Management Courses," *Journal of Education for Business* (March/April), 198-204.

Moore, Gary C. and Izak Benbasat (1991), "Development of an Instrument to Measure the Perceived Characteristics of Adopting an Information Technology Innovation," *Information System Research*, 11, 192-220.

Myers, James H. and A.D. Shocker (1980), *The Nature of Brand Related Attributes*. Chicago: Free Press.

Neter, John, Michael Kutner, Christopher Nachtsheim, and William Wasserman (1996), *Applied Linear Statistical Models* (Fourth ed.): Irwin.

Olson, Jerry C. and Thomas J. Reynolds (1983), "Understanding Consumers' Cognitive Structures: Implications for Advertising Strategy," in *Advertising and Consumer Psychology*, Larry Percy and Arch G. Woodside, Eds. Lexington, Massachusetts: Lexington Books, D.C. Heath and Company.

Parasuraman, A. (1997), "Reflections on Gaining Competitive Advantage Through Customer Value," *Journal of the Academy of Marketing Science*, 25 (2), 154-61.

Parasuraman, A., V. Zeithaml, and L.L. Berry (1985), "A Conceptual Model of Service Quality and Its Implications for Future Research," *Journal of Marketing*, 49 (Autumn), 41-50.

---- (1988), "SERVQUAL: A Multiple-item Scale for Measuring Consumer Perceptions of Service Quality," *Journal of Retailing*, 64 (Spring), 12-40.

Pieters, Rik, Hans Baumgartner, and Doug Allen (1995), "A Means-end Chain Approach to Customer Goal Structures," *International Journal of Research in Marketing*, 12, 227-44.

Reynolds, Thomas J., Charles E. Gengler, and Daniel J. Howard (1995), "A Means-end Analysis of Brand Persuasion Through Advertising," *International Journal of Research in Marketing*, 12, 257-66.

Reynolds, Thomas J. and Jonathan Gutman (1988), "Laddering Theory, Method, Analysis, and Interpretation," *Journal of Advertising Research* (February/March), 11-31.

Richins, Marsha (1999), "Possessions, Materialism, and Other-Directedness in the Expression of Self," in *Consumer Value: A Framework for Analysis and Research*, Morris B. Holbrook, Ed. London: Routledge.

---- (1994), "Valuing Things: The Public and Private Meanings of Possessions," *Journal of Consumer Research*, 21 (December), 504-21.

Rigdon, Edward E. (1996), "CFI versus RMSEA: A Comparison of Two Fit Indexes for Structural Equation Modeling," *Structural Equation Modeling*, 3 (4), 369-79.

Rogers, Everett (1995), *Diffusion of Innovations*. New York: The Free Press.

Rogers, Everett and Arvind Singhal (1996), "Diffusion of Innovations," in *An Integrated Approach to Communication Theory and Research*, Michael B. Salwen and Don W. Stacks, Ed. Mahwah, New Jersey: Lawrence Erlbaum Associates.

Rokeach, Milton (1973), *The Nature of Human Values*. New York, New York: The Free Press - A Division of Macmillan Publishing Co., Inc.

Rosenberg, M. (1956), "Cognitive Structure and Attitudinal Effect," *Journal of Abnormal and Social Psychology*, 53, 367-72.

Rust, Ronald T. and Richard L. Oliver (1994), *Service Quality: New Directions in Theory and Practice*. Thousand Oaks, CA: Sage.

Saliba, Michael T. and Caroline M. Fisher (2000), "Managing Customer Value," *Quality Progress* (June), 63-69.

Schiffman, Leon G. and Leslie Lazar Kanuk (2000), *Consumer Behavior* (Seventh ed.). Upper Saddle River, New Jersey: Prentice Hall.

Sinha, Indrajit and Wayne S. DeSarbo (1998), "An Integrated Approach Toward the Spatial Modeling of Perceived Customer Value," *Journal of Marketing Research*, 35 (May), 236-49.

Slater, S.F. and J.C. Narver (2000), "Intelligence Generation and Superior Customer Value," *Journal of the Academy of Marketing Science*, 28 (Winter), 120-27.

Slater, Stanley F. (1997), "Developing a Customer Value-Based Theory of the Firm," *Journal of the Academy of Marketing Science*, 25 (2), 162-67.

Solomon, Michael R. (1999), "The Value of Status and the Status of Value," in *Consumer Value: A Framework for Analysis and Research*, Morris B. Holbrook, Ed. London: Routledge.

Spence, Mark T. and Merrie Brucks (1997), "The Moderating Effects of Problem Characteristics on Experts' and Novices' Judgements," *Journal of Marketing Research*, XXXIV (May), 233-47.

Steenkamp, Jan-Benedict E.M. and Hans C.M. van Trijp (1991), "The Use of LISREL in Validating Marketing Constructs," *International Journal of Research in Marketing*, 8, 283-99.

Stonham, Paul (1995), "For and Against the Case Method," *European Management Journal*, 13 (2 (June)), 230-32.

ter Hofstede, Frenkel, Anke Audenaert, Jan-Benedict E.M. Steenkamp, and Michel Wedel (1998), "An investigation into the Association Pattern Technique as a Quantitative Approach to Measuring Means-end Chains," *International Journal of Research in Marketing*, 15, 37-50.

Terrill, Craig and Arthur Middlebrooks (2000), *Market Leadership Strategies for Service Companies: Creating Growth, Profits, and Customer Loyalty*. Chicago, Illinois: NTC Business Books.

Thompson, Craig J. and Maura Troester (2002), "Consumer Value Systems in the Age of Postmodern Fragmentation: The Case of the Natural Health Microculture," *Journal of Consumer Research*, 28 (March), 550-71.

Tornatzky, Louis G. and Katherine J. Klein (1982), "Innovation Characteristics and Adoption-Implementation: A Meta-Analysis of Findings," *IEEE Transactions on Engineering Management*, EM-29 (1), 28-45.

Ueltschy, Linda C. (2001), "An Exploratory Study of Integrating Interactive Technology into the Marketing Curriculum," *Journal of Marketing Education*, 23 (1), 63-72.

Ueltschy, Linda C. and Robert F. Krampf (2001), "Cultural Sensitivity to Satisfaction and Service Quality Measures," *Journal of Marketing Theory and Practice*, Summer, 14-31.

Urban, Glen L. and John R. Hauser (1993), *Design and Marketing of New Products* (2nd Edition ed.). Upper Saddle River, New Jersey: Prentice-Hall, Inc.

Vaidyanathan, Rajiv and Linda Rochford (1998), "An Exploratory investigation of Computer Simulations, Student Preferences, and Performance," *Journal of Education for Business*, 73 (3 (Jan/Feb)), 144-50.

Valette-Florence, Pierre (1998), "A Causal Analysis of Means-End Hierarchies in a Cross-Cultural Context: Methodological Refinements," *Journal of Business Research*, 42, 161-66.

Valette-Florence, Pierre and Bernard Rapacchi (1991), "Improvements in Means-End Chain Analysis: Using Graph Theory and Correspondence Analysis," *Journal of Advertising Research* (February/March), 30-45.

Vandermerwe, Sandra (2000), "How Increasing Value to Customers Improves Business Results," *Sloan Management Review* (Fall), 27-37.

Wagner, Janet (1999), "Aesthetic Value," in *Consumer value: A Framework for Analysis and Research*, Morris B. Holbrook, Ed. New York, NY: Routledge.

Walker, Beth and Jerry C. Olson (1991), "Means-End Chains: Connecting Product with Self," *Journal of Business Research*, 22, 111-18.

Walters, Bruce A. and Abdul M. A. Rashed (1997), "Simulation Games in Business Policy Courses: Is There Value for Students?," *Journal of Education for Business*, 72 (3 (Jan/Feb)), 170-75.

Woodruff, Robert B. (1997), "Customer Value: The Next Source for Competitive Advantage," *Journal of the Academy of Marketing Science*, 25 (2), 139-53.

Woodruff, Robert B. and Sarah F. Gardial (1996), *Know Your Customer: New Approaches to Understanding Customer Value and Satisfaction*. Malden, Massachusetts: Blackwell Publishers Inc.

Wu, Ling-Ling and Jia-Yan Lin (2006), "The Quality of Consumers' Decision-Making in the Environment of E-commerce," *Psychology & Marketing*, 23 (4), 297-311.

Young, S. and B. Feigin (1975), "How Advertising Works: A Planning Model Revisited," *Journal of Advertising Research*, 26, 57-66.

Zeithaml, V. (1988), "Consumer Perceptions of Price, Quality, and Value: A Means-End Model and Synthesis of Evidence," *Journal of Marketing*, 52 (July), 2-22.

Zeithaml, Valarie A., Mary Jo Bitner, and Dwayne D. Gremler (2006), *Services Marketing: Integrating Customer Focus Across the Firm* (Fourth ed.). New York, NY: McGraw-Hill Irwin.

Zeithaml, Valarie A., A. Parasuraman, and L.L. Berry (1985), "Problems and Strategies in Services Marketing," *Journal of Marketing*, 49 (Spring), 33-46.

APPENDICES

APPENDIX A: Pre-Test Items

List of Attribute Items of the Pre-test

- 1 The appropriate credit hours for this course
- 2 The new venture storyline within the software helped to hold together the flow of the simulation.
- 3 The new venture situation and the gradual introduction of new decisions and information made it easier to absorb the whole complexity of the simulated business.
- 4 The software helped to organize the work in a logical fashion.
- 5 The step-by-step approach of the simulation reduced my anxiety and confusion.
- 6 My team was given relevant information (e.g., market data, operational statistics, and/or profit analysis) before we had to make any decision.
- 7 Within the narrative story line and help files, my team was provided with the issues, conflicts, constraints and tradeoffs to consider at important decision points in the exercise.
- 8 The Balanced Scorecard emphasized the importance of taking a balanced perspective when managing a firm.
- 9 The Balanced Scorecard was a good measure of a team's ability to effectively manage the resources of the firm.
- 10 I felt that I could turn to my instructor/coach for support and advice.
- 11 I felt comfortable knowing that there was a technical support system.
- 12 My instructor was very knowledgeable about the Marketplace simulation.
- 13 My instructor went well beyond the norm in coaching the entire class to have a good learning experience.

List of Consequence Items of the Pre-test

The MPS has helped you to accomplish the followings:

- 14 Develop teamwork skills.
- 15 Learn how to use the tools of management (profitability analysis, manufacturing reports, and market reports) in managing the firm.
- 16 Help your learning of important business concepts, principles and ways of thinking.
- 17 Develop strategic planning and execution skills within a rapidly changing environment.
- 18 Develop a thought process that you can carry into the real world.
- 19 Instill a bottom line focus and the simultaneous need to deliver customer value.
- 20 Crystallize the financial implications of business decisions by linking them to cash flows and bottom-line performance.
- 21 Learn to adjust strategy and tactics in response to financial performance, competitive tactics, and customer needs.
- 22 Help you to see how the business world might react to your decisions and the decisions of your competitors.
- 23 Help you to see how your decisions can affect the performance of others and the organization as a whole.
- 24 Test your ability to react to market feedback in an environment where a misstep could result in lost market share and/or profits.
- 25 Excite your competitive spirit.
- 26 Excite your drive to excel in the market.

List of Consequence Items of the Pre-test (Continued)

I learned,

- 27 how competition will speed up the rate of change and make the marketplace very volatile.
- 28 how to respond quickly to changing conditions in the marketplace.
- 29 a great deal about responding to unforeseen circumstances in a business environment.
- 30 how to use information to make better decisions.
- 31 how to work outside of the box or outside of my comfort zone.
- 32 how to utilize team dynamics to improve business decisions.
- 33 how important it is to discover and exploit the market's many response functions.
- 34 how important it is to use market data and competitive signals to adjust the strategic plan and more tightly focus our business tactics.

List of Holbrook's Customer Value Dimensions and Corresponding Goal Items of the Pre-Test

VALUE CATEGORIES		GOALS
<u>Self-Oriented</u>	Ego	55. The Marketplace exercise has helped me to feel good about myself. 47. The Marketplace exercise has helped me to build my confidence in business decision making through knowledge and experience. 45. The Marketplace experience was helpful to me in the development of my confidence to make business decisions
	Self-actualization	35. The Marketplace experience was helpful to me in the development of my leadership skills 46. The Marketplace experience was helpful to me in the development of my comfort in entering the workforce after graduation 51. The Marketplace exercise has helped me to discover my style of doing things. 52. The Marketplace experience has helped me to realize that I can succeed in business.
<u>Others-oriented</u>	Esteem	36. The Marketplace experience was helpful to me in the development of my teamwork skills 43. The Marketplace experience was helpful to me in the development of my persuasive communication skills 54. The Marketplace experience has helped me to show others that I have a great deal of ability and talent in the business field.
	Status	53. The Marketplace exercise has helped me to improve my image among my peers. 50. The Marketplace exercise has helped me to go into the business world and work with business people. 49. The Marketplace exercise has helped me to better understand the language and thought processes of business managers and executives.

List of Holbrook's Customer Value Dimensions and Corresponding Goal Items of the Pre-Test

VALUE CATEGORIES		GOALS
<u>Active</u>	Expertise	The Marketplace experience was helpful to me in the development of my: 37. Marketing skills 38. Manufacturing skills 39. Financial skills 40. Accounting skills 41. Human resource management skills 42. e-Commerce skills 44. Overall understanding of business
	Control	48. The Marketplace exercise has helped me to develop critical thinking skills. 68. I feel that I have personally accomplished a great deal. 69. I felt like I was in control of my personal growth during the Marketplace exercise.
<u>Reactive</u>	Appreciation	62. I appreciated the expertise of those who designed the exercise for me. 64. The Marketplace simulation will add to the prestige of the undergraduate program. 63. I appreciate the work done by my instructor/coach to help me benefit as much as possible by this exercise.
	Dependence	10. I felt that I could turn to my teaching assistant for support and advice. 11. I felt comfortable knowing that there was a technical support system.
<u>Extrinsic</u>	Input/Output	70. The benefits to me were worth the time I have invested in the exercise. 71. The Marketplace experience was well worth the money I paid to participate. 72. My intellectual gain far surpassed the effort I invested in Marketplace.

List of Holbrook's Customer Value Dimensions and Corresponding Goal Items of the Pre-Test

VALUE CATEGORIES		GOALS
<u>Intrinsic</u>	Fun & Play	65. I had fun competing in the Marketplace simulation. 66. I felt like giving a present to myself at the end of the Marketplace experience. 67. I felt refreshed and excited while I participated in Marketplace.

List of Intention Items of the Pre-test

- 73 I will recommend this program to other students.
- 74 During job interviews, I will talk about my simulation experience to prospective employers.
- 75 I will include the materials I created in Marketplace in my business portfolio to illustrate my achievements during job interviews.
- 76 I expect to be able to use the lessons learned in this course later in my career.
- 77 I will recommend that the College continue to offer this course in the undergraduate curriculum every semester.
- 78 I will use the Marketplace simulation as a yardstick to measure other courses in terms of their enrichment of my learning.

APPENDIX B: Main Study Items

List of Attribute items of the Main Study

ATTRIBUTES – Design Elements

- 2 The simulation was well organized.
- 3 The thought process underlying the simulation was understandable.
- 4 The explanations regarding the work to be done in the simulation were easy to follow.
- 5 The business situations presented in the simulation were reflective of the real world.
- 6 There was enough time to think through the problems presented in the simulation.
- 7 My instructor provided individualized attention throughout the simulation.
- 8 My instructor was knowledgeable about the details of the simulation.
- 9 My instructor provided timely feedback about how well we performed.
- 10 My instructor was helpful in explaining the issues that had to be addressed in the simulation.
- 11 My instructor was very good in coaching me/my team.
- 12 My instructor was very enthusiastic about using the simulation in this course.
- 13 My instructor went well beyond the norm in helping the entire class have a good learning experience.
- 14 My instructor helped us to realize the important learning points of the simulation.

ATTRIBUTES – Reality of Situations

- 15 Finance
- 16 Marketing
- 17 Human Resources
- 18 Operations / Manufacturing
- 19 Accounting
- 20 Sales and promotions
- 21 Distribution
- 22 Integration of all business functions
- 23 International issues
- 24 Strategic planning
- 25 Tactical execution of strategy

List of Consequence Items of the Main Study

CONSEQUENCES

Simulation has helped you to accomplish the following:

- 26 Learn how to use the tools of management in managing the firm.
- 27 Help your learning of important business concepts, principles, and ways of thinking.
- 28 Develop strategic planning and execution skills within a rapidly changing environment.
- 29 Develop a thought process that you can carry into the real world.
- 30 Instill a bottom line focus and the simultaneous need to deliver customer value.
- 31 Crystallize the financial implications of business decisions by linking them to cash flows and bottom-line performance.
- 32 Learn to adjust strategy and tactics in response to financial performance, competitive tactics, and customer needs.
- 33 Help you to see how the business world might react to your decisions and the decisions of your competitors.
- 34 Help you to see how your decisions can affect the performance of others and the organization as a whole.
- 35 Test your ability to react to market feedback in an environment where a misstep could result in lost market share and/or profits.
- 36 Excite your competitive spirit.
- 37 Excite your drive to excel in the market.

You learned the following lessons from your participation in the simulation:

- 38 how competition will speed up the rate of change and make the market place very volatile.
- 39 how to respond quickly to changing conditions in the market place.
- 40 a great deal about responding to unforeseen circumstances in a business environment.
- 41 how to use information to make better decisions.
- 42 how to work outside of the box or outside of my comfort zone.
- 43 how to utilize team dynamics to improve business decisions.
- 44 how important it is to discover and exploit the market's many response functions.
- 45 how important it is to use market data and competitive signals to adjust the strategic plan and more tightly focus our business tactics.

List of Skill Development Items of the Main Study

SKILL DEVELOPMENT

The simulation experience was helpful to me in the development of my:

46 Leadership skills

47 Teamwork skills

48 Marketing skills

49 Manufacturing skills

50 Financial skills

51 Accounting skills

52 Human resource management skills

53 e-Commerce skills

54 Persuasive communication skills

List of Goal Items of the Main Study

GOALS

The simulation experience was helpful to me in the development of my: / The simulation method has helped me to:

55	Overall understanding of business
56	Confidence to make business decisions
57	Comfort in entering the workforce after graduation
58	build my confidence in business decision making through knowledge and experience.
59	develop my critical thinking skills.
60	better understand the language and thought processes of business managers and executives.
61	go into the business world and work with business people.
62	discover my style of doing things.
63	realize that I can succeed in business.
64	improve my image among my peers.
65	show others that I have a great deal of ability and talent in the business field.
66	feel good about myself.
73	I appreciate the expertise of those who designed the simulation for me.
74	I appreciate the work done by my instructor/coach to help me benefit as much as possible by this experience.
75	The use of simulation will add to the prestige of the undergraduate program.
76	I had fun in competing in the simulation.
77	I felt like giving myself a present at the end of the simulation experience.
78	I felt refreshed and excited while I participated in the simulation.
79	I feel that I have personally accomplished a great deal.
80	I felt like I was in control of my personal growth during the simulation exercises.
81	The benefits to me were worth the time I have invested in the simulation.
82	The simulation experience was well worth the money I paid for the materials.
83	My intellectual gain far surpassed the effort I invested in the simulation.

List of Intention Items of the Main Study

FUTURE INTENTIONS

- 84 I will recommend this program to other students.
- 85 During job interviews, I will talk about my simulation experience to prospective employers.
- 86 I will include the materials I created for the simulation in my business portfolio to illustrate my achievements during job interviews.
- 87 I expect to be able to use the lessons learned in this course later in my career.
- 88 I will recommend that the College continue to offer this course in the undergraduate curriculum every semester.
- 89 I will use the simulation exercise as a yardstick to measure other courses in terms of their enrichment of my learning.

APPENDIX C: Main Study Correlation matrix

Pearson Correlations Section (Row-Wise Deletion)

	Q2	Q3	Q4	Q5	Q6	Q7
Q2	1.000000	0.674308	0.636981	0.529578	0.416292	0.522198
Q3	0.674308	1.000000	0.679494	0.596789	0.472325	0.509378
Q4	0.636981	0.679494	1.000000	0.531708	0.513542	0.543366
Q5	0.529578	0.596789	0.531708	1.000000	0.489869	0.435958
Q6	0.416292	0.472325	0.513542	0.489869	1.000000	0.420607
Q7	0.522198	0.509378	0.543366	0.435958	0.420607	1.000000
Q8	0.588043	0.566775	0.551480	0.452543	0.358494	0.748536
Q9	0.555349	0.518168	0.523878	0.428428	0.355144	0.719184
Q10	0.570571	0.566338	0.576112	0.480868	0.409297	0.768944
Q11	0.508353	0.495450	0.528871	0.442797	0.371645	0.783701
Q12	0.539327	0.507108	0.494039	0.424547	0.311466	0.668816
Q13	0.533685	0.523522	0.542447	0.452819	0.365224	0.759979
Q14	0.571854	0.573970	0.578827	0.504423	0.377791	0.715025
Q15	0.273212	0.305584	0.323360	0.331961	0.210410	0.291607
Q16	0.368893	0.354021	0.299203	0.430559	0.302051	0.283791
Q17	0.275619	0.285087	0.305969	0.403113	0.274258	0.275947
Q18	0.315633	0.321211	0.329963	0.436948	0.302542	0.304204
Q19	0.315458	0.316676	0.370907	0.335954	0.259140	0.337011
Q20	0.308611	0.333662	0.326423	0.457923	0.335002	0.275669
Q21	0.276281	0.276946	0.338952	0.372081	0.297026	0.266423
Q22	0.356835	0.411876	0.412586	0.488814	0.324126	0.332882
Q23	0.303824	0.294212	0.349467	0.349542	0.311471	0.313827
Q24	0.334236	0.406998	0.379831	0.413777	0.310513	0.286409
Q25	0.374950	0.442695	0.435978	0.482716	0.347899	0.337155
Q26	0.428751	0.439242	0.439585	0.480427	0.389685	0.443931
Q27	0.417963	0.457675	0.448505	0.509356	0.355437	0.395160
Q28	0.427937	0.470145	0.464737	0.511443	0.389542	0.399001
Q29	0.444911	0.461300	0.459312	0.558087	0.406007	0.415191
Q30	0.416882	0.427139	0.474516	0.477697	0.355041	0.410642
Q31	0.399825	0.434322	0.438221	0.451497	0.326684	0.383710
Q32	0.424112	0.463779	0.468021	0.464137	0.371374	0.361144
Q33	0.381603	0.430525	0.429475	0.499942	0.364611	0.364118
Q34	0.393682	0.433108	0.440378	0.469702	0.328023	0.363691
Q35	0.416941	0.472416	0.463387	0.495754	0.382158	0.375628
Q36	0.382665	0.394169	0.396005	0.462761	0.366804	0.361170
Q37	0.393789	0.411396	0.410375	0.474262	0.374561	0.356720
Q38	0.413526	0.426906	0.432117	0.406718	0.326829	0.370611
Q39	0.413556	0.460940	0.431145	0.434052	0.363890	0.362899
Q40	0.378980	0.439635	0.449842	0.446649	0.391176	0.382361
Q41	0.433564	0.452772	0.428203	0.486864	0.323343	0.382585
Q42	0.330941	0.366970	0.402901	0.360905	0.312026	0.313724
Q43	0.349571	0.385968	0.377587	0.382337	0.325680	0.325863
Q44	0.416834	0.400964	0.433351	0.450415	0.341251	0.391368
Q45	0.440545	0.452104	0.437638	0.476178	0.361073	0.390775
Q46	0.321998	0.320986	0.301516	0.339135	0.316108	0.290685
Q47	0.314942	0.312391	0.279123	0.327153	0.305301	0.280437

Q48	0.348419	0.349071	0.372406	0.425325	0.334397	0.282716
Q49	0.287570	0.325529	0.371370	0.397781	0.353042	0.305602
Q50	0.326807	0.356713	0.377079	0.383225	0.307034	0.342105
Q51	0.320764	0.333934	0.381823	0.370704	0.317740	0.346711
Q52	0.311274	0.318585	0.338668	0.367515	0.329276	0.276175
Q53	0.303846	0.309732	0.290085	0.369198	0.307794	0.285270
Q54	0.291628	0.313522	0.299332	0.324901	0.312923	0.268511
	Q8	Q9	Q10	Q11	Q12	Q13
Q2	0.588043	0.555349	0.570571	0.508353	0.539327	0.533685
Q3	0.566775	0.518168	0.566338	0.495450	0.507108	0.523522
Q4	0.551480	0.523878	0.576112	0.528871	0.494039	0.542447
Q5	0.452543	0.428428	0.480868	0.442797	0.424547	0.452819
Q6	0.358494	0.355144	0.409297	0.371645	0.311466	0.365224
Q7	0.748536	0.719184	0.768944	0.783701	0.668816	0.759979
Q8	1.000000	0.796467	0.804335	0.761336	0.745985	0.765364
Q9	0.796467	1.000000	0.808912	0.758160	0.717344	0.755601
Q10	0.804335	0.808912	1.000000	0.815211	0.708943	0.779110
Q11	0.761336	0.758160	0.815211	1.000000	0.687960	0.810926
Q12	0.745985	0.717344	0.708943	0.687960	1.000000	0.773822
Q13	0.765364	0.755601	0.779110	0.810926	0.773822	1.000000
Q14	0.761261	0.742896	0.791454	0.769294	0.724462	0.815458
Q15	0.331403	0.296561	0.317264	0.309991	0.279032	0.312459
Q16	0.304491	0.283946	0.304528	0.288051	0.207764	0.274950
Q17	0.259120	0.249097	0.295527	0.278585	0.222804	0.294103
Q18	0.323681	0.292209	0.295209	0.307474	0.277881	0.295836
Q19	0.336494	0.314583	0.338639	0.335261	0.300251	0.352258
Q20	0.301156	0.265865	0.300850	0.306601	0.249548	0.305814
Q21	0.276639	0.244671	0.300951	0.304933	0.245149	0.298054
Q22	0.367933	0.357234	0.389807	0.358353	0.362077	0.382580
Q23	0.295690	0.291796	0.334519	0.332208	0.247551	0.338425
Q24	0.325603	0.293693	0.339088	0.308164	0.276901	0.345241
Q25	0.356388	0.326043	0.373867	0.341031	0.309578	0.364967
Q26	0.412015	0.386264	0.428997	0.445092	0.346343	0.435020
Q27	0.401104	0.376393	0.414492	0.419685	0.366315	0.409054
Q28	0.399360	0.384720	0.431165	0.403085	0.373800	0.423151
Q29	0.421184	0.403384	0.441670	0.436172	0.379615	0.442316
Q30	0.438022	0.411385	0.457800	0.411226	0.387964	0.438026
Q31	0.391785	0.353134	0.400245	0.366414	0.406066	0.416451
Q32	0.391086	0.377112	0.404967	0.346567	0.364051	0.381366
Q33	0.375589	0.366897	0.403914	0.362363	0.334574	0.365640
Q34	0.409903	0.399380	0.414356	0.377427	0.395801	0.400282
Q35	0.392013	0.372250	0.428604	0.375969	0.360600	0.393811
Q36	0.381137	0.360052	0.383672	0.364583	0.377226	0.397457
Q37	0.378488	0.366731	0.406230	0.372841	0.373640	0.390787
Q38	0.371670	0.331850	0.378151	0.366969	0.365662	0.379943
Q39	0.395533	0.356928	0.387479	0.378288	0.364076	0.396763
Q40	0.364834	0.364470	0.410042	0.370120	0.325833	0.391162
Q41	0.390829	0.392462	0.430989	0.385872	0.357715	0.383274
Q42	0.307529	0.315484	0.307033	0.314646	0.292327	0.332299
Q43	0.296925	0.324753	0.323986	0.349177	0.307310	0.344977

Q44	0.389625	0.361998	0.390093	0.380700	0.363793	0.399877
Q45	0.407208	0.393284	0.414202	0.378461	0.398702	0.420355
Q46	0.282367	0.269744	0.281352	0.291611	0.218218	0.284999
Q47	0.275624	0.296699	0.319152	0.303322	0.229780	0.277088
Q48	0.276830	0.252611	0.305611	0.309471	0.215427	0.300047
Q49	0.288605	0.264485	0.277600	0.303352	0.260133	0.306552
Q50	0.333698	0.291493	0.340399	0.341908	0.318496	0.372012
Q51	0.319538	0.288013	0.328903	0.342760	0.291875	0.358440
Q52	0.271072	0.262201	0.318801	0.312745	0.216967	0.285042
Q53	0.261492	0.276188	0.294983	0.292157	0.230799	0.305079
Q54	0.250178	0.273343	0.277495	0.269521	0.221118	0.289163
	Q14	Q15	Q16	Q17	Q18	Q19
Q2	0.571854	0.273212	0.368893	0.275619	0.315633	0.315458
Q3	0.573970	0.305584	0.354021	0.285087	0.321211	0.316676
Q4	0.578827	0.323360	0.299203	0.305969	0.329963	0.370907
Q5	0.504423	0.331961	0.430559	0.403113	0.436948	0.335954
Q6	0.377791	0.210410	0.302051	0.274258	0.302542	0.259140
Q7	0.715025	0.291607	0.283791	0.275947	0.304204	0.337011
Q8	0.761261	0.331403	0.304491	0.259120	0.323681	0.336494
Q9	0.742896	0.296561	0.283946	0.249097	0.292209	0.314583
Q10	0.791454	0.317264	0.304528	0.295527	0.295209	0.338639
Q11	0.769294	0.309991	0.288051	0.278585	0.307474	0.335261
Q12	0.724462	0.279032	0.207764	0.222804	0.277881	0.300251
Q13	0.815458	0.312459	0.274950	0.294103	0.295836	0.352258
Q14	1.000000	0.366818	0.331220	0.302586	0.343710	0.364892
Q15	0.366818	1.000000	0.355963	0.387438	0.392987	0.706287
Q16	0.331220	0.355963	1.000000	0.407393	0.457116	0.369788
Q17	0.302586	0.387438	0.407393	1.000000	0.463294	0.356621
Q18	0.343710	0.392987	0.457116	0.463294	1.000000	0.474259
Q19	0.364892	0.706287	0.369788	0.356621	0.474259	1.000000
Q20	0.335538	0.402351	0.616016	0.453554	0.516908	0.481036
Q21	0.301567	0.405535	0.419852	0.433791	0.497860	0.476422
Q22	0.429129	0.491007	0.506379	0.442069	0.541591	0.528559
Q23	0.346800	0.414130	0.424340	0.462947	0.404338	0.451753
Q24	0.406495	0.462520	0.473848	0.367113	0.494756	0.476221
Q25	0.402428	0.460310	0.502860	0.395227	0.521728	0.473232
Q26	0.455336	0.451812	0.452047	0.476536	0.496545	0.459463
Q27	0.457000	0.423724	0.426250	0.394049	0.477629	0.429531
Q28	0.469735	0.435879	0.426407	0.389671	0.482558	0.460921
Q29	0.473576	0.417513	0.436687	0.389398	0.487624	0.460802
Q30	0.470088	0.422594	0.439216	0.418615	0.470940	0.471406
Q31	0.454116	0.477730	0.385100	0.392922	0.414576	0.478692
Q32	0.431115	0.404013	0.436905	0.336052	0.416600	0.444534
Q33	0.412807	0.426043	0.465516	0.413670	0.452714	0.477509
Q34	0.472103	0.394449	0.405421	0.358686	0.486898	0.440100
Q35	0.451592	0.419630	0.470175	0.344513	0.484560	0.457662
Q36	0.402731	0.355077	0.394057	0.286446	0.420435	0.389007
Q37	0.421360	0.370558	0.405760	0.306290	0.431160	0.411850
Q38	0.439232	0.397316	0.403415	0.341869	0.431828	0.389206
Q39	0.413439	0.408598	0.408478	0.366646	0.470898	0.415708

Q40	0.444357	0.395230	0.377267	0.357061	0.444371	0.409060
Q41	0.451588	0.376564	0.438724	0.365074	0.467683	0.409157
Q42	0.357921	0.410909	0.321681	0.362830	0.421759	0.358577
Q43	0.382628	0.331903	0.341108	0.356387	0.420147	0.351934
Q44	0.440450	0.385018	0.398282	0.360869	0.486233	0.416270
Q45	0.458490	0.407980	0.430431	0.352598	0.479516	0.448020
Q46	0.319416	0.340373	0.375115	0.318009	0.348598	0.350266
Q47	0.342356	0.272063	0.289763	0.281359	0.321858	0.264229
Q48	0.330021	0.301816	0.473180	0.351794	0.357681	0.326106
Q49	0.350834	0.346952	0.341345	0.351576	0.462460	0.346204
Q50	0.385305	0.494094	0.287950	0.362425	0.341271	0.434657
Q51	0.374626	0.455729	0.300553	0.351974	0.360988	0.477174
Q52	0.348618	0.363569	0.352126	0.497804	0.380392	0.356412
Q53	0.341339	0.312604	0.383638	0.392978	0.408145	0.343715
Q54	0.335342	0.297523	0.329961	0.298820	0.345829	0.333847
	Q20	Q21	Q22	Q23	Q24	Q25
Q2	0.308611	0.276281	0.356835	0.303824	0.334236	0.374950
Q3	0.333662	0.276946	0.411876	0.294212	0.406998	0.442695
Q4	0.326423	0.338952	0.412586	0.349467	0.379831	0.435978
Q5	0.457923	0.372081	0.488814	0.349542	0.413777	0.482716
Q6	0.335002	0.297026	0.324126	0.311471	0.310513	0.347899
Q7	0.275669	0.266423	0.332882	0.313827	0.286409	0.337155
Q8	0.301156	0.276639	0.367933	0.295690	0.325603	0.356388
Q9	0.265865	0.244671	0.357234	0.291796	0.293693	0.326043
Q10	0.300850	0.300951	0.389807	0.334519	0.339088	0.373867
Q11	0.306601	0.304933	0.358353	0.332208	0.308164	0.341031
Q12	0.249548	0.245149	0.362077	0.247551	0.276901	0.309578
Q13	0.305814	0.298054	0.382580	0.338425	0.345241	0.364967
Q14	0.335538	0.301567	0.429129	0.346800	0.406495	0.402428
Q15	0.402351	0.405535	0.491007	0.414130	0.462520	0.460310
Q16	0.616016	0.419852	0.506379	0.424340	0.473848	0.502860
Q17	0.453554	0.433791	0.442069	0.462947	0.367113	0.395227
Q18	0.516908	0.497860	0.541591	0.404338	0.494756	0.521728
Q19	0.481036	0.476422	0.528559	0.451753	0.476221	0.473232
Q20	1.000000	0.534017	0.547199	0.505418	0.517430	0.517197
Q21	0.534017	1.000000	0.523234	0.496588	0.414990	0.454115
Q22	0.547199	0.523234	1.000000	0.570359	0.585500	0.604061
Q23	0.505418	0.496588	0.570359	1.000000	0.530033	0.519820
Q24	0.517430	0.414990	0.585500	0.530033	1.000000	0.827263
Q25	0.517197	0.454115	0.604061	0.519820	0.827263	1.000000
Q26	0.447659	0.436083	0.537614	0.441568	0.525812	0.525099
Q27	0.465098	0.401964	0.586436	0.406569	0.507630	0.545683
Q28	0.488829	0.428854	0.549640	0.429913	0.560574	0.608833
Q29	0.471864	0.415328	0.573508	0.409095	0.520602	0.595087
Q30	0.457192	0.369337	0.533114	0.412837	0.498113	0.555372
Q31	0.436864	0.341354	0.558676	0.439180	0.542217	0.548001
Q32	0.449190	0.366832	0.564493	0.394548	0.502128	0.545012
Q33	0.469224	0.453515	0.560165	0.412207	0.486432	0.526426
Q34	0.439149	0.400473	0.580689	0.395214	0.514808	0.534561
Q35	0.465331	0.398426	0.531740	0.426737	0.532371	0.550610

Q36	0.419755	0.321381	0.460875	0.325795	0.479495	0.509940
Q37	0.418497	0.347667	0.457799	0.340661	0.481524	0.522614
Q38	0.403438	0.363540	0.461124	0.370814	0.494873	0.480912
Q39	0.431404	0.381593	0.481710	0.352652	0.484247	0.488275
Q40	0.416440	0.402508	0.491744	0.394200	0.460315	0.483429
Q41	0.466351	0.368527	0.507496	0.396612	0.469943	0.510713
Q42	0.372147	0.364566	0.450961	0.365465	0.400110	0.441976
Q43	0.380823	0.357067	0.456097	0.331622	0.385613	0.418366
Q44	0.432170	0.392732	0.483341	0.385389	0.487317	0.516393
Q45	0.458419	0.377815	0.479345	0.371078	0.492861	0.551748
Q46	0.365966	0.319373	0.408799	0.351198	0.416625	0.418452
Q47	0.313135	0.293735	0.374877	0.286149	0.323217	0.317077
Q48	0.444573	0.359226	0.439917	0.330607	0.403408	0.435574
Q49	0.403336	0.375483	0.411107	0.360768	0.390071	0.402989
Q50	0.366114	0.363842	0.406503	0.340978	0.414764	0.429179
Q51	0.371167	0.371900	0.411586	0.342821	0.418548	0.423856
Q52	0.407322	0.415333	0.382991	0.409514	0.374672	0.383834
Q53	0.415090	0.406580	0.368555	0.416902	0.384885	0.397476
Q54	0.341724	0.371537	0.408214	0.345867	0.402998	0.404859
	Q26	Q27	Q28	Q29	Q30	Q31
Q2	0.428751	0.417963	0.427937	0.444911	0.416882	0.399825
Q3	0.439242	0.457675	0.470145	0.461300	0.427139	0.434322
Q4	0.439585	0.448505	0.464737	0.459312	0.474516	0.438221
Q5	0.480427	0.509356	0.511443	0.558087	0.477697	0.451497
Q6	0.389685	0.355437	0.389542	0.406007	0.355041	0.326684
Q7	0.443931	0.395160	0.399001	0.415191	0.410642	0.383710
Q8	0.412015	0.401104	0.399360	0.421184	0.438022	0.391785
Q9	0.386264	0.376393	0.384720	0.403384	0.411385	0.353134
Q10	0.428997	0.414492	0.431165	0.441670	0.457800	0.400245
Q11	0.445092	0.419685	0.403085	0.436172	0.411226	0.366414
Q12	0.346343	0.366315	0.373800	0.379615	0.387964	0.406066
Q13	0.435020	0.409054	0.423151	0.442316	0.438026	0.416451
Q14	0.455336	0.457000	0.469735	0.473576	0.470088	0.454116
Q15	0.451812	0.423724	0.435879	0.417513	0.422594	0.477730
Q16	0.452047	0.426250	0.426407	0.436687	0.439216	0.385100
Q17	0.476536	0.394049	0.389671	0.389398	0.418615	0.392922
Q18	0.496545	0.477629	0.482558	0.487624	0.470940	0.414576
Q19	0.459463	0.429531	0.460921	0.460802	0.471406	0.478692
Q20	0.447659	0.465098	0.488829	0.471864	0.457192	0.436864
Q21	0.436083	0.401964	0.428854	0.415328	0.369337	0.341354
Q22	0.537614	0.586436	0.549640	0.573508	0.533114	0.558676
Q23	0.441568	0.406569	0.429913	0.409095	0.412837	0.439180
Q24	0.525812	0.507630	0.560574	0.520602	0.498113	0.542217
Q25	0.525099	0.545683	0.608833	0.595087	0.555372	0.548001
Q26	1.000000	0.732432	0.701238	0.690680	0.676804	0.643153
Q27	0.732432	1.000000	0.744082	0.726703	0.697420	0.662126
Q28	0.701238	0.744082	1.000000	0.774952	0.685342	0.652509
Q29	0.690680	0.726703	0.774952	1.000000	0.724066	0.649271
Q30	0.676804	0.697420	0.685342	0.724066	1.000000	0.704651
Q31	0.643153	0.662126	0.652509	0.649271	0.704651	1.000000

Q32	0.598467	0.683553	0.692132	0.638563	0.657557	0.703133
Q33	0.611082	0.686365	0.650104	0.642037	0.672546	0.636146
Q34	0.637743	0.691313	0.645614	0.651592	0.681460	0.671390
Q35	0.634531	0.654533	0.691972	0.652235	0.685344	0.666987
Q36	0.565318	0.633376	0.632055	0.652407	0.612134	0.576712
Q37	0.581277	0.629418	0.643342	0.648024	0.617556	0.587740
Q38	0.593187	0.582823	0.560821	0.542415	0.577080	0.580692
Q39	0.579242	0.621842	0.621348	0.602875	0.599801	0.565651
Q40	0.549009	0.582533	0.589417	0.578719	0.575908	0.532850
Q41	0.610611	0.651617	0.644570	0.641171	0.635538	0.596648
Q42	0.558267	0.529429	0.552884	0.546838	0.564794	0.522401
Q43	0.496012	0.535059	0.541914	0.545051	0.529779	0.510813
Q44	0.607408	0.607919	0.616583	0.621965	0.609187	0.571022
Q45	0.584002	0.620593	0.632482	0.626326	0.636830	0.609370
Q46	0.556140	0.506854	0.492569	0.531900	0.522271	0.489542
Q47	0.460168	0.458139	0.451197	0.460852	0.454801	0.388726
Q48	0.530907	0.495849	0.525909	0.533067	0.504128	0.437956
Q49	0.551961	0.493637	0.516393	0.521570	0.500297	0.454077
Q50	0.544281	0.504108	0.515031	0.501624	0.498104	0.564148
Q51	0.519215	0.486695	0.483304	0.488437	0.473006	0.532848
Q52	0.486063	0.442352	0.436852	0.467537	0.429717	0.393054
Q53	0.504914	0.463056	0.477163	0.479348	0.493083	0.420645
Q54	0.522208	0.495466	0.501034	0.516467	0.507254	0.461787
	Q32	Q33	Q34	Q35	Q36	Q37
Q2	0.424112	0.381603	0.393682	0.416941	0.382665	0.393789
Q3	0.463779	0.430525	0.433108	0.472416	0.394169	0.411396
Q4	0.468021	0.429475	0.440378	0.463387	0.396005	0.410375
Q5	0.464137	0.499942	0.469702	0.495754	0.462761	0.474262
Q6	0.371374	0.364611	0.328023	0.382158	0.366804	0.374561
Q7	0.361144	0.364118	0.363691	0.375628	0.361170	0.356720
Q8	0.391086	0.375589	0.409903	0.392013	0.381137	0.378488
Q9	0.377112	0.366897	0.399380	0.372250	0.360052	0.366731
Q10	0.404967	0.403914	0.414356	0.428604	0.383672	0.406230
Q11	0.346567	0.362363	0.377427	0.375969	0.364583	0.372841
Q12	0.364051	0.334574	0.395801	0.360600	0.377226	0.373640
Q13	0.381366	0.365640	0.400282	0.393811	0.397457	0.390787
Q14	0.431115	0.412807	0.472103	0.451592	0.402731	0.421360
Q15	0.404013	0.426043	0.394449	0.419630	0.355077	0.370558
Q16	0.436905	0.465516	0.405421	0.470175	0.394057	0.405760
Q17	0.336052	0.413670	0.358686	0.344513	0.286446	0.306290
Q18	0.416600	0.452714	0.486898	0.484560	0.420435	0.431160
Q19	0.444534	0.477509	0.440100	0.457662	0.389007	0.411850
Q20	0.449190	0.469224	0.439149	0.465331	0.419755	0.418497
Q21	0.366832	0.453515	0.400473	0.398426	0.321381	0.347667
Q22	0.564493	0.560165	0.580689	0.531740	0.460875	0.457799
Q23	0.394548	0.412207	0.395214	0.426737	0.325795	0.340661
Q24	0.502128	0.486432	0.514808	0.532371	0.479495	0.481524
Q25	0.545012	0.526426	0.534561	0.550610	0.509940	0.522614
Q26	0.598467	0.611082	0.637743	0.634531	0.565318	0.581277
Q27	0.683553	0.686365	0.691313	0.654533	0.633376	0.629418

Q28	0.692132	0.650104	0.645614	0.691972	0.632055	0.643342
Q29	0.638563	0.642037	0.651592	0.652235	0.652407	0.648024
Q30	0.657557	0.672546	0.681460	0.685344	0.612134	0.617556
Q31	0.703133	0.636146	0.671390	0.666987	0.576712	0.587740
Q32	1.000000	0.728496	0.695890	0.723323	0.591039	0.629773
Q33	0.728496	1.000000	0.727728	0.700759	0.596875	0.633495
Q34	0.695890	0.727728	1.000000	0.760586	0.607115	0.621824
Q35	0.723323	0.700759	0.760586	1.000000	0.636745	0.660111
Q36	0.591039	0.596875	0.607115	0.636745	1.000000	0.893105
Q37	0.629773	0.633495	0.621824	0.660111	0.893105	1.000000
Q38	0.531943	0.562012	0.567632	0.576032	0.542702	0.529390
Q39	0.619128	0.587954	0.602842	0.621980	0.594597	0.591668
Q40	0.558689	0.578236	0.585576	0.599888	0.527951	0.550508
Q41	0.604727	0.614382	0.626916	0.648817	0.551439	0.591882
Q42	0.505356	0.500462	0.526138	0.528484	0.497811	0.495856
Q43	0.507820	0.517388	0.544465	0.508593	0.512989	0.507180
Q44	0.571990	0.576602	0.592552	0.594946	0.589886	0.589960
Q45	0.600903	0.615329	0.620696	0.644522	0.620960	0.640870
Q46	0.451544	0.464406	0.491671	0.506049	0.518783	0.500326
Q47	0.414154	0.435243	0.482350	0.469932	0.469057	0.490624
Q48	0.497317	0.535117	0.485277	0.559643	0.514550	0.523667
Q49	0.424814	0.418170	0.465971	0.471433	0.436460	0.454159
Q50	0.455274	0.460138	0.457778	0.460782	0.474830	0.478364
Q51	0.440210	0.442825	0.448814	0.447489	0.441129	0.460905
Q52	0.405503	0.458404	0.422787	0.414736	0.379239	0.403292
Q53	0.419468	0.440809	0.452752	0.474686	0.440000	0.459725
Q54	0.465013	0.484577	0.500721	0.511504	0.513233	0.522333
	Q38	Q39	Q40	Q41	Q42	Q43
Q2	0.413526	0.413556	0.378980	0.433564	0.330941	0.349571
Q3	0.426906	0.460940	0.439635	0.452772	0.366970	0.385968
Q4	0.432117	0.431145	0.449842	0.428203	0.402901	0.377587
Q5	0.406718	0.434052	0.446649	0.486864	0.360905	0.382337
Q6	0.326829	0.363890	0.391176	0.323343	0.312026	0.325680
Q7	0.370611	0.362899	0.382361	0.382585	0.313724	0.325863
Q8	0.371670	0.395533	0.364834	0.390829	0.307529	0.296925
Q9	0.331850	0.356928	0.364470	0.392462	0.315484	0.324753
Q10	0.378151	0.387479	0.410042	0.430989	0.307033	0.323986
Q11	0.366969	0.378288	0.370120	0.385872	0.314646	0.349177
Q12	0.365662	0.364076	0.325833	0.357715	0.292327	0.307310
Q13	0.379943	0.396763	0.391162	0.383274	0.332299	0.344977
Q14	0.439232	0.413439	0.444357	0.451588	0.357921	0.382628
Q15	0.397316	0.408598	0.395230	0.376564	0.410909	0.331903
Q16	0.403415	0.408478	0.377267	0.438724	0.321681	0.341108
Q17	0.341869	0.366646	0.357061	0.365074	0.362830	0.356387
Q18	0.431828	0.470898	0.444371	0.467683	0.421759	0.420147
Q19	0.389206	0.415708	0.409060	0.409157	0.358577	0.351934
Q20	0.403438	0.431404	0.416440	0.466351	0.372147	0.380823
Q21	0.363540	0.381593	0.402508	0.368527	0.364566	0.357067
Q22	0.461124	0.481710	0.491744	0.507496	0.450961	0.456097
Q23	0.370814	0.352652	0.394200	0.396612	0.365465	0.331622

Q24	0.494873	0.484247	0.460315	0.469943	0.400110	0.385613
Q25	0.480912	0.488275	0.483429	0.510713	0.441976	0.418366
Q26	0.593187	0.579242	0.549009	0.610611	0.558267	0.496012
Q27	0.582823	0.621842	0.582533	0.651617	0.529429	0.535059
Q28	0.560821	0.621348	0.589417	0.644570	0.552884	0.541914
Q29	0.542415	0.602875	0.578719	0.641171	0.546838	0.545051
Q30	0.577080	0.599801	0.575908	0.635538	0.564794	0.529779
Q31	0.580692	0.565651	0.532850	0.596648	0.522401	0.510813
Q32	0.531943	0.619128	0.558689	0.604727	0.505356	0.507820
Q33	0.562012	0.587954	0.578236	0.614382	0.500462	0.517388
Q34	0.567632	0.602842	0.585576	0.626916	0.526138	0.544465
Q35	0.576032	0.621980	0.599888	0.648817	0.528484	0.508593
Q36	0.542702	0.594597	0.527951	0.551439	0.497811	0.512989
Q37	0.529390	0.591668	0.550508	0.591882	0.495856	0.507180
Q38	1.000000	0.695594	0.669663	0.636841	0.572694	0.553795
Q39	0.695594	1.000000	0.730634	0.670152	0.602593	0.601504
Q40	0.669663	0.730634	1.000000	0.679745	0.641592	0.574809
Q41	0.636841	0.670152	0.679745	1.000000	0.646082	0.582965
Q42	0.572694	0.602593	0.641592	0.646082	1.000000	0.681941
Q43	0.553795	0.601504	0.574809	0.582965	0.681941	1.000000
Q44	0.652444	0.671820	0.646605	0.684124	0.592656	0.609266
Q45	0.645388	0.688839	0.642907	0.719874	0.554249	0.577016
Q46	0.467909	0.476210	0.465852	0.492147	0.503784	0.501651
Q47	0.415177	0.447873	0.421097	0.449037	0.456863	0.579280
Q48	0.435712	0.486526	0.471718	0.474024	0.467708	0.427922
Q49	0.436841	0.450255	0.472752	0.477112	0.496164	0.418089
Q50	0.468369	0.456194	0.460501	0.450859	0.466391	0.414089
Q51	0.410632	0.433030	0.448966	0.423475	0.437751	0.405082
Q52	0.412219	0.446032	0.459876	0.457192	0.466928	0.426052
Q53	0.440342	0.471530	0.483208	0.479114	0.512018	0.488085
Q54	0.466612	0.477166	0.484299	0.485436	0.527247	0.560357
	Q44	Q45	Q46	Q47	Q48	Q49
Q2	0.416834	0.440545	0.321998	0.314942	0.348419	0.287570
Q3	0.400964	0.452104	0.320986	0.312391	0.349071	0.325529
Q4	0.433351	0.437638	0.301516	0.279123	0.372406	0.371370
Q5	0.450415	0.476178	0.339135	0.327153	0.425325	0.397781
Q6	0.341251	0.361073	0.316108	0.305301	0.334397	0.353042
Q7	0.391368	0.390775	0.290685	0.280437	0.282716	0.305602
Q8	0.389625	0.407208	0.282367	0.275624	0.276830	0.288605
Q9	0.361998	0.393284	0.269744	0.296699	0.252611	0.264485
Q10	0.390093	0.414202	0.281352	0.319152	0.305611	0.277600
Q11	0.380700	0.378461	0.291611	0.303322	0.309471	0.303352
Q12	0.363793	0.398702	0.218218	0.229780	0.215427	0.260133
Q13	0.399877	0.420355	0.284999	0.277088	0.300047	0.306552
Q14	0.440450	0.458490	0.319416	0.342356	0.330021	0.350834
Q15	0.385018	0.407980	0.340373	0.272063	0.301816	0.346952
Q16	0.398282	0.430431	0.375115	0.289763	0.473180	0.341345
Q17	0.360869	0.352598	0.318009	0.281359	0.351794	0.351576
Q18	0.486233	0.479516	0.348598	0.321858	0.357681	0.462460
Q19	0.416270	0.448020	0.350266	0.264229	0.326106	0.346204

Q20	0.432170	0.458419	0.365966	0.313135	0.444573	0.403336
Q21	0.392732	0.377815	0.319373	0.293735	0.359226	0.375483
Q22	0.483341	0.479345	0.408799	0.374877	0.439917	0.411107
Q23	0.385389	0.371078	0.351198	0.286149	0.330607	0.360768
Q24	0.487317	0.492861	0.416625	0.323217	0.403408	0.390071
Q25	0.516393	0.551748	0.418452	0.317077	0.435574	0.402989
Q26	0.607408	0.584002	0.556140	0.460168	0.530907	0.551961
Q27	0.607919	0.620593	0.506854	0.458139	0.495849	0.493637
Q28	0.616583	0.632482	0.492569	0.451197	0.525909	0.516393
Q29	0.621965	0.626326	0.531900	0.460852	0.533067	0.521570
Q30	0.609187	0.636830	0.522271	0.454801	0.504128	0.500297
Q31	0.571022	0.609370	0.489542	0.388726	0.437956	0.454077
Q32	0.571990	0.600903	0.451544	0.414154	0.497317	0.424814
Q33	0.576602	0.615329	0.464406	0.435243	0.535117	0.418170
Q34	0.592552	0.620696	0.491671	0.482350	0.485277	0.465971
Q35	0.594946	0.644522	0.506049	0.469932	0.559643	0.471433
Q36	0.589886	0.620960	0.518783	0.469057	0.514550	0.436460
Q37	0.589960	0.640870	0.500326	0.490624	0.523667	0.454159
Q38	0.652444	0.645388	0.467909	0.415177	0.435712	0.436841
Q39	0.671820	0.688839	0.476210	0.447873	0.486526	0.450255
Q40	0.646605	0.642907	0.465852	0.421097	0.471718	0.472752
Q41	0.684124	0.719874	0.492147	0.449037	0.474024	0.477112
Q42	0.592656	0.554249	0.503784	0.456863	0.467708	0.496164
Q43	0.609266	0.577016	0.501651	0.579280	0.427922	0.418089
Q44	1.000000	0.730511	0.486998	0.438024	0.474968	0.509391
Q45	0.730511	1.000000	0.493011	0.444023	0.485762	0.485481
Q46	0.486998	0.493011	1.000000	0.664647	0.514775	0.475942
Q47	0.438024	0.444023	0.664647	1.000000	0.496500	0.408780
Q48	0.474968	0.485762	0.514775	0.496500	1.000000	0.526936
Q49	0.509391	0.485481	0.475942	0.408780	0.526936	1.000000
Q50	0.487536	0.479167	0.493917	0.388337	0.444333	0.621335
Q51	0.460344	0.444910	0.505973	0.397958	0.432277	0.590878
Q52	0.437518	0.424866	0.503353	0.435497	0.530911	0.586331
Q53	0.495061	0.460677	0.566025	0.476601	0.565010	0.604878
Q54	0.522308	0.483629	0.667332	0.621165	0.555375	0.499493
	Q50	Q51	Q52	Q53	Q54	Q55
Q2	0.326807	0.320764	0.311274	0.303846	0.291628	0.382409
Q3	0.356713	0.333934	0.318585	0.309732	0.313522	0.409983
Q4	0.377079	0.381823	0.338668	0.290085	0.299332	0.395541
Q5	0.383225	0.370704	0.367515	0.369198	0.324901	0.507270
Q6	0.307034	0.317740	0.329276	0.307794	0.312923	0.341476
Q7	0.342105	0.346711	0.276175	0.285270	0.268511	0.356262
Q8	0.333698	0.319538	0.271072	0.261492	0.250178	0.357747
Q9	0.291493	0.288013	0.262201	0.276188	0.273343	0.346790
Q10	0.340399	0.328903	0.318801	0.294983	0.277495	0.379870
Q11	0.341908	0.342760	0.312745	0.292157	0.269521	0.359303
Q12	0.318496	0.291875	0.216967	0.230799	0.221118	0.347829
Q13	0.372012	0.358440	0.285042	0.305079	0.289163	0.381888
Q14	0.385305	0.374626	0.348618	0.341339	0.335342	0.449310
Q15	0.494094	0.455729	0.363569	0.312604	0.297523	0.389840

Q16	0.287950	0.300553	0.352126	0.383638	0.329961	0.406794
Q17	0.362425	0.351974	0.497804	0.392978	0.298820	0.379788
Q18	0.341271	0.360988	0.380392	0.408145	0.345829	0.448426
Q19	0.434657	0.477174	0.356412	0.343715	0.333847	0.437254
Q20	0.366114	0.371167	0.407322	0.415090	0.341724	0.458195
Q21	0.363842	0.371900	0.415333	0.406580	0.371537	0.365951
Q22	0.406503	0.411586	0.382991	0.368555	0.408214	0.562846
Q23	0.340978	0.342821	0.409514	0.416902	0.345867	0.403753
Q24	0.414764	0.418548	0.374672	0.384885	0.402998	0.485285
Q25	0.429179	0.423856	0.383834	0.397476	0.404859	0.517133
Q26	0.544281	0.519215	0.486063	0.504914	0.522208	0.613696
Q27	0.504108	0.486695	0.442352	0.463056	0.495466	0.652978
Q28	0.515031	0.483304	0.436852	0.477163	0.501034	0.645225
Q29	0.501624	0.488437	0.467537	0.479348	0.516467	0.676974
Q30	0.498104	0.473006	0.429717	0.493083	0.507254	0.665996
Q31	0.564148	0.532848	0.393054	0.420645	0.461787	0.610332
Q32	0.455274	0.440210	0.405503	0.419468	0.465013	0.629003
Q33	0.460138	0.442825	0.458404	0.440809	0.484577	0.636603
Q34	0.457778	0.448814	0.422787	0.452752	0.500721	0.628723
Q35	0.460782	0.447489	0.414736	0.474686	0.511504	0.640043
Q36	0.474830	0.441129	0.379239	0.440000	0.513233	0.630694
Q37	0.478364	0.460905	0.403292	0.459725	0.522333	0.635997
Q38	0.468369	0.410632	0.412219	0.440342	0.466612	0.532677
Q39	0.456194	0.433030	0.446032	0.471530	0.477166	0.564643
Q40	0.460501	0.448966	0.459876	0.483208	0.484299	0.555936
Q41	0.450859	0.423475	0.457192	0.479114	0.485436	0.627381
Q42	0.466391	0.437751	0.466928	0.512018	0.527247	0.564270
Q43	0.414089	0.405082	0.426052	0.488085	0.560357	0.557164
Q44	0.487536	0.460344	0.437518	0.495061	0.522308	0.594124
Q45	0.479167	0.444910	0.424866	0.460677	0.483629	0.602577
Q46	0.493917	0.505973	0.503353	0.566025	0.667332	0.602044
Q47	0.388337	0.397958	0.435497	0.476601	0.621165	0.595731
Q48	0.444333	0.432277	0.530911	0.565010	0.555375	0.593044
Q49	0.621335	0.590878	0.586331	0.604878	0.499493	0.545394
Q50	1.000000	0.888911	0.582394	0.574454	0.520282	0.566643
Q51	0.888911	1.000000	0.601567	0.609016	0.548225	0.554193
Q52	0.582394	0.601567	1.000000	0.649020	0.512644	0.530956
Q53	0.574454	0.609016	0.649020	1.000000	0.656864	0.577219
Q54	0.520282	0.548225	0.512644	0.656864	1.000000	0.639098
	Q56	Q57	Q58	Q59	Q60	Q61
Q2	0.381859	0.366863	0.399545	0.378914	0.335508	0.385243
Q3	0.432839	0.415086	0.460424	0.427840	0.398879	0.427177
Q4	0.394508	0.422922	0.435982	0.430472	0.370683	0.424362
Q5	0.465528	0.463810	0.484352	0.440216	0.440059	0.444596
Q6	0.392071	0.381529	0.385491	0.340513	0.379147	0.356906
Q7	0.335358	0.361982	0.376388	0.358682	0.372249	0.417428
Q8	0.316584	0.375361	0.362177	0.370622	0.345989	0.392843
Q9	0.322568	0.354399	0.349551	0.373160	0.336989	0.388501
Q10	0.361290	0.402384	0.382206	0.393807	0.374604	0.416301
Q11	0.345898	0.377649	0.371982	0.365992	0.353174	0.416130

Q12	0.291602	0.328455	0.323261	0.336132	0.327428	0.344661
Q13	0.349942	0.411135	0.399719	0.404730	0.380931	0.418361
Q14	0.398807	0.441741	0.422975	0.432047	0.419922	0.468175
Q15	0.363444	0.393767	0.386246	0.374461	0.399046	0.448891
Q16	0.406159	0.430407	0.454933	0.395682	0.398689	0.423290
Q17	0.386433	0.382669	0.403909	0.375739	0.368794	0.401328
Q18	0.430784	0.424238	0.462741	0.426472	0.429913	0.432507
Q19	0.413930	0.411424	0.443623	0.429623	0.453935	0.448303
Q20	0.441066	0.437303	0.466145	0.462398	0.429886	0.452339
Q21	0.358188	0.397416	0.401552	0.417049	0.418562	0.434893
Q22	0.514568	0.490071	0.541948	0.521410	0.527754	0.473109
Q23	0.423664	0.401035	0.451185	0.412939	0.428193	0.397015
Q24	0.488510	0.470241	0.522095	0.513520	0.458429	0.479383
Q25	0.513908	0.529406	0.545196	0.542013	0.495726	0.522911
Q26	0.617973	0.591250	0.679486	0.643590	0.609961	0.615434
Q27	0.592720	0.568914	0.640154	0.639494	0.624532	0.598932
Q28	0.644930	0.607111	0.644658	0.618491	0.611766	0.629970
Q29	0.648835	0.642927	0.665223	0.640212	0.639993	0.644787
Q30	0.604627	0.609630	0.647885	0.634974	0.603452	0.588733
Q31	0.593066	0.552973	0.619996	0.623141	0.615364	0.568689
Q32	0.590088	0.536896	0.593035	0.581505	0.562108	0.538778
Q33	0.591270	0.567269	0.625432	0.615958	0.596920	0.574058
Q34	0.587820	0.525895	0.607501	0.627176	0.613559	0.577276
Q35	0.626685	0.564192	0.629758	0.628850	0.626719	0.583774
Q36	0.604021	0.584789	0.604321	0.583731	0.551782	0.560840
Q37	0.597316	0.583461	0.605469	0.586349	0.568676	0.579124
Q38	0.542721	0.520116	0.592828	0.579664	0.525951	0.559790
Q39	0.547418	0.511712	0.587905	0.590721	0.542742	0.550486
Q40	0.545571	0.531317	0.594061	0.587013	0.579273	0.536406
Q41	0.591633	0.570316	0.615733	0.613653	0.580266	0.585199
Q42	0.558270	0.547249	0.581397	0.605216	0.577326	0.549327
Q43	0.547796	0.527086	0.550612	0.564501	0.554356	0.529015
Q44	0.590427	0.582664	0.619336	0.600856	0.595101	0.607451
Q45	0.577340	0.562559	0.626500	0.590055	0.590191	0.577884
Q46	0.651709	0.562435	0.663451	0.636629	0.568507	0.582108
Q47	0.592766	0.478177	0.587773	0.585185	0.533792	0.547724
Q48	0.595045	0.553772	0.590063	0.547257	0.538920	0.544062
Q49	0.565632	0.573060	0.567407	0.546431	0.555586	0.614927
Q50	0.570467	0.571752	0.555718	0.545917	0.547461	0.613764
Q51	0.566428	0.543831	0.555124	0.526962	0.545701	0.600504
Q52	0.558931	0.547571	0.546469	0.493279	0.523150	0.584316
Q53	0.621611	0.590785	0.591787	0.532809	0.559768	0.596373
Q54	0.690723	0.596835	0.650127	0.645411	0.590265	0.614354
	Q62	Q63	Q64	Q65	Q66	Q73
Q2	0.332829	0.388735	0.342754	0.334080	0.351780	0.459811
Q3	0.360119	0.412046	0.375311	0.398542	0.383783	0.442807
Q4	0.374283	0.405138	0.396650	0.397905	0.406095	0.487009
Q5	0.402229	0.463707	0.399870	0.419065	0.431231	0.428290
Q6	0.392790	0.408289	0.387988	0.406939	0.379991	0.382826
Q7	0.322167	0.344335	0.322726	0.346390	0.331007	0.393618

Q8	0.322307	0.359145	0.292964	0.296971	0.309182	0.418286
Q9	0.322618	0.342370	0.310288	0.304493	0.338832	0.385977
Q10	0.328120	0.371294	0.316769	0.326460	0.322829	0.420214
Q11	0.333763	0.367303	0.335507	0.342289	0.353813	0.390774
Q12	0.270120	0.315358	0.281697	0.281191	0.300062	0.389936
Q13	0.332805	0.372438	0.326519	0.341722	0.358126	0.429111
Q14	0.390476	0.426778	0.361940	0.385369	0.394350	0.494092
Q15	0.366147	0.401318	0.310908	0.344636	0.378305	0.405449
Q16	0.358674	0.417759	0.376530	0.390537	0.383997	0.424875
Q17	0.321906	0.375356	0.333713	0.316288	0.334604	0.317398
Q18	0.383563	0.425291	0.360332	0.398928	0.388561	0.397716
Q19	0.389871	0.419530	0.353084	0.386787	0.384821	0.404698
Q20	0.398122	0.439711	0.407961	0.434847	0.418406	0.418941
Q21	0.368737	0.397075	0.376130	0.356906	0.386610	0.333721
Q22	0.441515	0.482677	0.425772	0.451091	0.436063	0.496318
Q23	0.354876	0.377071	0.361195	0.389136	0.364079	0.383594
Q24	0.439003	0.461375	0.412552	0.459761	0.428041	0.474348
Q25	0.452132	0.483147	0.441778	0.475890	0.470638	0.496387
Q26	0.577484	0.618001	0.561332	0.544613	0.541544	0.596504
Q27	0.561556	0.597904	0.520169	0.548442	0.543602	0.609992
Q28	0.547251	0.586440	0.529439	0.566471	0.557654	0.584904
Q29	0.566233	0.622152	0.544915	0.539647	0.567639	0.585930
Q30	0.558390	0.584146	0.538473	0.530336	0.539622	0.573378
Q31	0.532644	0.553952	0.502131	0.526648	0.519624	0.576617
Q32	0.532316	0.537873	0.458977	0.535208	0.509479	0.562192
Q33	0.548291	0.563464	0.485447	0.510569	0.519082	0.571682
Q34	0.566023	0.567576	0.499164	0.541927	0.516050	0.552270
Q35	0.579213	0.603658	0.511954	0.557301	0.535591	0.587936
Q36	0.517758	0.590312	0.480627	0.507421	0.573322	0.583129
Q37	0.536412	0.603252	0.487303	0.540442	0.583725	0.555971
Q38	0.508630	0.523192	0.470579	0.478789	0.457259	0.564618
Q39	0.511782	0.539932	0.478151	0.504172	0.517176	0.556712
Q40	0.531822	0.544858	0.499304	0.525918	0.523371	0.551117
Q41	0.550249	0.565243	0.509063	0.536165	0.540318	0.568718
Q42	0.544390	0.529341	0.505101	0.490067	0.524194	0.497347
Q43	0.524685	0.522352	0.521010	0.503452	0.513042	0.501970
Q44	0.540192	0.560918	0.502343	0.513779	0.515107	0.553136
Q45	0.520348	0.541176	0.453705	0.506254	0.525427	0.600401
Q46	0.649517	0.620225	0.570185	0.608920	0.607772	0.482843
Q47	0.589663	0.545189	0.507272	0.531811	0.542540	0.423000
Q48	0.518216	0.570024	0.527287	0.538488	0.513748	0.500134
Q49	0.518102	0.538892	0.533203	0.556940	0.544405	0.453962
Q50	0.508297	0.530747	0.467964	0.500972	0.537344	0.485963
Q51	0.514005	0.535806	0.493754	0.517784	0.546925	0.466885
Q52	0.525420	0.552382	0.510026	0.499210	0.511758	0.419756
Q53	0.532307	0.584244	0.562995	0.572250	0.556743	0.419077
Q54	0.630262	0.606157	0.614637	0.584698	0.587424	0.478690
	Q74	Q75	Q76	Q77	Q78	Q79
Q2	0.378975	0.446530	0.407054	0.256002	0.386797	0.392435
Q3	0.383627	0.429128	0.447313	0.285370	0.444884	0.439761

Q4	0.431772	0.445727	0.484354	0.298204	0.465785	0.459287
Q5	0.338396	0.488925	0.474767	0.284413	0.473998	0.458600
Q6	0.281778	0.387120	0.391813	0.316085	0.423526	0.397345
Q7	0.561404	0.404882	0.392745	0.250369	0.370540	0.359382
Q8	0.576016	0.417241	0.400904	0.220000	0.345613	0.372713
Q9	0.563439	0.400064	0.392468	0.217485	0.342970	0.357477
Q10	0.609839	0.448407	0.432551	0.263804	0.406574	0.395541
Q11	0.627194	0.418946	0.409831	0.260901	0.403225	0.400034
Q12	0.484658	0.376961	0.387470	0.200526	0.327096	0.369107
Q13	0.627003	0.450749	0.441728	0.262909	0.421477	0.429961
Q14	0.601692	0.497173	0.460826	0.287891	0.433094	0.461052
Q15	0.394822	0.465947	0.388487	0.268803	0.354561	0.374224
Q16	0.367069	0.450299	0.392778	0.299445	0.428483	0.411430
Q17	0.310505	0.378799	0.309433	0.252401	0.347345	0.336298
Q18	0.343082	0.443291	0.380593	0.346941	0.419172	0.440877
Q19	0.385497	0.424756	0.379088	0.283488	0.387095	0.435842
Q20	0.351358	0.440526	0.429434	0.311694	0.437663	0.475002
Q21	0.310388	0.361397	0.363429	0.300418	0.373518	0.374493
Q22	0.420471	0.512320	0.469725	0.318584	0.434901	0.509481
Q23	0.372842	0.437224	0.350773	0.302580	0.412927	0.408029
Q24	0.376675	0.511887	0.485575	0.338401	0.482201	0.496778
Q25	0.414990	0.528860	0.515616	0.351496	0.511861	0.512746
Q26	0.511084	0.616220	0.561952	0.445743	0.603961	0.604353
Q27	0.507379	0.633567	0.621804	0.397818	0.591262	0.596887
Q28	0.498032	0.606597	0.603707	0.422937	0.602867	0.599532
Q29	0.495915	0.667159	0.595823	0.444287	0.627623	0.616993
Q30	0.525115	0.595068	0.590345	0.430789	0.571084	0.595180
Q31	0.488329	0.585454	0.557432	0.387281	0.554004	0.573875
Q32	0.475958	0.566059	0.573659	0.363206	0.504646	0.557708
Q33	0.488367	0.578863	0.561239	0.370447	0.522682	0.555514
Q34	0.460119	0.567810	0.549094	0.404756	0.511411	0.564132
Q35	0.505057	0.612084	0.560323	0.445225	0.531884	0.579310
Q36	0.495244	0.613347	0.666160	0.447767	0.607587	0.605192
Q37	0.505309	0.619858	0.657057	0.464065	0.609241	0.616647
Q38	0.458387	0.558852	0.534903	0.412504	0.543294	0.557908
Q39	0.496708	0.570376	0.614979	0.418831	0.561241	0.595505
Q40	0.469785	0.576907	0.512826	0.418746	0.521458	0.568788
Q41	0.517132	0.606280	0.576195	0.403527	0.557337	0.594801
Q42	0.447506	0.548413	0.501610	0.456356	0.520710	0.575043
Q43	0.441010	0.544972	0.528234	0.430007	0.521017	0.558414
Q44	0.465048	0.599758	0.578708	0.411301	0.566222	0.590429
Q45	0.520310	0.585169	0.600259	0.379383	0.533128	0.568550
Q46	0.390200	0.543574	0.519730	0.490897	0.535233	0.604232
Q47	0.414448	0.477591	0.467158	0.414717	0.426783	0.496734
Q48	0.431602	0.507532	0.493492	0.414320	0.507787	0.518788
Q49	0.385581	0.512197	0.464799	0.443794	0.543631	0.555022
Q50	0.465944	0.536582	0.492596	0.409254	0.547818	0.562630
Q51	0.440787	0.526997	0.484770	0.407560	0.545344	0.558399
Q52	0.373848	0.500654	0.422728	0.384043	0.504654	0.502333
Q53	0.384363	0.525103	0.438386	0.469211	0.524103	0.561414

Q54	0.419969	0.534043	0.493792	0.476048	0.524295	0.582911
	Q80	Q81	Q82	Q83	Q84	Q85
Q2	0.366514	0.436864	0.430955	0.386528	0.471897	0.215069
Q3	0.432454	0.470069	0.497213	0.431674	0.497826	0.246576
Q4	0.448373	0.477787	0.488307	0.460928	0.506630	0.244794
Q5	0.451878	0.503524	0.511059	0.463385	0.525132	0.319366
Q6	0.410484	0.393651	0.400136	0.406906	0.398990	0.235225
Q7	0.360186	0.401325	0.392333	0.376670	0.394588	0.220844
Q8	0.355696	0.424013	0.392180	0.393311	0.428803	0.225236
Q9	0.356658	0.387115	0.372709	0.378472	0.402954	0.243854
Q10	0.366888	0.441972	0.417828	0.407924	0.442343	0.236101
Q11	0.413043	0.430301	0.414792	0.411424	0.430170	0.260996
Q12	0.331564	0.374365	0.347895	0.342837	0.393797	0.184228
Q13	0.410171	0.455345	0.430017	0.430053	0.455518	0.249829
Q14	0.455486	0.483700	0.452458	0.465855	0.489651	0.318523
Q15	0.369303	0.372142	0.348345	0.388586	0.383675	0.288099
Q16	0.417376	0.458164	0.433487	0.402006	0.428735	0.322040
Q17	0.372920	0.375429	0.374124	0.359461	0.329208	0.286806
Q18	0.436837	0.402947	0.410828	0.409698	0.431314	0.302415
Q19	0.414298	0.381806	0.379379	0.406863	0.403358	0.272631
Q20	0.446588	0.454479	0.405860	0.411235	0.423241	0.321293
Q21	0.396572	0.378040	0.340160	0.400779	0.372993	0.271912
Q22	0.459178	0.468654	0.463090	0.459802	0.500194	0.331383
Q23	0.392692	0.397135	0.400244	0.399837	0.383179	0.291428
Q24	0.465346	0.493477	0.476477	0.473834	0.507601	0.311731
Q25	0.470456	0.527901	0.502300	0.508485	0.535280	0.310576
Q26	0.578548	0.611430	0.603140	0.610478	0.616728	0.418666
Q27	0.571591	0.615356	0.602232	0.580019	0.631894	0.425457
Q28	0.582844	0.607400	0.580913	0.600831	0.606704	0.384006
Q29	0.580095	0.640472	0.600917	0.633758	0.648054	0.424924
Q30	0.574484	0.600835	0.576166	0.582419	0.589622	0.395146
Q31	0.561432	0.590864	0.562017	0.564899	0.568666	0.375242
Q32	0.541012	0.541290	0.503473	0.511509	0.538530	0.370712
Q33	0.562369	0.589474	0.529690	0.556363	0.552209	0.389388
Q34	0.555058	0.544938	0.527087	0.551185	0.569260	0.402520
Q35	0.577138	0.574982	0.550061	0.561911	0.590720	0.417153
Q36	0.581342	0.602473	0.569236	0.576993	0.628316	0.420813
Q37	0.602989	0.628328	0.574067	0.607657	0.633578	0.435786
Q38	0.523108	0.533177	0.525057	0.517805	0.565429	0.364333
Q39	0.566733	0.553846	0.528120	0.538702	0.569227	0.379706
Q40	0.551139	0.534348	0.538942	0.553467	0.545845	0.419988
Q41	0.552931	0.577846	0.564483	0.568195	0.600877	0.429522
Q42	0.544377	0.500104	0.480975	0.543322	0.507405	0.407587
Q43	0.546785	0.502816	0.470031	0.504451	0.522579	0.452236
Q44	0.593773	0.586216	0.527479	0.562393	0.599093	0.406699
Q45	0.571941	0.565090	0.552810	0.548229	0.597842	0.401435
Q46	0.564994	0.525770	0.496727	0.534430	0.513782	0.464884
Q47	0.470678	0.473177	0.435920	0.449811	0.467097	0.421450
Q48	0.509262	0.532132	0.518866	0.534777	0.524147	0.375138
Q49	0.540643	0.536145	0.534106	0.576716	0.540446	0.358388

Q50	0.559815	0.546752	0.548138	0.592813	0.529225	0.383069
Q51	0.563976	0.535813	0.535147	0.586329	0.503794	0.387722
Q52	0.502505	0.471618	0.493553	0.546134	0.458913	0.379065
Q53	0.539695	0.518762	0.489300	0.545261	0.476067	0.455521
Q54	0.554311	0.535961	0.486638	0.541504	0.509446	0.449444
	Q86	Q87	Q88	Q89		
Q2	0.236018	0.411655	0.429312	0.375929		
Q3	0.251998	0.442742	0.458925	0.401566		
Q4	0.306239	0.412829	0.432284	0.416786		
Q5	0.347843	0.471091	0.492822	0.495971		
Q6	0.332047	0.343826	0.401508	0.396499		
Q7	0.253779	0.378439	0.363128	0.339942		
Q8	0.216772	0.406233	0.366054	0.333445		
Q9	0.214537	0.380728	0.359193	0.349946		
Q10	0.245688	0.425786	0.413857	0.367472		
Q11	0.293448	0.385808	0.363907	0.374424		
Q12	0.168755	0.368163	0.329259	0.285753		
Q13	0.262120	0.410773	0.376261	0.384102		
Q14	0.298955	0.482012	0.456903	0.429137		
Q15	0.282784	0.415116	0.332856	0.363740		
Q16	0.291542	0.451282	0.412110	0.434656		
Q17	0.302801	0.346230	0.319253	0.343202		
Q18	0.282169	0.421988	0.374720	0.422915		
Q19	0.234761	0.443653	0.363699	0.380744		
Q20	0.303834	0.431470	0.408596	0.415341		
Q21	0.304576	0.365904	0.346647	0.396517		
Q22	0.265841	0.517796	0.484041	0.457820		
Q23	0.300832	0.403142	0.379763	0.400260		
Q24	0.297485	0.480412	0.467502	0.504769		
Q25	0.310768	0.514612	0.492088	0.532198		
Q26	0.436783	0.610176	0.579528	0.590364		
Q27	0.350643	0.624856	0.620422	0.574298		
Q28	0.367619	0.630113	0.584323	0.563301		
Q29	0.431122	0.659088	0.636424	0.594521		
Q30	0.398951	0.596932	0.570961	0.568038		
Q31	0.344763	0.579972	0.547285	0.541206		
Q32	0.265475	0.548459	0.547524	0.478911		
Q33	0.329810	0.575525	0.558894	0.515172		
Q34	0.322421	0.573496	0.563788	0.508474		
Q35	0.349667	0.586864	0.609258	0.549677		
Q36	0.374224	0.591905	0.596351	0.544147		
Q37	0.382426	0.601346	0.611907	0.547976		
Q38	0.345298	0.531157	0.509803	0.504855		
Q39	0.337260	0.550817	0.532470	0.492178		
Q40	0.371075	0.526709	0.534160	0.528504		
Q41	0.364079	0.604119	0.590020	0.538230		
Q42	0.382939	0.518094	0.467150	0.494835		
Q43	0.351980	0.529728	0.522712	0.473333		
Q44	0.392310	0.576293	0.559364	0.545450		
Q45	0.336840	0.595469	0.566887	0.517769		

Q46	0.433298	0.536575	0.525802	0.536914
Q47	0.342099	0.469180	0.511693	0.448335
Q48	0.416359	0.535687	0.491181	0.552170
Q49	0.461321	0.501582	0.453914	0.535400
Q50	0.437487	0.528719	0.457939	0.535295
Q51	0.440590	0.521398	0.454948	0.525016
Q52	0.438540	0.490167	0.445469	0.503507
Q53	0.481996	0.541416	0.472247	0.560335
Q54	0.431761	0.540162	0.510098	0.538432

	Q2	Q3	Q4	Q5	Q6	Q7
Q55	0.382409	0.409983	0.395541	0.507270	0.341476	0.356262
Q56	0.381859	0.432839	0.394508	0.465528	0.392071	0.335358
Q57	0.366863	0.415086	0.422922	0.463810	0.381529	0.361982
Q58	0.399545	0.460424	0.435982	0.484352	0.385491	0.376388
Q59	0.378914	0.427840	0.430472	0.440216	0.340513	0.358682
Q60	0.335508	0.398879	0.370683	0.440059	0.379147	0.372249
Q61	0.385243	0.427177	0.424362	0.444596	0.356906	0.417428
Q62	0.332829	0.360119	0.374283	0.402229	0.392790	0.322167
Q63	0.388735	0.412046	0.405138	0.463707	0.408289	0.344335
Q64	0.342754	0.375311	0.396650	0.399870	0.387988	0.322726
Q65	0.334080	0.398542	0.397905	0.419065	0.406939	0.346390
Q66	0.351780	0.383783	0.406095	0.431231	0.379991	0.331007
Q73	0.459811	0.442807	0.487009	0.428290	0.382826	0.393618
Q74	0.378975	0.383627	0.431772	0.338396	0.281778	0.561404
Q75	0.446530	0.429128	0.445727	0.488925	0.387120	0.404882
Q76	0.407054	0.447313	0.484354	0.474767	0.391813	0.392745
Q77	0.256002	0.285370	0.298204	0.284413	0.316085	0.250369
Q78	0.386797	0.444884	0.465785	0.473998	0.423526	0.370540
Q79	0.392435	0.439761	0.459287	0.458600	0.397345	0.359382
Q80	0.366514	0.432454	0.448373	0.451878	0.410484	0.360186
Q81	0.436864	0.470069	0.477787	0.503524	0.393651	0.401325
Q82	0.430955	0.497213	0.488307	0.511059	0.400136	0.392333
Q83	0.386528	0.431674	0.460928	0.463385	0.406906	0.376670
Q84	0.471897	0.497826	0.506630	0.525132	0.398990	0.394588
Q85	0.215069	0.246576	0.244794	0.319366	0.235225	0.220844
Q86	0.236018	0.251998	0.306239	0.347843	0.332047	0.253779
Q87	0.411655	0.442742	0.412829	0.471091	0.343826	0.378439
Q88	0.429312	0.458925	0.432284	0.492822	0.401508	0.363128
Q89	0.375929	0.401566	0.416786	0.495971	0.396499	0.339942
	Q8	Q9	Q10	Q11	Q12	Q13
Q55	0.357747	0.346790	0.379870	0.359303	0.347829	0.381888
Q56	0.316584	0.322568	0.361290	0.345898	0.291602	0.349942
Q57	0.375361	0.354399	0.402384	0.377649	0.328455	0.411135
Q58	0.362177	0.349551	0.382206	0.371982	0.323261	0.399719
Q59	0.370622	0.373160	0.393807	0.365992	0.336132	0.404730
Q60	0.345989	0.336989	0.374604	0.353174	0.327428	0.380931
Q61	0.392843	0.388501	0.416301	0.416130	0.344661	0.418361
Q62	0.322307	0.322618	0.328120	0.333763	0.270120	0.332805
Q63	0.359145	0.342370	0.371294	0.367303	0.315358	0.372438

Q64	0.292964	0.310288	0.316769	0.335507	0.281697	0.326519
Q65	0.296971	0.304493	0.326460	0.342289	0.281191	0.341722
Q66	0.309182	0.338832	0.322829	0.353813	0.300062	0.358126
Q73	0.418286	0.385977	0.420214	0.390774	0.389936	0.429111
Q74	0.576016	0.563439	0.609839	0.627194	0.484658	0.627003
Q75	0.417241	0.400064	0.448407	0.418946	0.376961	0.450749
Q76	0.400904	0.392468	0.432551	0.409831	0.387470	0.441728
Q77	0.220000	0.217485	0.263804	0.260901	0.200526	0.262909
Q78	0.345613	0.342970	0.406574	0.403225	0.327096	0.421477
Q79	0.372713	0.357477	0.395541	0.400034	0.369107	0.429961
Q80	0.355696	0.356658	0.366888	0.413043	0.331564	0.410171
Q81	0.424013	0.387115	0.441972	0.430301	0.374365	0.455345
Q82	0.392180	0.372709	0.417828	0.414792	0.347895	0.430017
Q83	0.393311	0.378472	0.407924	0.411424	0.342837	0.430053
Q84	0.428803	0.402954	0.442343	0.430170	0.393797	0.455518
Q85	0.225236	0.243854	0.236101	0.260996	0.184228	0.249829
Q86	0.216772	0.214537	0.245688	0.293448	0.168755	0.262120
Q87	0.406233	0.380728	0.425786	0.385808	0.368163	0.410773
Q88	0.366054	0.359193	0.413857	0.363907	0.329259	0.376261
Q89	0.333445	0.349946	0.367472	0.374424	0.285753	0.384102
	Q14	Q15	Q16	Q17	Q18	Q19
Q55	0.449310	0.389840	0.406794	0.379788	0.448426	0.437254
Q56	0.398807	0.363444	0.406159	0.386433	0.430784	0.413930
Q57	0.441741	0.393767	0.430407	0.382669	0.424238	0.411424
Q58	0.422975	0.386246	0.454933	0.403909	0.462741	0.443623
Q59	0.432047	0.374461	0.395682	0.375739	0.426472	0.429623
Q60	0.419922	0.399046	0.398689	0.368794	0.429913	0.453935
Q61	0.468175	0.448891	0.423290	0.401328	0.432507	0.448303
Q62	0.390476	0.366147	0.358674	0.321906	0.383563	0.389871
Q63	0.426778	0.401318	0.417759	0.375356	0.425291	0.419530
Q64	0.361940	0.310908	0.376530	0.333713	0.360332	0.353084
Q65	0.385369	0.344636	0.390537	0.316288	0.398928	0.386787
Q66	0.394350	0.378305	0.383997	0.334604	0.388561	0.384821
Q73	0.494092	0.405449	0.424875	0.317398	0.397716	0.404698
Q74	0.601692	0.394822	0.367069	0.310505	0.343082	0.385497
Q75	0.497173	0.465947	0.450299	0.378799	0.443291	0.424756
Q76	0.460826	0.388487	0.392778	0.309433	0.380593	0.379088
Q77	0.287891	0.268803	0.299445	0.252401	0.346941	0.283488
Q78	0.433094	0.354561	0.428483	0.347345	0.419172	0.387095
Q79	0.461052	0.374224	0.411430	0.336298	0.440877	0.435842
Q80	0.455486	0.369303	0.417376	0.372920	0.436837	0.414298
Q81	0.483700	0.372142	0.458164	0.375429	0.402947	0.381806
Q82	0.452458	0.348345	0.433487	0.374124	0.410828	0.379379
Q83	0.465855	0.388586	0.402006	0.359461	0.409698	0.406863
Q84	0.489651	0.383675	0.428735	0.329208	0.431314	0.403358
Q85	0.318523	0.288099	0.322040	0.286806	0.302415	0.272631
Q86	0.298955	0.282784	0.291542	0.302801	0.282169	0.234761
Q87	0.482012	0.415116	0.451282	0.346230	0.421988	0.443653
Q88	0.456903	0.332856	0.412110	0.319253	0.374720	0.363699
Q89	0.429137	0.363740	0.434656	0.343202	0.422915	0.380744

	Q20	Q21	Q22	Q23	Q24	Q25
Q55	0.458195	0.365951	0.562846	0.403753	0.485285	0.517133
Q56	0.441066	0.358188	0.514568	0.423664	0.488510	0.513908
Q57	0.437303	0.397416	0.490071	0.401035	0.470241	0.529406
Q58	0.466145	0.401552	0.541948	0.451185	0.522095	0.545196
Q59	0.462398	0.417049	0.521410	0.412939	0.513520	0.542013
Q60	0.429886	0.418562	0.527754	0.428193	0.458429	0.495726
Q61	0.452339	0.434893	0.473109	0.397015	0.479383	0.522911
Q62	0.398122	0.368737	0.441515	0.354876	0.439003	0.452132
Q63	0.439711	0.397075	0.482677	0.377071	0.461375	0.483147
Q64	0.407961	0.376130	0.425772	0.361195	0.412552	0.441778
Q65	0.434847	0.356906	0.451091	0.389136	0.459761	0.475890
Q66	0.418406	0.386610	0.436063	0.364079	0.428041	0.470638
Q73	0.418941	0.333721	0.496318	0.383594	0.474348	0.496387
Q74	0.351358	0.310388	0.420471	0.372842	0.376675	0.414990
Q75	0.440526	0.361397	0.512320	0.437224	0.511887	0.528860
Q76	0.429434	0.363429	0.469725	0.350773	0.485575	0.515616
Q77	0.311694	0.300418	0.318584	0.302580	0.338401	0.351496
Q78	0.437663	0.373518	0.434901	0.412927	0.482201	0.511861
Q79	0.475002	0.374493	0.509481	0.408029	0.496778	0.512746
Q80	0.446588	0.396572	0.459178	0.392692	0.465346	0.470456
Q81	0.454479	0.378040	0.468654	0.397135	0.493477	0.527901
Q82	0.405860	0.340160	0.463090	0.400244	0.476477	0.502300
Q83	0.411235	0.400779	0.459802	0.399837	0.473834	0.508485
Q84	0.423241	0.372993	0.500194	0.383179	0.507601	0.535280
Q85	0.321293	0.271912	0.331383	0.291428	0.311731	0.310576
Q86	0.303834	0.304576	0.265841	0.300832	0.297485	0.310768
Q87	0.431470	0.365904	0.517796	0.403142	0.480412	0.514612
Q88	0.408596	0.346647	0.484041	0.379763	0.467502	0.492088
Q89	0.415341	0.396517	0.457820	0.400260	0.504769	0.532198
	Q26	Q27	Q28	Q29	Q30	Q31
Q55	0.613696	0.652978	0.645225	0.676974	0.665996	0.610332
Q56	0.617973	0.592720	0.644930	0.648835	0.604627	0.593066
Q57	0.591250	0.568914	0.607111	0.642927	0.609630	0.552973
Q58	0.679486	0.640154	0.644658	0.665223	0.647885	0.619996
Q59	0.643590	0.639494	0.618491	0.640212	0.634974	0.623141
Q60	0.609961	0.624532	0.611766	0.639993	0.603452	0.615364
Q61	0.615434	0.598932	0.629970	0.644787	0.588733	0.568689
Q62	0.577484	0.561556	0.547251	0.566233	0.558390	0.532644
Q63	0.618001	0.597904	0.586440	0.622152	0.584146	0.553952
Q64	0.561332	0.520169	0.529439	0.544915	0.538473	0.502131
Q65	0.544613	0.548442	0.566471	0.539647	0.530336	0.526648
Q66	0.541544	0.543602	0.557654	0.567639	0.539622	0.519624
Q73	0.596504	0.609992	0.584904	0.585930	0.573378	0.576617
Q74	0.511084	0.507379	0.498032	0.495915	0.525115	0.488329
Q75	0.616220	0.633567	0.606597	0.667159	0.595068	0.585454
Q76	0.561952	0.621804	0.603707	0.595823	0.590345	0.557432
Q77	0.445743	0.397818	0.422937	0.444287	0.430789	0.387281
Q78	0.603961	0.591262	0.602867	0.627623	0.571084	0.554004
Q79	0.604353	0.596887	0.599532	0.616993	0.595180	0.573875

Q80	0.578548	0.571591	0.582844	0.580095	0.574484	0.561432
Q81	0.611430	0.615356	0.607400	0.640472	0.600835	0.590864
Q82	0.603140	0.602232	0.580913	0.600917	0.576166	0.562017
Q83	0.610478	0.580019	0.600831	0.633758	0.582419	0.564899
Q84	0.616728	0.631894	0.606704	0.648054	0.589622	0.568666
Q85	0.418666	0.425457	0.384006	0.424924	0.395146	0.375242
Q86	0.436783	0.350643	0.367619	0.431122	0.398951	0.344763
Q87	0.610176	0.624856	0.630113	0.659088	0.596932	0.579972
Q88	0.579528	0.620422	0.584323	0.636424	0.570961	0.547285
Q89	0.590364	0.574298	0.563301	0.594521	0.568038	0.541206
	Q32	Q33	Q34	Q35	Q36	Q37
Q55	0.629003	0.636603	0.628723	0.640043	0.630694	0.635997
Q56	0.590088	0.591270	0.587820	0.626685	0.604021	0.597316
Q57	0.536896	0.567269	0.525895	0.564192	0.584789	0.583461
Q58	0.593035	0.625432	0.607501	0.629758	0.604321	0.605469
Q59	0.581505	0.615958	0.627176	0.628850	0.583731	0.586349
Q60	0.562108	0.596920	0.613559	0.626719	0.551782	0.568676
Q61	0.538778	0.574058	0.577276	0.583774	0.560840	0.579124
Q62	0.532316	0.548291	0.566023	0.579213	0.517758	0.536412
Q63	0.537873	0.563464	0.567576	0.603658	0.590312	0.603252
Q64	0.458977	0.485447	0.499164	0.511954	0.480627	0.487303
Q65	0.535208	0.510569	0.541927	0.557301	0.507421	0.540442
Q66	0.509479	0.519082	0.516050	0.535591	0.573322	0.583725
Q73	0.562192	0.571682	0.552270	0.587936	0.583129	0.555971
Q74	0.475958	0.488367	0.460119	0.505057	0.495244	0.505309
Q75	0.566059	0.578863	0.567810	0.612084	0.613347	0.619858
Q76	0.573659	0.561239	0.549094	0.560323	0.666160	0.657057
Q77	0.363206	0.370447	0.404756	0.445225	0.447767	0.464065
Q78	0.504646	0.522682	0.511411	0.531884	0.607587	0.609241
Q79	0.557708	0.555514	0.564132	0.579310	0.605192	0.616647
Q80	0.541012	0.562369	0.555058	0.577138	0.581342	0.602989
Q81	0.541290	0.589474	0.544938	0.574982	0.602473	0.628328
Q82	0.503473	0.529690	0.527087	0.550061	0.569236	0.574067
Q83	0.511509	0.556363	0.551185	0.561911	0.576993	0.607657
Q84	0.538530	0.552209	0.569260	0.590720	0.628316	0.633578
Q85	0.370712	0.389388	0.402520	0.417153	0.420813	0.435786
Q86	0.265475	0.329810	0.322421	0.349667	0.374224	0.382426
Q87	0.548459	0.575525	0.573496	0.586864	0.591905	0.601346
Q88	0.547524	0.558894	0.563788	0.609258	0.596351	0.611907
Q89	0.478911	0.515172	0.508474	0.549677	0.544147	0.547976
	Q38	Q39	Q40	Q41	Q42	Q43
Q55	0.532677	0.564643	0.555936	0.627381	0.564270	0.557164
Q56	0.542721	0.547418	0.545571	0.591633	0.558270	0.547796
Q57	0.520116	0.511712	0.531317	0.570316	0.547249	0.527086
Q58	0.592828	0.587905	0.594061	0.615733	0.581397	0.550612
Q59	0.579664	0.590721	0.587013	0.613653	0.605216	0.564501
Q60	0.525951	0.542742	0.579273	0.580266	0.577326	0.554356
Q61	0.559790	0.550486	0.536406	0.585199	0.549327	0.529015
Q62	0.508630	0.511782	0.531822	0.550249	0.544390	0.524685
Q63	0.523192	0.539932	0.544858	0.565243	0.529341	0.522352

Q64	0.470579	0.478151	0.499304	0.509063	0.505101	0.521010
Q65	0.478789	0.504172	0.525918	0.536165	0.490067	0.503452
Q66	0.457259	0.517176	0.523371	0.540318	0.524194	0.513042
Q73	0.564618	0.556712	0.551117	0.568718	0.497347	0.501970
Q74	0.458387	0.496708	0.469785	0.517132	0.447506	0.441010
Q75	0.558852	0.570376	0.576907	0.606280	0.548413	0.544972
Q76	0.534903	0.614979	0.512826	0.576195	0.501610	0.528234
Q77	0.412504	0.418831	0.418746	0.403527	0.456356	0.430007
Q78	0.543294	0.561241	0.521458	0.557337	0.520710	0.521017
Q79	0.557908	0.595505	0.568788	0.594801	0.575043	0.558414
Q80	0.523108	0.566733	0.551139	0.552931	0.544377	0.546785
Q81	0.533177	0.553846	0.534348	0.577846	0.500104	0.502816
Q82	0.525057	0.528120	0.538942	0.564483	0.480975	0.470031
Q83	0.517805	0.538702	0.553467	0.568195	0.543322	0.504451
Q84	0.565429	0.569227	0.545845	0.600877	0.507405	0.522579
Q85	0.364333	0.379706	0.419988	0.429522	0.407587	0.452236
Q86	0.345298	0.337260	0.371075	0.364079	0.382939	0.351980
Q87	0.531157	0.550817	0.526709	0.604119	0.518094	0.529728
Q88	0.509803	0.532470	0.534160	0.590020	0.467150	0.522712
Q89	0.504855	0.492178	0.528504	0.538230	0.494835	0.473333
	Q44	Q45	Q46	Q47	Q48	Q49
Q55	0.594124	0.602577	0.602044	0.595731	0.593044	0.545394
Q56	0.590427	0.577340	0.651709	0.592766	0.595045	0.565632
Q57	0.582664	0.562559	0.562435	0.478177	0.553772	0.573060
Q58	0.619336	0.626500	0.663451	0.587773	0.590063	0.567407
Q59	0.600856	0.590055	0.636629	0.585185	0.547257	0.546431
Q60	0.595101	0.590191	0.568507	0.533792	0.538920	0.555586
Q61	0.607451	0.577884	0.582108	0.547724	0.544062	0.614927
Q62	0.540192	0.520348	0.649517	0.589663	0.518216	0.518102
Q63	0.560918	0.541176	0.620225	0.545189	0.570024	0.538892
Q64	0.502343	0.453705	0.570185	0.507272	0.527287	0.533203
Q65	0.513779	0.506254	0.608920	0.531811	0.538488	0.556940
Q66	0.515107	0.525427	0.607772	0.542540	0.513748	0.544405
Q73	0.553136	0.600401	0.482843	0.423000	0.500134	0.453962
Q74	0.465048	0.520310	0.390200	0.414448	0.431602	0.385581
Q75	0.599758	0.585169	0.543574	0.477591	0.507532	0.512197
Q76	0.578708	0.600259	0.519730	0.467158	0.493492	0.464799
Q77	0.411301	0.379383	0.490897	0.414717	0.414320	0.443794
Q78	0.566222	0.533128	0.535233	0.426783	0.507787	0.543631
Q79	0.590429	0.568550	0.604232	0.496734	0.518788	0.555022
Q80	0.593773	0.571941	0.564994	0.470678	0.509262	0.540643
Q81	0.586216	0.565090	0.525770	0.473177	0.532132	0.536145
Q82	0.527479	0.552810	0.496727	0.435920	0.518866	0.534106
Q83	0.562393	0.548229	0.534430	0.449811	0.534777	0.576716
Q84	0.599093	0.597842	0.513782	0.467097	0.524147	0.540446
Q85	0.406699	0.401435	0.464884	0.421450	0.375138	0.358388
Q86	0.392310	0.336840	0.433298	0.342099	0.416359	0.461321
Q87	0.576293	0.595469	0.536575	0.469180	0.535687	0.501582
Q88	0.559364	0.566887	0.525802	0.511693	0.491181	0.453914
Q89	0.545450	0.517769	0.536914	0.448335	0.552170	0.535400

	Q50	Q51	Q52	Q53	Q54	Q55
Q55	0.566643	0.554193	0.530956	0.577219	0.639098	1.000000
Q56	0.570467	0.566428	0.558931	0.621611	0.690723	0.792059
Q57	0.571752	0.543831	0.547571	0.590785	0.596835	0.683944
Q58	0.555718	0.555124	0.546469	0.591787	0.650127	0.717171
Q59	0.545917	0.526962	0.493279	0.532809	0.645411	0.669156
Q60	0.547461	0.545701	0.523150	0.559768	0.590265	0.688521
Q61	0.613764	0.600504	0.584316	0.596373	0.614354	0.666650
Q62	0.508297	0.514005	0.525420	0.532307	0.630262	0.608228
Q63	0.530747	0.535806	0.552382	0.584244	0.606157	0.656984
Q64	0.467964	0.493754	0.510026	0.562995	0.614637	0.582000
Q65	0.500972	0.517784	0.499210	0.572250	0.584698	0.619164
Q66	0.537344	0.546925	0.511758	0.556743	0.587424	0.631458
Q73	0.485963	0.466885	0.419756	0.419077	0.478690	0.609177
Q74	0.465944	0.440787	0.373848	0.384363	0.419969	0.504586
Q75	0.536582	0.526997	0.500654	0.525103	0.534043	0.642540
Q76	0.492596	0.484770	0.422728	0.438386	0.493792	0.615831
Q77	0.409254	0.407560	0.384043	0.469211	0.476048	0.442853
Q78	0.547818	0.545344	0.504654	0.524103	0.524295	0.585790
Q79	0.562630	0.558399	0.502333	0.561414	0.582911	0.648072
Q80	0.559815	0.563976	0.502505	0.539695	0.554311	0.614363
Q81	0.546752	0.535813	0.471618	0.518762	0.535961	0.618503
Q82	0.548138	0.535147	0.493553	0.489300	0.486638	0.570222
Q83	0.592813	0.586329	0.546134	0.545261	0.541504	0.599117
Q84	0.529225	0.503794	0.458913	0.476067	0.509446	0.615482
Q85	0.383069	0.387722	0.379065	0.455521	0.449444	0.455807
Q86	0.437487	0.440590	0.438540	0.481996	0.431761	0.396335
Q87	0.528719	0.521398	0.490167	0.541416	0.540162	0.643399
Q88	0.457939	0.454948	0.445469	0.472247	0.510098	0.624063
Q89	0.535295	0.525016	0.503507	0.560335	0.538432	0.586527
	Q56	Q57	Q58	Q59	Q60	Q61
Q55	0.792059	0.683944	0.717171	0.669156	0.688521	0.666650
Q56	1.000000	0.732202	0.775225	0.681922	0.678369	0.719188
Q57	0.732202	1.000000	0.707985	0.655382	0.634835	0.758250
Q58	0.775225	0.707985	1.000000	0.786442	0.713015	0.725874
Q59	0.681922	0.655382	0.786442	1.000000	0.719081	0.693115
Q60	0.678369	0.634835	0.713015	0.719081	1.000000	0.693981
Q61	0.719188	0.758250	0.725874	0.693115	0.693981	1.000000
Q62	0.664467	0.612227	0.695798	0.659526	0.620649	0.687799
Q63	0.726880	0.704173	0.730444	0.679645	0.679189	0.730239
Q64	0.653244	0.593750	0.650772	0.628508	0.614392	0.637866
Q65	0.673948	0.635335	0.678744	0.648593	0.633076	0.672384
Q66	0.660137	0.672728	0.677337	0.661044	0.595317	0.685757
Q73	0.550763	0.534552	0.608222	0.600059	0.568014	0.550749
Q74	0.449940	0.493539	0.520311	0.535426	0.466053	0.508425
Q75	0.616540	0.652924	0.632751	0.633579	0.607418	0.619530
Q76	0.600859	0.591477	0.621458	0.584914	0.548421	0.587534
Q77	0.492425	0.456493	0.480181	0.472712	0.459984	0.494218
Q78	0.615454	0.620706	0.644840	0.621908	0.565821	0.628099
Q79	0.657175	0.652280	0.690649	0.668716	0.614014	0.641981

Q80	0.633541	0.604143	0.667703	0.638790	0.588491	0.617625
Q81	0.632518	0.669377	0.672786	0.655223	0.592561	0.647029
Q82	0.589909	0.622218	0.658179	0.625600	0.573331	0.606500
Q83	0.617369	0.669350	0.640689	0.661622	0.606782	0.663480
Q84	0.605530	0.636132	0.663836	0.640621	0.592262	0.613493
Q85	0.447910	0.446501	0.473244	0.451593	0.401839	0.427503
Q86	0.454652	0.487776	0.472982	0.449934	0.405945	0.483199
Q87	0.640940	0.627717	0.656606	0.624744	0.622432	0.623930
Q88	0.610410	0.579565	0.623405	0.606346	0.578837	0.560418
Q89	0.621308	0.620498	0.639211	0.596852	0.581906	0.605154
	Q62	Q63	Q64	Q65	Q66	Q73
Q55	0.608228	0.656984	0.582000	0.619164	0.631458	0.609177
Q56	0.664467	0.726880	0.653244	0.673948	0.660137	0.550763
Q57	0.612227	0.704173	0.593750	0.635335	0.672728	0.534552
Q58	0.695798	0.730444	0.650772	0.678744	0.677337	0.608222
Q59	0.659526	0.679645	0.628508	0.648593	0.661044	0.600059
Q60	0.620649	0.679189	0.614392	0.633076	0.595317	0.568014
Q61	0.687799	0.730239	0.637866	0.672384	0.685757	0.550749
Q62	1.000000	0.775467	0.688825	0.688487	0.687497	0.537935
Q63	0.775467	1.000000	0.734216	0.752606	0.750369	0.563309
Q64	0.688825	0.734216	1.000000	0.781073	0.739472	0.505328
Q65	0.688487	0.752606	0.781073	1.000000	0.788089	0.519549
Q66	0.687497	0.750369	0.739472	0.788089	1.000000	0.534396
Q73	0.537935	0.563309	0.505328	0.519549	0.534396	1.000000
Q74	0.459632	0.472463	0.414932	0.408616	0.468424	0.689195
Q75	0.579630	0.626593	0.568659	0.566100	0.611349	0.717468
Q76	0.550829	0.593759	0.532300	0.572878	0.626855	0.682637
Q77	0.483559	0.534901	0.510733	0.531017	0.521438	0.417193
Q78	0.588268	0.661383	0.584828	0.611843	0.651585	0.617738
Q79	0.644829	0.688098	0.609893	0.661762	0.700261	0.620980
Q80	0.591289	0.633241	0.593676	0.617547	0.661985	0.615015
Q81	0.582910	0.643847	0.589610	0.601845	0.642996	0.659303
Q82	0.553366	0.609114	0.552011	0.560003	0.593653	0.630245
Q83	0.604472	0.660818	0.604358	0.613095	0.652461	0.639580
Q84	0.570129	0.623102	0.546865	0.555886	0.606105	0.712786
Q85	0.500809	0.484601	0.468374	0.494227	0.501563	0.429376
Q86	0.453256	0.490522	0.510118	0.496202	0.516189	0.372977
Q87	0.608217	0.647698	0.552969	0.578285	0.594765	0.645890
Q88	0.541721	0.597950	0.561342	0.557410	0.576610	0.646112
Q89	0.600009	0.639225	0.613804	0.600329	0.628044	0.593657
	Q74	Q75	Q76	Q77	Q78	Q79
Q55	0.504586	0.642540	0.615831	0.442853	0.585790	0.648072
Q56	0.449940	0.616540	0.600859	0.492425	0.615454	0.657175
Q57	0.493539	0.652924	0.591477	0.456493	0.620706	0.652280
Q58	0.520311	0.632751	0.621458	0.480181	0.644840	0.690649
Q59	0.535426	0.633579	0.584914	0.472712	0.621908	0.668716
Q60	0.466053	0.607418	0.548421	0.459984	0.565821	0.614014
Q61	0.508425	0.619530	0.587534	0.494218	0.628099	0.641981
Q62	0.459632	0.579630	0.550829	0.483559	0.588268	0.644829
Q63	0.472463	0.626593	0.593759	0.534901	0.661383	0.688098

Q64	0.414932	0.568659	0.532300	0.510733	0.584828	0.609893
Q65	0.408616	0.566100	0.572878	0.531017	0.611843	0.661762
Q66	0.468424	0.611349	0.626855	0.521438	0.651585	0.700261
Q73	0.689195	0.717468	0.682637	0.417193	0.617738	0.620980
Q74	1.000000	0.638942	0.587883	0.374157	0.543319	0.545668
Q75	0.638942	1.000000	0.718608	0.502995	0.707690	0.722000
Q76	0.587883	0.718608	1.000000	0.503271	0.764214	0.741314
Q77	0.374157	0.502995	0.503271	1.000000	0.620575	0.629330
Q78	0.543319	0.707690	0.764214	0.620575	1.000000	0.813293
Q79	0.545668	0.722000	0.741314	0.629330	0.813293	1.000000
Q80	0.568009	0.677681	0.719904	0.583742	0.786130	0.817614
Q81	0.591184	0.765244	0.750055	0.497237	0.789384	0.770095
Q82	0.563269	0.715904	0.679248	0.470286	0.755388	0.716972
Q83	0.579673	0.722098	0.689839	0.554887	0.761762	0.758906
Q84	0.601937	0.746319	0.731957	0.456681	0.719920	0.723842
Q85	0.388889	0.541328	0.463887	0.389216	0.500808	0.518902
Q86	0.353135	0.490570	0.421871	0.438333	0.551322	0.522550
Q87	0.537240	0.696165	0.647372	0.476223	0.684415	0.697289
Q88	0.516307	0.752064	0.677900	0.463334	0.657401	0.671720
Q89	0.494916	0.682730	0.661973	0.525099	0.724712	0.695145
	Q80	Q81	Q82	Q83	Q84	Q85
Q55	0.614363	0.618503	0.570222	0.599117	0.615482	0.455807
Q56	0.633541	0.632518	0.589909	0.617369	0.605530	0.447910
Q57	0.604143	0.669377	0.622218	0.669350	0.636132	0.446501
Q58	0.667703	0.672786	0.658179	0.640689	0.663836	0.473244
Q59	0.638790	0.655223	0.625600	0.661622	0.640621	0.451593
Q60	0.588491	0.592561	0.573331	0.606782	0.592262	0.401839
Q61	0.617625	0.647029	0.606500	0.663480	0.613493	0.427503
Q62	0.591289	0.582910	0.553366	0.604472	0.570129	0.500809
Q63	0.633241	0.643847	0.609114	0.660818	0.623102	0.484601
Q64	0.593676	0.589610	0.552011	0.604358	0.546865	0.468374
Q65	0.617547	0.601845	0.560003	0.613095	0.555886	0.494227
Q66	0.661985	0.642996	0.593653	0.652461	0.606105	0.501563
Q73	0.615015	0.659303	0.630245	0.639580	0.712786	0.429376
Q74	0.568009	0.591184	0.563269	0.579673	0.601937	0.388889
Q75	0.677681	0.765244	0.715904	0.722098	0.746319	0.541328
Q76	0.719904	0.750055	0.679248	0.689839	0.731957	0.463887
Q77	0.583742	0.497237	0.470286	0.554887	0.456681	0.389216
Q78	0.786130	0.789384	0.755388	0.761762	0.719920	0.500808
Q79	0.817614	0.770095	0.716972	0.758906	0.723842	0.518902
Q80	1.000000	0.766221	0.716247	0.745439	0.680298	0.490582
Q81	0.766221	1.000000	0.812793	0.807243	0.772600	0.474544
Q82	0.716247	0.812793	1.000000	0.782430	0.738641	0.463868
Q83	0.745439	0.807243	0.782430	1.000000	0.742319	0.526199
Q84	0.680298	0.772600	0.738641	0.742319	1.000000	0.526327
Q85	0.490582	0.474544	0.463868	0.526199	0.526327	1.000000
Q86	0.520314	0.522260	0.532747	0.597075	0.528216	0.585845
Q87	0.656044	0.707884	0.665618	0.689373	0.746490	0.600498
Q88	0.644421	0.705048	0.666598	0.668557	0.801847	0.608115
Q89	0.672984	0.712162	0.711675	0.739053	0.773263	0.604315

	Q86	Q87	Q88	Q89
Q55	0.396335	0.643399	0.624063	0.586527
Q56	0.454652	0.640940	0.610410	0.621308
Q57	0.487776	0.627717	0.579565	0.620498
Q58	0.472982	0.656606	0.623405	0.639211
Q59	0.449934	0.624744	0.606346	0.596852
Q60	0.405945	0.622432	0.578837	0.581906
Q61	0.483199	0.623930	0.560418	0.605154
Q62	0.453256	0.608217	0.541721	0.600009
Q63	0.490522	0.647698	0.597950	0.639225
Q64	0.510118	0.552969	0.561342	0.613804
Q65	0.496202	0.578285	0.557410	0.600329
Q66	0.516189	0.594765	0.576610	0.628044
Q73	0.372977	0.645890	0.646112	0.593657
Q74	0.353135	0.537240	0.516307	0.494916
Q75	0.490570	0.696165	0.752064	0.682730
Q76	0.421871	0.647372	0.677900	0.661973
Q77	0.438333	0.476223	0.463334	0.525099
Q78	0.551322	0.684415	0.657401	0.724712
Q79	0.522550	0.697289	0.671720	0.695145
Q80	0.520314	0.656044	0.644421	0.672984
Q81	0.522260	0.707884	0.705048	0.712162
Q82	0.532747	0.665618	0.666598	0.711675
Q83	0.597075	0.689373	0.668557	0.739053
Q84	0.528216	0.746490	0.801847	0.773263
Q85	0.585845	0.600498	0.608115	0.604315
Q86	1.000000	0.575791	0.535972	0.658088
Q87	0.575791	1.000000	0.744981	0.749166
Q88	0.535972	0.744981	1.000000	0.752747
Q89	0.658088	0.749166	0.752747	1.000000

APPENDIX D: Main Study Descriptive Statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Q2	790	1.00	5.00	3.9506	.94398	-1.007	.087	1.098	.174
Q3	790	1.00	5.00	3.8190	.92775	-.750	.087	.466	.174
Q4	790	1.00	5.00	3.6038	1.03610	-.536	.087	-.181	.174
Q5	790	1.00	5.00	3.5570	1.05905	-.557	.087	-.157	.174
Q6	790	1.00	5.00	3.4494	1.08538	-.373	.087	-.521	.174
Q7	790	1.00	5.00	3.7443	1.15709	-.755	.087	-.207	.174
Q8	790	1.00	5.00	3.9127	1.17266	-1.012	.087	.242	.174
Q9	790	1.00	5.00	3.9114	1.14245	-1.053	.087	.459	.174
Q10	790	1.00	5.00	3.7797	1.14460	-.822	.087	-.039	.174
Q11	790	1.00	5.00	3.6418	1.20709	-.642	.087	-.469	.174
Q12	790	1.00	5.00	4.0013	1.07807	-1.067	.087	.618	.174
Q13	790	1.00	5.00	3.6532	1.19620	-.634	.087	-.449	.174
Q14	790	1.00	5.00	3.8139	1.10055	-.822	.087	.110	.174
Q15	790	1.00	5.00	3.7038	.99980	-.685	.087	.243	.174
Q16	790	1.00	5.00	3.7278	.98047	-.655	.087	.149	.174
Q17	790	1.00	5.00	3.3797	1.02694	-.318	.087	-.369	.174
Q18	790	1.00	5.00	3.7696	.94866	-.696	.087	.370	.174
Q19	790	1.00	5.00	3.6722	.98409	-.610	.087	.157	.174
Q20	790	1.00	5.00	3.6734	.90607	-.529	.087	.240	.174
Q21	790	1.00	5.00	3.4329	.97623	-.422	.087	-.012	.174
Q22	790	1.00	5.00	3.8494	.87717	-.742	.087	.907	.174
Q23	790	1.00	5.00	3.4430	.99996	-.319	.087	-.317	.174
Q24	790	1.00	5.00	3.8633	.93464	-.733	.087	.457	.174
Q25	790	1.00	5.00	3.8051	.95393	-.691	.087	.318	.174
Q26	790	1.00	5.00	3.6924	.91755	-.666	.087	.600	.174
Q27	790	1.00	5.00	3.8937	.88292	-.777	.087	.736	.174
Q28	790	1.00	5.00	3.8430	.93145	-.749	.087	.577	.174
Q29	790	1.00	5.00	3.7797	.96693	-.737	.087	.375	.174
Q30	790	1.00	5.00	3.7797	.96430	-.687	.087	.299	.174
Q31	790	1.00	5.00	3.7620	.95611	-.634	.087	.209	.174
Q32	790	1.00	5.00	3.9671	.91401	-.893	.087	.914	.174
Q33	790	1.00	5.00	3.8911	.95967	-.808	.087	.487	.174
Q34	790	1.00	5.00	3.9835	.93569	-.907	.087	.733	.174
Q35	790	1.00	5.00	3.9380	.92285	-.856	.087	.813	.174
Q36	790	1.00	5.00	4.0253	1.03150	-1.100	.087	.897	.174
Q37	790	1.00	5.00	4.0000	1.01946	-1.072	.087	.923	.174
Q38	790	1.00	5.00	4.0089	.87127	-.870	.087	.957	.174
Q39	790	1.00	5.00	4.0152	.83629	-.745	.087	.769	.174

Descriptive Statistics (Continued)

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Q40	790	1.00	5.00	3.8899	.89882	-.653	.087	.401	.174
Q41	790	1.00	5.00	4.0152	.89061	-.872	.087	.899	.174
Q42	790	1.00	5.00	3.8481	.95777	-.664	.087	.197	.174
Q43	790	1.00	5.00	3.9506	.94129	-.807	.087	.461	.174
Q44	790	1.00	5.00	3.9481	.90826	-.732	.087	.458	.174
Q45	790	1.00	5.00	4.0532	.89624	-.962	.087	1.140	.174
Q46	790	1.00	5.00	3.8114	.94922	-.730	.087	.556	.174
Q47	790	1.00	5.00	4.1797	.89957	-1.209	.087	1.657	.174
Q48	790	1.00	5.00	3.7215	.99475	-.721	.087	.395	.174
Q49	790	1.00	5.00	3.5051	1.10045	-.439	.087	-.370	.174
Q50	790	1.00	5.00	3.5101	1.07596	-.565	.087	-.163	.174
Q51	790	1.00	5.00	3.4430	1.09784	-.500	.087	-.309	.174
Q52	790	1.00	5.00	3.4468	1.07587	-.447	.087	-.259	.174
Q53	790	1.00	5.00	3.4177	1.05739	-.476	.087	-.232	.174
Q54	790	1.00	5.00	3.7709	.99015	-.809	.087	.516	.174
Q55	790	1.00	5.00	4.0203	.92266	-1.011	.087	1.220	.174
Q56	790	1.00	5.00	3.9089	.97200	-1.004	.087	1.084	.174
Q57	790	1.00	5.00	3.6772	1.12506	-.690	.087	-.141	.174
Q58	790	1.00	5.00	3.7684	.96097	-.820	.087	.714	.174
Q59	790	1.00	5.00	3.8380	.94141	-.833	.087	.740	.174
Q60	790	1.00	5.00	3.8367	.92695	-.714	.087	.555	.174
Q61	790	1.00	5.00	3.7190	1.00039	-.717	.087	.286	.174
Q62	790	1.00	5.00	3.7443	.98038	-.627	.087	.137	.174
Q63	790	1.00	5.00	3.6962	1.02633	-.699	.087	.210	.174
Q64	790	1.00	5.00	3.5899	.99499	-.532	.087	.088	.174
Q65	790	1.00	5.00	3.7101	.97537	-.692	.087	.363	.174
Q66	790	1.00	5.00	3.6557	1.06705	-.661	.087	.062	.174
Q73	790	1.00	5.00	4.0506	1.02192	-1.109	.087	.902	.174
Q74	790	1.00	5.00	3.9759	1.03827	-.980	.087	.559	.174
Q75	790	1.00	5.00	3.8684	1.06702	-.916	.087	.414	.174
Q76	790	1.00	5.00	3.9418	1.11068	-.970	.087	.296	.174
Q77	790	1.00	5.00	3.6038	1.25110	-.663	.087	-.467	.174
Q78	790	1.00	5.00	3.5392	1.17336	-.583	.087	-.405	.174
Q79	790	1.00	5.00	3.6937	1.11895	-.752	.087	-.021	.174
Q80	790	1.00	5.00	3.6519	1.09687	-.751	.087	.091	.174
Q81	790	1.00	5.00	3.6595	1.20697	-.741	.087	-.278	.174
Q82	790	1.00	5.00	3.5051	1.24526	-.547	.087	-.620	.174
Q83	790	1.00	5.00	3.5165	1.16415	-.571	.087	-.329	.174
Q84	790	1.00	5.00	3.7456	1.20090	-.804	.087	-.203	.174

Q85	790	1.00	5.00	3.5785	1.18964	-.617	.087	-.421	.174
Q86	790	1.00	5.00	2.9418	1.26136	-.050	.087	-1.006	.174
Q87	790	1.00	5.00	3.7532	1.04818	-.725	.087	.131	.174
Q88	790	1.00	5.00	3.7949	1.15403	-.774	.087	-.142	.174
Q89	790	1.00	5.00	3.4228	1.21607	-.496	.087	-.590	.174
Valid N	790								

Observations farthest from the centroid (Mahalanobis distance)

Observation number	Mahalanobis d-squared	p1	p2
375	273.043	.000	.000
351	250.764	.000	.000
622	246.867	.000	.000
567	233.446	.000	.000
264	233.091	.000	.000
319	231.208	.000	.000
206	224.911	.000	.000
343	218.317	.000	.000
481	217.721	.000	.000
655	217.101	.000	.000
623	215.014	.000	.000
403	210.636	.000	.000
520	210.271	.000	.000
701	208.817	.000	.000
218	205.039	.000	.000
455	205.035	.000	.000
713	203.580	.000	.000
298	202.391	.000	.000
524	196.881	.000	.000
669	196.284	.000	.000
703	196.109	.000	.000
671	194.602	.000	.000
718	192.394	.000	.000
624	192.224	.000	.000
134	191.120	.000	.000
260	190.942	.000	.000
221	189.350	.000	.000
6	186.484	.000	.000
169	186.431	.000	.000
583	183.522	.000	.000
696	182.134	.000	.000
284	180.092	.000	.000
34	177.492	.000	.000
631	176.581	.000	.000
726	176.027	.000	.000

Observation number	Mahalanobis d-squared	p1	p2
529	175.868	.000	.000
723	175.386	.000	.000
585	175.133	.000	.000
724	174.712	.000	.000
761	174.191	.000	.000
133	173.264	.000	.000
187	173.213	.000	.000
213	172.722	.000	.000
342	170.962	.000	.000
352	170.890	.000	.000
171	169.499	.000	.000
484	169.042	.000	.000
490	166.950	.000	.000
784	166.566	.000	.000
740	165.242	.000	.000
250	162.316	.000	.000
652	162.210	.000	.000
706	161.652	.000	.000
654	160.738	.000	.000
760	160.197	.000	.000
521	160.147	.000	.000
467	158.493	.000	.000
371	158.177	.000	.000
373	157.989	.000	.000
580	157.946	.000	.000
11	157.398	.000	.000
370	156.022	.000	.000
261	155.222	.000	.000
99	155.209	.000	.000
162	153.639	.000	.000
675	152.894	.000	.000
106	152.877	.000	.000
653	152.538	.000	.000
640	151.454	.000	.000
753	149.865	.000	.000
684	149.644	.000	.000
579	149.512	.000	.000

Observation number	Mahalanobis d-squared	p1	p2
711	148.954	.000	.000
101	148.333	.000	.000
632	148.133	.000	.000
304	147.186	.000	.000
785	146.758	.000	.000
735	146.588	.000	.000
278	145.403	.000	.000
131	145.397	.000	.000
638	145.361	.000	.000
578	145.184	.000	.000
769	144.252	.000	.000
390	143.438	.000	.000
427	143.286	.000	.000
525	143.203	.000	.000
560	142.616	.000	.000
317	142.555	.000	.000
167	142.148	.000	.000
552	140.748	.000	.000
437	139.966	.000	.000
555	139.717	.000	.000
716	138.862	.000	.000
712	138.235	.000	.000
86	136.967	.000	.000
644	136.766	.000	.000
449	136.627	.000	.000
220	136.533	.000	.000
790	136.265	.000	.000
64	135.715	.000	.000

VITA

M. Meral Anıtsal was born in İstanbul, Turkey in 1962. She received a B.S. in Chemical Engineering (third highest overall GPA) from Boğaziçi University and an MBA (overall GPA of 4.0/4.0) from the University of West Georgia. In March of 2007, she completed the requirements for the Ph.D. in Business Administration with a major in Marketing and a minor in Communications / Advertising at The University of Tennessee, Knoxville. Her dissertation is about an application of the means-end theory: measurement of delivery and consumption of an educational service.

She has an extensive business experience. She had worked for a number of national and global incorporations such as J. Walter Thompson; Turkcell Inc.; Toprak Health Care Products Co; Evyap Soap, Oil, Glycerin Inc.; Procter & Gamble Consumer Products Inc.; Toprak Ceramic and Building Materials Marketing Inc.; and Hektaş Agricultural Products Inc. The numerous positions she had held include Strategic Planner, Marketing Manager, International Brand Manager, Technical Coordinator, Technical Brand Manager, Product Manager and Project Engineer.

She has been working as an Assistant Professor of Marketing at Tennessee Tech University since August 2006. She had previously worked as an Assistant Professor of Marketing at the University of West Georgia. She had also taught as Graduate Teaching Associate at The University of Tennessee, Knoxville. She has

taught Principles of Marketing, Marketing Management, Business Research, Marketing Research, Market Analysis and Marketing Strategy, Consumer Behavior, Customer Value Analysis and International Strategic Corporate Management since 2001.

Her research program integrates customer value, services marketing (new product/service development) and diffusion of innovations. Specifically, it focuses on the role of customer value concept on the adoption process of new services and products (e.g. customer value change before and after the implementation stage of innovation decision process from customers' point of view) and on new service design, strategy development and implementation from service providers' point of view.