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EXAMINING THE DISSEMINATION OF INNOVATIONS
IN THE SPORTING GOODS INDUSTRY

By

Marion E. Hambrick
B.A., Transylvania University, 1995
M.B.A., University of Kentucky, 1996

A Dissertation
Submitted to the Faculty of the
Graduate School of the University of Louisville
in Partial Fulfillment of the Requirements
for the Degree of

Doctor of Philosophy

College of Education and Human Development
University of Louisville
Louisville, Kentucky

May 2010

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A Dissertation Approved on

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ABSTRACT

EXAMINING THE DISSEMINATION OF INNOVATIONS IN THE SPORTING GOODS INDUSTRY

Marion E. Hambrick

January 22, 2010

US consumers spend \$87 million annually on sporting goods and services (National Sporting Goods Association, 2008). Each year sporting goods manufacturers also spend millions of dollars creating innovative products for consumers looking to improve their playing performances and enjoyment of the sport (Reisinger, 2002). Manufacturers want to receive adequate returns on their research and development investments and create innovations consumers support and want to buy (Berman & McLaughlin, 1973). To facilitate the dissemination of innovations, manufacturers provide information about their innovations to increase product awareness and help consumers make informed purchasing decisions (Rogers, 2003).

The purpose of the current study was to examine the role of communication in the dissemination of innovations. The study focused on linkages as the vehicles through which information about innovations is spread. A series of two-way factorial ANOVAs was used to examine three linkage types--relational, operational, and technological--and their individual and combined effects on the dissemination of innovations, operationalized as product involvement and purchase intentions. The study also explored innovation type, whether an innovation as a good or service had an effect on an

individual's decision to learn more about or purchase an innovation. Finally, the study examined the roles of sport commitment and club commitment, assessing the effects of an individual's commitment to a sport or to a sports club on the dissemination process.

The results revealed (a) linkage type alone did not influence product involvement or purchase intentions, (b) innovation type influenced purchase intentions, (c) commitment affected which linkage type was most effective in influencing purchase intentions, and (d) commitment alone influenced product involvement and purchase intentions. Sport commitment and club commitment proved critical to the dissemination of innovations. Club members with higher levels of both commitment types expressed greater interest in learning about and purchasing innovations. Innovation type had an effect as club members expressed greater interest in purchasing the good versus the service.

TABLE OF CONTENTS

	PAGE
ACKNOWLEDGEMENTS.....	iii
ABSTRACT.....	v
LIST OF TABLES.....	x
LIST OF FIGURES.....	xi
 INTRODUCTION.....	 1
Problem Statement.....	2
Innovation.....	4
Systems Theory.....	4
Linkages.....	5
Sport Commitment and Club Commitment.....	7
Product Involvement and Purchase Intentions.....	8
Research Purpose.....	8
Research Questions.....	9
Study Significance.....	12
Cycling and the Sporting Goods Industry.....	15
Delimitations.....	16
Limitations.....	18
Organization of the Dissertation.....	20
Definitions.....	21
 LITERATURE REVIEW.....	 23
Innovation.....	23
Diffusion of Innovations.....	29
Systems Theory.....	32
Resource Dependency	35
Linkages Conceptual Framework.....	36
Relational Linkages.....	37
Operational Linkages.....	42
Technological Linkages.....	45
Commitment.....	49
Sport Commitment.....	50
Club Commitment.....	53
Product Involvement.....	55
Purchase Intentions.....	59
Summary of Literature.....	60

METHOD.....	62
Research Purpose.....	62
Research Questions and Hypotheses.....	63
Study Participants.....	65
Sampling.....	68
Qualitative Design and Analysis.....	70
Quantitative Design and Analysis.....	74
Scenarios.....	74
Sport Commitment.....	78
Club Commitment.....	84
Product Involvement.....	88
Purchase Intentions.....	92
Demographic Information.....	94
Construct Validity.....	94
Field Test.....	95
Manipulation Checks.....	96
Data Collection Process.....	98
Paper Surveys.....	98
Online Surveys.....	100
Quantitative Data Analysis.....	103
Factor Analysis.....	103
Analysis of Variance (ANOVA).....	105
RESULTS.....	107
Sample Size.....	107
Respondents.....	108
Female Versus Male Responders.....	109
Early Versus Late Responders.....	109
Paper Versus Online Surveys.....	111
Survey Instrument.....	112
Internal Consistency Reliability Analysis.....	112
Factor Analysis.....	113
Manipulation Checks.....	117
Procedures.....	119
Descriptive Statistics.....	120
Sport Commitment.....	120
Club Commitment.....	120
Product Involvement.....	122
Purchase Intentions.....	123
ANOVA Assumptions.....	124
Analysis of Variance (ANOVA).....	124
DISCUSSION.....	141
Introduction.....	141
Results Summary.....	143
Major Theoretical Implications.....	145

Linkage Type.....	146
Linkage Type and Innovation Type.....	146
Linkage Type and Commitment.....	148
Major Practical Findings.....	152
Future Research.....	166
Limitations.....	173
Summary of the Study.....	174
REFERENCES.....	176
APPENDIX A: SURVEY LETTER	194
APPENDIX B: SURVEYS	196
CURRICULUM VITAE	208

LIST OF TABLES

TABLE	PAGE
1. Correlation Matrix.....	115
2. Survey Scenario Frequencies.....	120
3. Factorial ANOVA: Linkage Type and Innovation on Product Involvement.....	128
4. Factorial ANOVA: Linkage Type and Innovation on Purchase Intentions.....	128
5. Standard Deviations and Means for Linkage Type and Innovation.....	129
6. Factorial ANOVA: Linkage Type and Innovation on Product Involvement.....	134
7. Factorial ANOVA: Linkage Type and Innovation on Purchase Intentions.....	134
8. Standard Deviations and Means for Linkage Type and Sport Commitment.....	135
9. Factorial ANOVA: Linkage Type and Innovation on Product Involvement.....	138
10. Factorial ANOVA: Linkage Type and Innovation on Purchase Intentions.....	138
11. Standard Deviations and Means for Linkage Type and Club Commitment.....	139

LIST OF FIGURES

FIGURE	PAGE
1. Linkage Type and Sport Commitment Interaction on Purchase Intentions.....	132

CHAPTER I

INTRODUCTION

Consumers spend \$25 billion annually on recreational sports like golf, cycling, and tennis (National Sporting Goods Association, 2008). Sporting goods manufacturers sell over \$87 million in equipment and spend countless hours and financial resources creating innovations touted to improve performances for professional and recreational athletes alike (National Sporting Goods Association, 2008). Gaviria (2000) asserted athletes at each level (e.g., professional, collegiate, recreational) possess similar playing characteristics and talents. The ability to gain advantages via sporting goods is what separates winning performances from losing ones (Gaviria, 2000). The goal for manufacturers is to persuade athletes to purchase sporting goods to distinguish themselves from their competitors. The purchases will hopefully improve playing performances for athletes and lead to financial successes for manufacturers (Lampela & Kärkkäinen, 2008; Read, 2000).

Sporting goods innovations are introduced regularly. Sporting goods manufacturers are willing to make significant investments to create innovations and provide the best possible products for consumers. For example, basketball manufacturer Spalding spent \$1 million developing a basketball with an internal pump (Williams, 2003). Callaway spends \$25 million annually on research and development (R&D) expenditures for its golf clubs. Golf innovators as a whole received patents for over 8,000

products within a five-year period (Reisinger, 2002). Like golf manufacturers, cycling companies make significant R&D investments and emphasize the benefits of technology to participants. For example, bicycle manufacturer Cervélo has more engineers than sales personnel. The company spends \$25,000 an hour using wind tunnels to perfect the aerodynamic capabilities of its bikes (Cervélo, 2009). They may also spend countless hours and resources litigating patents and false advertising claims--particularly in the golf industry (Reisinger, 2002). Sporting goods manufacturers have introduced innovations like streamlined, full-body swimsuits (Whitaker, 2008) and football helmets with built-in gauges to help players monitor their body temperatures (Kuang, 2009). ESPN writer Jim Caple noted innovations like face masks, helmets, and sports bras have increased the amounts of protection and comfort afforded players at all levels (Caple, 2007). Without a doubt, innovations play a substantial role within the sport industry. Through these and other innovations, manufacturers continue to transform the way athletes play sports.

Problem Statement

Manufacturers spend time and resources developing and introducing innovations. However, their efforts do not always translate into successes. Six out of every seven product ideas fail to become actual products (Rose-Anderssen, Allen, Tsinopoulos, & McCarthy, 2005). Furthermore, "35-80% of all product development endeavors are failures" (Harrison & Waluszewski, 2008, p. 115). Researchers have identified several reasons for innovation failures. Berman and McLaughlin (1973) asserted innovations fail because they lack support. Consumers targeted to receive the innovation must understand why they should want or need it, and they must be ready and willing to accept it. Without

this support, an innovation will fail, no matter how meritorious (Berman & McLaughlin, 1973; Troshani & Doolin, 2007). Veryzer (1998) also noted innovations fail because they are too new. In his study, consumers were presented with consumer electronic prototypes. The customers could not understand the products and indicated minimal interest in purchasing them. The new products force consumers to make significant modifications to their current lifestyles and routines in order to use them (Veryzer, 1998). Additionally, products may fail because they are perceived as creating an unfair advantage, particularly when a disparity of resources exists between athletes who can afford to purchase the innovations and those who cannot. Individuals with access to the innovations gain significant benefits (e.g., faster times or more wins) versus those who do not (Sheridan, 2007; Trabal, 2008). For example, Speedo introduced a high-end swimming suit, which allowed its users to break Olympic records. International governing body FINA declared the swimsuits unfair and banned the product, beginning in 2010 (Crouse, 2009).

Innovations may also fail because consumers are simply not aware they exist. Individuals must know about and have an interest in the new products. Information about innovations must be provided to potential consumers. This information can include details about product features and benefits, which may increase consumer interest in the innovations and lead to their purchase (Midgley & Downing, 1978; Troshani & Doolin, 2008; Woodside & Biemans, 2005). Sporting goods manufacturers spend millions of dollars each year developing new goods and services for their consumers. They want to ensure the innovations are embraced by their target consumers. Creating products consumers want can help manufacturers achieve this goal. Effective communications must also be in place to help consumers become aware of and learn about the new

products. The current study will focus on the communications process and its relationship to innovations.

Innovation

Addressing the innovation process, Rogers (2003) defined an innovation as "an idea, practice, or object that is perceived as new by an individual or another unit of adoption" (p. 36). An innovation represents something new, perhaps a new idea, good, service, or process (Read, 2000). Innovations may originate from several sources. A manufacturer's internal R&D department may create new products. Manufacturers may collaborate with suppliers or consumers to develop innovations (Desbordes, 2002). Consumers may also develop products to address their specific needs (Franke & Shah, 2003; von Hippel, 1986). Once manufacturers create innovations, they want to distribute information about the products to increase consumer awareness and interest. Communications channels or linkages within the sport industry can help spread the requisite information.

Systems Theory

Linkages represent the ties bringing individuals or organizations together within the sport industry or system, defined as "an organization of organizations" (Berman & McLaughlin, 1973, p. 26). Systems exist wherever individuals and organizations are found. For example, students and their teacher in a classroom form a class, and groups of classes with their students, teachers, and administrators form the school; those schools may then combine with to form an educational school system with its requisite

administrators. In this example and with other systems, organizations and the individuals within the organizations combine to form the system. In forming the system, individuals connect to other individuals, and organizations connect to other organizations (Knoke, 2001). From a sports perspective, the sport system may include players, teams and coaches, governing bodies, and sports media personnel (Stern, 1979). These system members combine to form the system, and they are connected via linkages (Thibault & Harvey, 1997). Other groups included in the sport system are consumers, sponsors, and strategic partners. The sport system could also be divided into subsystems, where sport organizations focusing on tangible sporting goods form one sub-system and sport organizations focusing on intangible sporting services form another sub-system. Within the tangible sporting goods sub-system, supply chain organizations like warehouses and distribution centers may also exist whereas these same organizations may not exist within the service sub-system. Of course, some sport organizations are involved in the provision of both sporting goods and services and help to connect the two sub-systems into an overall sport system (Bawden, 2007). For sporting goods manufacturers in the sport system, one goal may be to introduce innovations and spreading product information about the innovations through the linkages.

Linkages

These linkages exist within a system, and the connections play an important role within the system. In fact, some researchers have asserted system members form systems to gain access to linkages and achieve their individual and collective goals (Bourdieu, 1983; Coleman, 1988). Six types of linkages exist: structural, temporal, ideological,

relational, operational, and technological. Structural linkages address formal policies and reform efforts at the federal and state levels, while temporal linkages refer to the development and persistence of reform efforts over time. Ideological linkages address the attitudes and beliefs individuals have within the system and how these attitudes may influence the system and various organizational goals and objectives (Lasky, 2010). The three linkages arguably most important to sport are relational, operational, and technological linkages. These linkages serve as channels for the exchange of both information and resources. The current study will focus exclusively on linkages as communication channels.

Relational linkages represent relationships among individuals, whether formal or informal (Lasky, 2010). Sport studies have examined the importance of relationships in developing long-term commitment among tennis players (Casper & Andrew, 2008) and socializing new fishing participants (Kuehn, Dawson, & Hoffman, 2006). The linkages can aid the spread of information as participants discuss their sports activities and ways to improve performance with one another. *Operational linkages* are activities created and attended by individuals and organizations in the system (Lasky, 2010). Within sport, these linkages may be formal events created and supported by teams, coaches, and players (Kirk & MacPhail, 2003) and governing bodies (Baldwin, Hiennerth, & von Hippel, 2006) or informal structures like athletes participating in a pickup basketball game or casual group bike ride (O'Connor & Brown, 2007). Information about what sporting goods will aid performance can be transmitted through these activities. Operational linkages give organizations and industries structure and help the spread of information and innovations (Lasky, 2010). Finally, *technological linkages* facilitate the

development of relational and operational linkages. They may be as basic as pen and paper or the telephone (Lasky, 2010), or they may include newer tools like online social networks Facebook and Twitter. These linkages help individuals and organizations interact with one another and share information about activities and innovations.

Technological linkages can also help manufacturers reach target consumers and transmit innovation information on a broader scale beyond individual relationships and events (Fisher, 2008). Linkages play a significant role in helping individuals and organizations achieve goals (Lasky, 2010; Pfeffer & Salancik, 2003).

Sport Commitment and Club Commitment

Sporting goods manufacturers use linkages to aid the dissemination of innovations. Sport commitment and club commitment can also influence the dissemination process. "Commitment reflects factors supporting persistence in a course of action--even in the face of adversity" (Scanlan, Carpenter, Schmidt, Simons, & Keeler, 1993, p. 6). Continued participation with a sport reflects sport commitment (Scanlan et al., 1993), while extended tenure with a sports club demonstrates club commitment (Haggerty & Denomme, 1991). Both commitment types can influence the dissemination of innovations. The more individuals play, the more they invest time and money into the sport and sports clubs (Casper & Andrew, 2008). Committed participants spend time interacting with other athletes and sharing information about the sport, including details about their sporting goods usage. This information sharing can lead to greater awareness about and purchases of innovations (Franke & Shah, 2003).

Product Involvement and Purchase Intentions

Greater innovation awareness coupled with product involvement and purchases leads to the dissemination of innovations. Product involvement reflects an individual's interest in a product and the desire to read about it and discuss it with others (Zaichkowsky, 1985). The receipt of favorable information through involvement activities like participating in a sports practice or competitive athletic event may lead individuals to obtain the product. Purchase intentions represents an individual's intended behavior to purchase the product in the future (Casper, Gray, & Stellino, 2007). Consumers buying the product may then tell others about their purchases, furthering the spread of product information. As more consumers learn about and then purchase new products, the dissemination of innovations occurs.

Research Purpose

The purpose of the current study was to examine the role of communication in the dissemination of innovations. The study focused on linkages in the communication process as the vehicles through which information about innovations is spread.

(1) The study analyzed three linkage types--relational, operational, and technological--and their individual and combined effects on the dissemination of innovations, operationalized as product involvement and purchase intentions.

(2) The study also explored innovation type and whether an innovation as a good or service had an effect on an individual's decision to learn more about or purchase an innovation.

(3) Finally, the study examined the roles of sport commitment and club commitment, assessing the effects of an individual's commitment to a sport or to a sports club on the dissemination process.

Research Questions

The study addressed the following research questions.

1. What is the effect of linkage type on the dissemination of innovations?

1a. There is a significant main effect of linkage type on product involvement.

1b. There is a significant main effect of linkage type on purchase intentions.

The type of innovation--relational, operational, or technological--will have an effect on an individual's product involvement and purchase intentions. Previous studies have found the way individuals learn about products can influence their levels of product involvement and purchase intentions as much as the products themselves (Chaney, 2001; Lyons & Henderson, 2005). Linkages like receiving favorable product information from a trusted friend can have a positive effect on product involvement and purchase intentions (Lyons & Henderson, 2005). Participants may also learn about innovations when a competitor uses the innovation and wins. Witnessing winning performances may generate a greater interest in the products and lead participants to purchase the products (Gaviria, 2000; Hienerth, 2006).

2. What is the effect of innovation type on the dissemination of innovations?

2a. There is a significant main effect of innovation type on product involvement.

2b. There is a significant main effect of innovation type on purchase intentions.

2c. There is a significant interaction effect between linkage type and innovation type on product involvement.

2d. There is a significant interaction effect between linkage type and innovation type on purchase intentions.

The type of innovation, whether a good or a service, will affect an individual's product involvement and purchase intentions. Product involvement studies measuring different products have found varying levels of involvement based on the types of consumer goods analyzed (e.g., instant coffee versus cameras) (Bauer, Sauer, & Becker, 2006; McQuarrie & Munson, 1992; Zaichkowsky, 1985). A connection between product involvement and purchase intentions was hypothesized in the present study. Individuals are more likely to purchase products as they receive favorable information about them and increase their levels of product involvement (Kapferer & Laurent, 1985; Michaelidou & Dibb, 2006; Zaichkowsky, 1985). A hypothesized interaction exists between linkage type (relational, operational, or technological) and innovation type (good or service). How individuals learn about the innovations will influence their product involvement and purchase intentions (Szymanski, 2001). In general, individuals may want to learn more about and purchase sporting goods and services after receiving information (Franke & Shah, 2003; Gaviria, 2000; Hienerth, 2006). However, consumers may prefer to learn about a new sporting good through a face-to-face presentation and a service through a website (Bodkin & Perry, 2004; Szymanski, 2001).

3. What is the effect of sport commitment on the dissemination of innovations?

3a. There is a significant main effect of sport commitment on product involvement.

- 3b. There is a significant main effect of sport commitment on purchase intentions.
- 3c. There is a significant interaction effect between linkage type and sport commitment on product involvement.
- 3d. There is a significant interaction effect between linkage type and sport commitment on purchase intentions.

An individual's sport commitment, whether low, medium, or high, will have an effect on product involvement and purchase intentions. Individuals with higher levels of commitment respond differently than those with lower or more moderate levels. Casper et al. (2007) found tennis players purchased more related products as their commitment levels increased. McGehee, Yoon, and Cardenas (2003) reported runners with higher levels of involvement spent more time learning about products and subsequently purchased more related goods and services. Increases in sport commitment are correlated with increases in product involvement and purchase intentions. A hypothesized interaction exists between linkage type (relational, operational, or technological) and sport commitment (low, medium, or high). Individuals with higher sport commitment spend more time engaging in sports activities with other participants. The relationships may enhance a committed member's responsiveness to innovation information provided by other participants, delivered during sporting events, or received via sports-related websites (Lüthje, 2003; Lüthje, Hertstatt, & von Hippel, 2005; Tietz, Morrison, Lüthje, & Herstatt, 2004).

4. What is the effect of club commitment on the dissemination of innovations?

- 4a. There is a significant main effect of club commitment on product involvement.

- 4b. There is a significant main effect of club commitment on purchase intentions.
- 4c. There is a significant interaction effect between linkage type and club commitment on product involvement.
- 4d. There is a significant interaction effect between linkage type and club commitment on purchase intentions.

An individual's club commitment, whether low, medium, or high, will have an effect on product involvement and purchase intentions. Individuals with higher levels of club commitment express greater interest in learning about new sporting goods and services. As they interact with other club members, participants receive and share information about new sports products (Franke & Shah, 2003; Lüthje, 2003). A positive relationship exists between club commitment and product involvement and purchase intentions. A hypothesized interaction exists between linkage type (relational, operational, or technological) and club commitment (low, medium, or high). Individuals with higher club commitment spend more time around club members and engage in sports activities with other participants. The relationships may enhance a committed member's responsiveness to innovation information provided by other club members, delivered during club or sporting events, or received via sports-related websites (Franke & Shah, 2003; Lüthje, 2003).

Study Significance

Sporting goods manufacturers invest R&D resources attempting to create innovations consumers want to buy. Manufacturers want to ensure their innovations reach target consumers. Likewise, consumers want innovations in efforts to improve their

athletic performances and playing enjoyment; they also want information about product innovations. To initiate the dissemination process, consumers first need to know the innovations exist and have the desire and ability to gather information about them. Understanding how individuals learn about and make decisions to purchase innovations can help manufacturers with the dissemination process.

The current study incorporated a systems theory approach. Systems theory addresses the relationships and exchanges among individuals and organizations within a system, including the spread of information and innovations (Senge, 2006). In conjunction with systems theory, the study used a linkages conceptual framework which developed from systems theory. The framework helps to define and describe the relationships and related information and resource exchanges between system members in more detail (Lasky, 2010). Using systems theory and the linkages conceptual framework in the current study marked a move away from traditional innovations research. The study added to the literature by presenting a different lens through which to explore and understand the innovation process, specifically the exchange of information between system members. By providing insights into the system--its members, the linkages connecting them, the information exchanged--the study may help manufacturers understand the dissemination process more fully, particularly how to leverage linkages to spread innovation information and innovations.

The study examined three linkage types in the same study. Linkage studies have often explored linkage types separately, studying the effects of a single communications channel like word-of-mouth (Lyons & Henderson, 2005) or web portals (Van Baalen, Bloemhof-Ruwaard, & Van Heck, 2005). The current study combined the linkage types

to assess their comparative effectiveness in the dissemination of innovations. Previous studies have reported the effects of a single linkage type in generating product sales or other benefits (Ko, Yin, & Kuo, 2008) but did not often assess the relative importance or strength of one linkage type versus others. By combining three linkage types, the current study helped to determine if one type corresponded with higher levels of product involvement and purchase intentions. The study provided a mechanism through which future research can be conducted to examine and assess multiple linkages simultaneously. The results may prove useful for manufacturers seeking to reach target consumers effectively. Determining which linkage types correspond with the highest levels of product involvement and purchase intentions will help manufacturers identify where to focus their dissemination efforts. The findings may prove relevant not only for the sporting goods industry but for other manufacturing industries, particularly for manufacturers of consumer products. Previous studies have examined products like wine (Chaney, 2001), music (Lyons & Henderson, 2005), and movies (Tsang & Zhou, 2005), and the effects of one or two linkage types on the dissemination of innovations. Combining two or more linkages together in the same study, researchers could determine which linkages are most effective in transmitting product information to consumers.

Finally, the study incorporated two variables unique to sport, sport commitment and club commitment. The variables measure an individual's ongoing desire to participate in a sport or club and were hypothesized to have a positive effect on the dissemination of innovations--the higher the levels of sport commitment and club commitment, the more individuals would become involved with and purchase innovations. Previous studies have examined sport commitment in conjunction with product involvement (McGehee et al.,

2003) and purchase intentions (Casper & Andrew, 2008; Casper et al., 2007). The present study took the approach of including both variables in the same study to assess their single and combined effects on the dissemination process. The results added to the literature regarding the relationship between commitment and the two variables and will aid in understanding whether the presence of each commitment type helps the dissemination process. This information may prove useful for manufacturers looking to generate product involvement and purchase intentions. Commitment levels may influence an individual's response to an innovation. Manufacturers will want to understand this relationship and potentially tailor marketing messages to address an individual level's of commitment to a sport or a club as a way to spread new product information effectively.

Cycling and the Sporting Goods Industry

The current study explored the dissemination of innovations within the sporting goods industry and focused on a single sport, cycling. This sport was chosen for further exploration for several reasons. Cycling is a popular pursuit in recreational sports. Over 47 million people ride their bikes at least once per year, and participants spend close to \$390 million on bikes and accessories annually. Only recreational golf and sailing participants spend more money on their sports (National Sporting Goods Association, 2008). Like golf and sailing, cycling is a sport driven by technology. Cycling manufacturers incorporate state-of-the art materials such as carbon fiber and titanium into their products and use wind tunnels to test their aerodynamic capabilities. They also participate in annual trade shows like Eurobike and Interbike to display the latest innovations for the upcoming cycling season (*VeloNews*, 2009). While not as popular as

professional football or baseball in the US, professional cycling still has a sizeable fan base. Spectators have expressed renewed interest in the sport with Lance Armstrong's return from retirement in 2009. Races like the Tour of California and Tour of Missouri have grown in recent years, and they attract cyclists and media coverage from around the world (*Bicycling*, 2009).

Numerous cycling outlets exist for spectators and professional athletes. Cycling opportunities are also available for recreational riders. In comparison to other recreational sports like golf or tennis, cyclists do not need extensive equipment and dedicated playing spaces to gain entry to the sport. They only need a bike and an accessible road, park, or bike path to participate. They can ride with others in club group rides or alone via solo training rides or commutes around town. More serious cyclists can also participate in local, regional, and national bike races and triathlons. The sport has a wide variety of participants representing a broad range of ages, educational backgrounds, and income levels (*LocalCycling*, 2006). Because of its technological focus and recreational popularity, cycling was chosen for exploration in the current study.

Delimitations

Several delimitations existed with the study. First, the study examined the cycling sporting goods industry. Cycling is an important part of recreational sports and the sporting goods industry as evidenced above. The sport has a constant stream of innovations, and its participants spend millions each year on related products. To reach consumers, cycling manufacturers use linkages like cycling magazines and trade shows to spread information about the products. The sport espouses a pro-innovation stance and

uses multiple linkages in the dissemination of innovations. Thus, cycling can provide insights into the dissemination process within the larger sporting goods industry.

Second, the study measured the effects of innovation type and linkage type on product involvement and purchase intentions, yet other variables may influence the dependent variables or explain the dissemination process. Economic, social, and political variables such as changing discretionary income or political unrest can have a significant influence (Tanner & Fiore, 2004). However, innovation type and linkage type were deemed most essential as the study focused on linkages, specifically how information is transmitted about new products in the dissemination process. Cyclists spend time learning about innovations, which can increase their cycling performance and enjoyment. They also participate in clubs and events and use various linkages to enhance their levels of commitment to the sport (O'Connor & Brown, 2007). Therefore, innovations and linkages were the focus of the study as they play important roles with cyclists looking to purchase new products.

Finally, the scenarios were developed using information received from interviewees. Two innovation types, a good and a service, were used in the survey based on input from members of a cycling club. The innovations and linkages they described may not reflect ones identified by members of different cycling clubs or organizations or by cyclists who do not belong to a cycling club. A variety of cycling products are introduced to consumers each year and could have all been chosen for examination. Yet including a larger product selection may have overwhelmed survey participants. Products most often mentioned by the media or randomly chosen ones could have been used but may have had limited application to the sample population. Instead, a small subset of

sample members were asked to list new products important to them. Those cited most often were included in the survey to provide the widest application for the most survey respondents.

Limitations

Several limitations existed with the study. First, the study focused on a single sport and sports club within the cycling industry. The cyclists in this study may have provided different responses as compared to participants in other sports, especially those playing more clearly defined team versus individual sports. Additionally, survey respondents were members of a sports club located in a Midwestern US city. Club members residing in other US regions or countries may have responded differently.

Second, the scenarios asked respondents to make statements about their product involvement and purchase intentions. The scenarios may not have fully reflected reality as they focused on select variables like innovation type and linkage type. To minimize the effect of this limitation, the study chose innovations and linkages most important to cyclists. However, even completing a scenario tailored to them, the respondents may have reported purchase intentions which did not reflect their actual behaviors. Previous research has shown purchase intentions can serve as a reasonable proxy for future sales (Casper et al., 2007; McGehee et al., 2003). Yet an extended period of time between projected purchase intentions and actual purchases could lead to a disconnect between the variables. After a manufacturer introduces a new product, competitors often rush to develop similar products, which may prove superior to the original product. Respondents may ultimately choose to purchase the latter product versus the one addressed in the

study. For example, a sporting goods study could explore the purchase intentions for a helmet created by Company X. Cyclists completing the survey indicate they would purchase Company X's helmet. Company Y later introduces a better helmet. Although survey participants said they intended to purchase Company X's helmet, they ultimately purchase Company Y's product. Their final decision creates a disconnect between their purchase intentions and their actual purchases. Additionally, consumers may face changing economic conditions like a job loss or a new addition to the family, which could affect their discretionary income and future purchases.

Third, survey participants were limited to members attending club rides and those accessing an online survey. An attempt was made to solicit responses from a wide variety of riders. Paper surveys were distributed during rides over a four-week period to collect data from various demographic groups (e.g., gender, participation tenure, participation frequency). The surveys were collected over this extended period of time to access riders who may participate less frequently. Surveys were also distributed online. Electronic mail regarding the survey was sent to members via the club listserv. Members were informed about the study's purpose and where they could complete the survey, either at upcoming club rides or online via a website link included in the e-mail message. Club members who were not present at the selected rides, do not participate in any group rides, or do not have access to or use the club listserv or Internet may have had different responses. Caution should be used when generalizing the findings to the cycling club or other organizations within the sporting goods industry.

Organization of the Dissertation

The dissertation defines and discusses innovations and how a linkages conceptual framework could be used to study the dissemination of innovations in cycling with two cycling-specific products. A mixed-methods approach for studying the dissemination process was proposed via the linkages conceptual framework. Finally, linkage type with innovation type, sport commitment, and club commitment were analyzed for their effects on the dissemination process operationalized via product involvement and purchase intentions.

Definitions

Innovation: deliberate use of resources to develop new goods and services, including revisions to current products and radically new designs (Huberman, 1973)

Linkage: ties bringing individuals or organizations together (Lasky, 2010)

Relational linkage: personal connections among industry members, whether formal, informal, or ideological (Lasky, 2010)

Operational linkage: industry activities such as meetings, competitions, and presentations, which combine to form organizational and industry structures (Lasky, 2010)

Technological linkage: technical or electronic mechanisms like pen and paper or online social networks used to support relational and operational linkages (Lasky, 2010)

Sport commitment: expressed willingness to continue playing a sport (Scanlan et al., 1993)

Club commitment: expressed willingness to continue participating in a sports club (Haggerty & Denomme, 1991)

Product involvement: mental, emotional, or physical response to a product, can include heightened interest and enthusiasm or a desire to read about or discuss the product (Zaichkowsky, 1985)

Purchase intentions: projected future purchasing behavior regarding a good or service (Kwon et al., 2007)

Sporting goods and services: equipment and other products used to participate in a sport (Franke & Shah, 2003)

Sports club: organization which hosts sports-related activities for its club members (Haggerty & Denomme, 1991)

Club members: individuals who belong to and participate in a sports club (Haggerty & Denomme, 1991)

Cycling industry: organizations, individuals, and activities related to the development, production, dissemination, and usage of bicycles, accessories, and services (Albert, 1999)

Cycling sports club: sports club which caters specifically to cyclists and offers cycling-related activities such as touring, education, and advocacy for club members (Albert, 1999)

CHAPTER II

LITERATURE REVIEW

The study explored the dissemination of innovations within the sporting goods industry using Lasky's (2004) linkages conceptual framework to explain how participants learn about and respond to innovations. This chapter outlines the study's key variables-- innovation type, linkage type, sport commitment, club commitment, product involvement, and purchase intentions-- and reviews the related literature in more detail.

Innovation

Rogers (2003) focused on the idea of new in his innovation definition, whether a new product, process or policy. Other researchers have offered different innovation definitions. Huberman (1973) defined an innovation as the deliberate use of resources to develop significantly new goods or services. Gaviria (2000) recognized the idea of radical innovations but also highlighted the importance of more moderate innovations. In his study of the cycling industry, Gaviria noted "innovations are often introduced in a crude form leaving a lot of room for improvement and alteration" (p. 55). Smaller revisions to initial innovations may prove just as important as the original innovation (Gaviria, 2000). The current study characterized innovation by combining the definitions: a deliberate use of resources to develop new goods and services--both revisions to current

products and radically new designs--to help participants improve their sport performance and enjoyment.

The sailing and handcycling industries provide examples of sports-related innovations. Handcycles and other wheeled mobility devices have evolved substantially over time. Researchers have reported numerous disadvantages to using traditional wheelchairs, which are propelled by moving the wheel rims. Studies have shown such movement can strain an individual's muscular, skeletal, cardiovascular, and pulmonary systems. To counter this stress, innovators have created alternatives like electronic wheelchairs. Handcycles have also become a viable option and have grown in popularity within the last two decades (van der Woude, Bosmans, Vervoets, & Veeger, 2000). According to the US Handcycling Federation (USHF), handcycles were originally created and used by able-bodied individuals in a competitive sports environment (USHF, 2006). Persons with disabilities recognized and embraced the design's benefits. Lower energy levels were required to propel the handcycles and gain increases in power output. More individuals have adapted them for personal and competitive use (Faupin, Gorce, Meyer, & Thevenon, 2008; van der Woude et al., 2000; van der Woude, de Groot, & Janseen, 2006; Zipfelentity, Olson, Puhlman, & Cooper, 2009).

Handcycling innovators have worked to introduce new features for improved performance. In their study of handcyclists, Franke and Shah (2003) found 26% of survey participants had developed some type of modification, including a better braking system (Franke & Shah, 2003). Competitive handcyclists have also watched road cyclists and incorporated their materials, equipment, and services like hydration systems, training

techniques, and nutritional intake guidelines to improve their performances (USHF, 2006).

Handcycles are expected to become the option of choice for many users as they age (van der Woude et al., 2006) and the sport grows in popularity (USHF, 2006). The handcycle reflects the idea of universal design, where innovators create products to meet the needs of a wide range of individuals. Universal designers recognize people are not the same. Everyone has a different set of abilities and needs, which can transform over a lifetime. As a result, universal designers try to develop products to meet changing needs and abilities with a single product--one consumers can use their entire lives (Institute for Human Centered Design, 2008). Along with handcycling, other sports like sailing have started to recognize the importance of universal design. For instance, Access Dinghies provides sailboats to be used by individuals with disabilities and novice sailors alike. The boats offer greater stability and fewer, less complicated controls. The features allow sailors to increase their handling skills and confidence more quickly. The organization encourages the sailing industry at large to embrace the boats and to develop other products using universal design. Unlike handcycling, sailing as a sport has decreased in popularity over the years. Opening the sport to more participants with products appealing to a wider variety of users may help reverse the trend (Access Dinghies, 2009). The intersection between sport participants and everyday users in sailing and handcycling will likely lead to more product innovations. Manufacturers these and other sport industries can provide innovations which enhance everyday living and improve competitive performance.

Mountain biking represent another industry where significant innovations have been introduced over time. In the late 1960s, California road cyclists wanted to ride down mountains, but the available bikes could not withstand such usage safely. Innovators worked together and fashioned a hybrid bike using parts from old steel bikes with wider tires and sturdier frames, building what would eventually become mountain bikes. The innovation had a great impact on the cycling industry, and mountain bikes now represent 75% of all bikes sold (Lüthje et al., 2005). The bikes continue to undergo modifications. Participants have developed increasingly specialized bikes to meet the needs of mountain biking subgroups like downhill and cross-country cyclists (*VeloNews*, 2009). Similar innovation growth has been documented in other sports such as cross-country skiing (Lüthje, 2003), sailplaning (Franke & Shah, 2003), and windsurfing (Tietz et al., 2004).

Much of the innovation research is biased towards successful innovations (Soule, 1999). However, not all innovations are positive nor are they all embraced (Sheridan, 2007; Soule, 1999; Trabal, 2008). The dissemination process creates unknowns for manufacturers who must try to project which customers will be interested in their products and how much they may be willing to buy. The uncertainties create a "survival of the fittest" (Knoke, 2001, p. 41) climate among organizations. Those who can project the dissemination of innovations successfully will survive and perhaps thrive in the environment. They may do so by finding opportunities to generate unique products and services and create competitive barriers to entry (Astley & Van de Ven, 1983). Those who do not may falter and eventually die away, leaving space for new organizations to form in their place (Knoke, 2001; Majone & Wildavsky, 1978).

Innovations can also create unknowns for consumers. Studies have examined the differences between innovation types, whether goods or services, and have reported services are often characterized by the uncertainty they generate for consumers versus goods. A good can be defined as "a physical entity composed of tangible attributes which buyers purchase to satisfy specific wants and needs" (Murray & Schlacter, 1990, p. 53). In defining a service, researchers have acknowledged the lack of definitional consensus and often resort to classifying a service based on several attributes, including intangibility and heterogeneity (Vargo, 2004). Intangibility represents a consumer's inability to physically touch a service. The quality can also address a consumer's challenge to picture the service mentally or to describe its potential features and benefits (Laroche, Bergeron, Goutaland, 2003). Heterogeneity discusses the variable nature of services, which can vary based on how long the service will be used, how much it will cost based on its usage, who is delivering the service, the social compatibility between the provider and the consumer, and the level of customization desired by the consumer (Jackson, Niedell, & Lunsford, 1995; Vargo, 2004). In comparing services to goods, researchers have found service intangibility and heterogeneity can create consumer uncertainty. This uncertainty can lead to heightened perceptions of risk associated with purchasing the service (Murray & Schlacter, 1990) and subsequently a limited interest in purchasing the service (Laroche et al., 2003).

Service providers can mitigate these feelings by increasing a consumer's knowledge of the product and its potential benefits (Laroche et al., 2003). Studies have shown the importance of matching the communication channel or linkage with the service to provide appropriate information. For example, Szymanski (2001) found

consumers responded more favorably to goods when they heard about them during a face-to-face presentation and services when they heard about them over the phone. Uncertainty can also be reduced when the consumer experiences a positive and trusting interaction with the seller (Söderlund & Julander, 2003; Vorhies, Rao, & Kurtz, 1998). Service providers can also reduce uncertainty by offering tangible goods in conjunction with their services or discounted or free services to potential consumers. Employing one or more of these approaches can help service providers lower consumer uncertainty and potentially increase product sales (Laroche et al., 2003; Murray & Schlacter, 2000).

While consumers express uncertainty regarding services, they may also display similar feelings for innovations, whether goods or services (Veryzer, 1998). Increased product knowledge becomes important for consumers trying to manage these feelings. Sport goods manufacturers must utilize communications to spread product knowledge, a key requirement for successful dissemination of innovations. The above studies provide examples of effective communication at work, particularly in creating new sporting goods and spreading information about them. Handcyclists compete against one another but also learn about innovations while at competitive events. Operating as a community of participants, they know each other and can share information about new goods and services. They also work towards developing equipment innovations not found in commercially available equipment (Franke & Shah, 2003). Similarly, mountain bikers engage in informal information exchanges to develop better products to handle off-terrain settings. Modifications and specialization over time have led to more bikes for smaller specialty groups throughout the industry (Lüthje et al., 2005). Whether through

competitive events or personal interactions, information about the products is shared through different communications channels or linkages.

Diffusion of Innovations

The communications channels have been addressed in innovation research, which has focused primarily on the diffusion of innovations theory (Knoke, 2001; Rogers, 2003). Rogers (2003) defined diffusion as "the process in which an innovation is communicated through certain channels over time among the members of a social system" (p. 5). Diffusion begins with an innovation, which represents something new: a new idea, product, service, or process (Rogers, 2003). The diffusion model centers on the communications and interactions between individuals as they respond to an innovation. When considering new products and services, individuals will seek information and advice from a variety of sources like personal contacts and the media. They will decide whether to adopt or reject innovations after gathering the requisite information. Obtaining favorable product knowledge through various communication channels becomes key to the initial adoption process. Product adoption can then lead to diffusion as more consumers learn about and embrace the product and consequently spread favorable information about it. The collection and dissemination of information precedes and then aids the diffusion process. Conversely, unfavorable information can lead to an innovation's diffusion stalling as potential consumers refuse to adopt the new product (Rogers, 2003).

An example from the rodeo kayaking industry helps to illustrate the diffusion process. Rodeo kayakers perform tricks in whitewater conditions. As the sport

progressed, kayakers paddled in increasingly challenging settings but found their boats lacked the requisite maneuverability. A smaller subset of kayakers developed new kayaks to address the shortcomings, making the boats shorter and more streamlined. More progressive and innovative kayakers saw and purchased the innovations first. They reported improved performances, including more wins at competitive events. Other kayakers expressed interest in the redesigned kayaks after witnessing the successes of the innovators and early innovation adopters. Sporting goods manufacturers began to mass produce the boats to meet the increasing demands of more mainstream kayakers. Eventually, the innovations saturated the kayaking marketplace. Ancillary products such as paddles and helmets were also developed to accommodate the new techniques and performance levels achieved with upgraded kayaks (Hienerth, 2006).

Numerous researchers have embraced diffusion theory to explain the movement of innovations. The theory has been applied in a variety of settings such as academic research (Crane, 1969; Moody, 2004), fashion (Crane, 1998; Kim, Rhee, & Yee, 2008), patents (Chang, Lai, & Chang, 2008; He & Fallah, 2008), and movies (Duan, Gu, & Whinston, 2008; Ko et al., 2008). Yet despite its popularity, critics have noted a major limitation with the theory. Some researchers have criticized the diffusion model as too simplistic with its linear progression from innovation development to initial adoption to widespread diffusion (Knoke, 2001; Tanner & Fiore, 2004). They have suggested innovations rarely move quickly and efficiently. Instead, an innovation faces an iterative process of additional inputs and revisions before the final product is embraced by the majority of users (Burns, 2007; Forrest, 2007).

The current study also moves away from the diffusion theory. Compared to other industries, the sport environment contains elements which make it unique, including numerous individuals and organizations (e.g., teams, sponsors, governing bodies) within the environment, the simultaneous competition and cooperation among the different groups, and greater consumer interest in and commitment to sports products. Innovations can derive from any or all of the groups within the sport environment (Mullin et al., 2007). An athlete may work with a manufacturer to develop specific equipment to meet her needs. In turn, manufacturers may work with retailers to sell the products to other consumers. While innovations are typically viewed as beneficial, sport organizations like governing bodies may step in and limit the use of such innovations, particularly when the products are perceived as altering the competitive balance among participants (Sheridan, 2007; Trabal, 2008). As a result, innovations rarely move among sport organizations and individuals in a linear fashion as purported by the diffusion of innovations theory. Instead a manufacturer may introduce a product, the governing body or athlete may mandate revisions before potential users will accept the product. Consumers also have higher interest in and commitment to the sport products and may influence the innovation development process more than they might with other consumer products like automobiles or small appliances (Mullin, Hardy, & Sutton, 2007). As a result of these unique sport characteristics, a different theory and conceptual framework was required to study the sport environment more fully.

Systems Theory

To counter the diffusion theory's limitations of being too simplistic and linear, researchers have proposed systems theory. Multiple definitions have been used to describe a system, including simply "an organization of organizations" (Berman & McLaughlin, 1973, p. 26) or more fully as "a set of interrelated, conceptually inseparable, functionally unique parts that interact with each other to operate as a whole" (Tanner & Fiore, 2004). Individuals combine to form organizations, which in turn operate together and form the larger system. Sub-systems (systems within systems) and supra-systems (systems of systems) can also exist. Systems possess an inherent complexity. Individuals and organizations within systems can introduce changes like new products, policies, or procedures. Because of the many members existing within the system, the introduction of changes may have varied and unpredictable outcomes for other system members and the system itself (Bawden, 2007; Reynolds, 2007; Tanner & Fiore, 2004). Researchers have examined systems and the effects of changes within them in a variety of fields, including agriculture (Bawden, 2007; Meter, 2007), transportation (Tay, Bobby, & Lim, 2007), education (Berman & McLaughlin, 1973; Datnow & Stringfield, 2000; Lasky, 2010), business (Knoke, 2001; Pfeffer & Salancik, 2003; Senge, 2006), and politics (Knoke, 2001). They have also applied systems theory to sport (Chelladurai, 2005; Thibault & Harvey, 1997).

Multiple organizations exist within the sport system such as teams and leagues (Chelladurai, 2005), governing bodies (Stern, 1979), media (Chelladurai, 2005; Stern, 1979), corporate sponsors (Thibault & Harvey, 1997), and government agencies (Thibault & Harvey, 1997), to name a few. Thibault and Harvey (1997) described the

system as "the involvement of a number of organizations, operating at different levels, participating in a 'coordinated' fashion in the achievement of their goals and objectives" (p. 45). To meet their goals, sports organizations within the system come together and engage in various activities. These activities may include hosting and broadcasting sporting events, sponsoring teams and activities, promoting healthy living through sport, and developing new sporting goods and services (Thibault & Harvey, 1997).

Thibault and Harvey (1997) used system theory to examine the Canadian amateur sport environment. Their hypothesized system incorporates three primary groups: the state, the nonprofit sector, and the private sector. The state represents the government at the federal, provincial, and municipal levels. Nonprofit organizations include sport providers at the same as well as international levels. The private sector comprises sporting goods manufacturers, corporate sponsors, and the media. Together, the three groups work to achieve their various goals. Corporate sponsors may provide sport organizations with funding to host events in return for greater visibility with target customers. Government organizations may also offer funding to sport providers, which directly helps citizens gain health benefits through sport participation and indirectly helps to lower government-funded healthcare as residents pursue healthier lifestyles. System members may create formal relationships to capitalize on shared benefits. Doing so introduces stability into the system and ensures system members receive valuable resources and benefits while working to deliver amateur sports (Thibault & Harvey, 1997).

System members rely upon one another, sharing resources and working to achieve their goals. Interdependency often exists within the system. The action of an individual or

organization in one part of the system can have direct or indirect effects on other system members. Researchers attempt to understand the actions initiated by system members and their effects on the system. More specifically, researchers want to know from where in the system the actions originate and how do system members respond? Actions can include the introduction of new policies or procedures. They can also include the introduction of innovations.

With systems theory, an innovation goes through a process whereby various groups modify the innovation to meet their demands and make sense of the innovation in their respective contexts. The innovation also influences individuals who come into contact with it, potentially changing the way they operate and interact with others. The previous rodeo kayaking example can be examined from a systems theory perspective to understand how the theory departs from the diffusion of innovations theory.

From a systems theory perspective, the kayaking innovations underwent multiple revisions before the products were readily accepted by the majority of participants. The most adventurous kayakers adopted the innovations, while others continued using their previous boats. Participants rejecting the new designs may have perceived the kayaks as too new or an unnecessary departure from the commercially available kayaks. Some purchasers of the new kayaks made additional product changes, retrofitting the boats to meet their individual needs or making them more palatable for a wider range of kayakers. Over time, competitive performances increased substantially for participants using the new designs. Kayakers who rejected the innovations previously began to embrace the new designs. Participants continued to make design changes and also introduced related products to enhance this usage (Hienerth, 2006).

Using systems theory, the rodeo kayaking example shows how change activities like the introduction of an innovation can affect and is affected by the system and its members. Rather than a linear progression from introduction to adoption to diffusion, the kayaks underwent multiple changes before the majority of kayakers used the revised designs. Systems theory moves beyond the diffusion theory's linear approach. The theory addresses the complexity evident in the system based on the actions and interactions of individuals and organizations. Changes like an innovation introduction occurring can have implications for system members and the system as a whole. Systems theory proponents assert researchers need to acknowledge the system's complexity and the implications of introducing change like innovations within it (Knoke, 2001).

Resource Dependency

System complexity can create resource dependencies, whereby individuals and organizations within the system must rely upon other system members to attain resources and achieve their goals. Some theorists believe this dependency is what drives system members to work together initially (Bourdieu, 1983; Coleman, 1988). An unlimited number of opportunities exist for system members. In the sport system, the opportunities include introducing new sporting goods and services or offering new games and events for sports participants and spectators. However, for system members, a limited number of resources exist to pursue the opportunities. Working together, individuals and organizations may leverage their combined efforts and resources to reduce dependency constraints and increase shared power (Knoke, 2001; Pfeffer & Salancik, 2003). Members who can best manage interdependencies and gain access to information and

other resources may obtain a position of control within the system (Pfeffer & Salancik, 2003; Thibault & Harvey, 1997).

This control or leverage may become especially important for smaller manufacturers who do not possess the same financial and material resources as larger organizations. For instance, large international companies like Nike and adidas offer a wide variety of sports products, including apparel, footwear, and equipment, for multiple sports. Nike generated \$19 billion in sales in 2008, covering sports as wide-ranging as baseball, lacrosse, and yoga, and selling everything from shoes to backpacks to swimsuits (Nike, 2008). At the other end of the spectrum, smaller specialty companies such as Burton and Specialized feature more narrow product lines for a few select sports. Compared with Nike, Burton made \$39 million annually selling snowboards (Yahoo! Finance, 2008a), and Specialized generated \$20 million in annual cycling sales (Yahoo! Finance, 2008b).

An uneven distribution of revenues and resources often exists among industry members. Partnering or collaborating with other organizations can help smaller companies and organizations manage the flow of economic resources and information (Rigby, Day, Forrester, & Burnett, 2000). Industry members need to understand how to best manage their resource dependencies (Sternan, 2001; Woodside & Biemans, 2005).

Linkages Conceptual Framework

Linkages can help system members gain access to requisite resources and mitigate resource dependencies. "A linkage is in essence a bridge: It creates the connection between two otherwise disconnected points. It is an expression of existing capacity

[individual, collective, and material], while also being an aspect of capacity building" (Lasky, 2010, p. 4). Linkages are the relationships among organizational members. They can also be described as the "interaction of economic, social, cultural, and physical resources within a territorial unit...[or] collaboration between key actors having access to or being responsible for these resources" (Hummelbrunner, 2007, p. 161).

The definitions emphasize the dual role of linkages. They are the structures which aid the industry's formation and resource exchange processes, and they are the levers used to create partnerships among industry members (Hall & McGinty, 2005). Linkages can bring members together, helping them to achieve their organizational goals, exchange resources, create economies of scale, and interject consistency and stability into their interactions with other system members (Chelladurai, 2005). They are important for relationships among industry members as they access and exchange resources (Lasky, 2010).

Lasky (2004) identified multiple linkages, including structural, formal and informal, and temporal linkages. The three linkages arguably most applicable to sport are relational, operational, and technological.

Relational Linkages

Relational linkages reflect the personal connections among industry members and can be characterized as formal, informal, or ideological (Lasky, 2010). Granovetter (1973) called linkages among members "ties" and evaluated them on the basis of their relative strength. Factors impacting relationship strength include time spent with other industry members, levels of emotional and intimate bonding, and frequencies of resource

exchanges. Strong ties among members often grow from shared similarities; they also restrict the flow of new information and resources. Members of a tight and cohesive group may rely more frequently on one another for information. Their information sources overlap and limit access to outside information. Conversely, weak ties help to spread information and resources. Weak ties represent relationships where industry members have limited interactions. Yet these relationships may prove valuable as members receive information and other resources from non-overlapping sources. Evidence of what Granovetter called the "strength of weak ties" has been found in job searches where individuals with larger networks can find jobs more often through friends of friends ("weak ties") versus contacts in their immediate social circles ("strong ties"). While more infrequent, weak ties may connect members to the larger industry and give them additional power as their personal contacts and resource bases grow (Granovetter, 1973).

Resources can include information (Chelladurai, 2005; Reynolds, 2007) as well as economic capital and social capital (Bourdieu, 1983). Economic capital represents money and other tangible resources like manufacturing plants, property, and equipment and the human labor associated with capital usage (Bourdieu, 1983; Coleman, 1988). Social capital derives from a member's ongoing personal relationships with other system members. Bourdieu (1983) defined social capital as "the aggregate of the actual or potential resources which are linked to...membership in a group--which provides each of its members with the backing of the collectively-owned capital, a 'credential' which entitles them to credit" (p. 248-249). This capital reflects the relationships members form over time and their ability to leverage those relationships through access to favors or

resources as needed (Bourdieu, 1983). Social capital aids and fosters relational linkages. The larger the group, the more connections members can make and the more social capital they can potentially generate. Individuals form clubs and organizations with the purpose of creating social capital. Group membership provides incentives for system members to begin and continue their participation. Longer tenures may lead to stronger ties, more relationships, and even greater levels of social capital (Bourdieu, 1983; Coleman, 1988; Fulkerson & Thompson, 2008; Williams, 2006). As they utilize their social capital, members create and maintain power within a group, organization, or industry (Coleman, 1988; Bourdieu, 1983); improve financial performance; and create competitive advantages (Chelladurai, 2005). Learning how linkages create structure within the system may help researchers and system members determine how resources move through the industry and how to leverage the resource exchanges more effectively (Hummelbrunner, 2007; Stern, 1979; Thibault & Harvey, 1997).

Sport studies have explored the relational linkages among participants in different sports. Franke and Shah (2003) examined participants from the sports of handcycling, sailplaning, canyoning, and boardercross who created new sporting goods to address their unique needs and enhance their playing performances. As innovators, they interacted frequently with other industry members. On average, these innovators identified three to five key members from whom they solicited advice. Their contacts responded with helpful information; they also directed the innovators to information sources outside their core circles. Contacts did not expect monetary compensation but rather access to future information exchanges facilitated by the relational linkages. The innovators enjoyed connecting with innovators in both sport and non-sport activities like getting together to

watch movies or have dinner parties. Strong ties with friends and weak ties with friends of friends led to greater innovation productivity and product marketability as innovators connected with users in and outside of the industry, especially individuals who could later purchase the innovations and tell others about them (Franke & Shah, 2003).

Baldwin et al. (2006) found a similar scenario with rodeo kayakers. The kayakers often collaborated as they created new boats and complementary products. They created more successful innovations when they combined their resources and worked together rather than in isolation (Baldwin et al., 2006). Schreier, Oberhauser, and Prügl (2007) also analyzed participants as innovators in the kite surfing and technical diving industries. The innovators represented the cutting edge of the industry, and other participants valued their product insights. An innovator's endorsement of a new product often convinced other participants to purchase the product. This influential effect could lead to earlier and more complete adoption and dissemination of innovations as the innovators provide a credible source of product information (Schreier et al., 2007).

Information about innovations is created by information providers and can be transmitted through relational linkages. Information providers assume an authoritative role. They believe the opinions they express regarding various goods and services should be followed or at least acknowledged for its value to information recipients (Valente, 1996). Information providers go beyond their closest social circles to gather information, often turning to social contacts in other cities. Branching out exposes them to more information and trends not experienced in their local settings (Valente, 1996). This finding proves similar to Granovetter's (1973) discussion of weak ties used to gather information from a broader range of social contacts. Information providers also buy more

products, which enhances their ability to give relevant product information to others. For example, Chaney (2001) found a significant relationship between providing information and making frequent purchases in his study of wine consumers. Before making their own purchases, information providers utilized a variety of information sources, including print and television media and wine tours. Their extensive information gathering and purchasing processes allowed them to draw informed conclusions and later offer this information to other users (Chaney, 2001). The additional information sources and information gathered lends credibility to information providers. Information seekers are more likely to turn to these sources for information (Valente, 1996).

Information providers along with innovators in the sport industry often possess extensive sports experience and product knowledge. Innovators use these intangible resources to address current market shortcomings and produce innovations to meet sports participant needs. Innovators assist in developing new products and later in adopting and disseminating the products to participants in and outside of their sports communities (Franke & Shah, 2003). Word-of-mouth communications from innovators and information providers may play a key role in the spread of innovations, particularly for manufacturers with limited marketing resources. The credibility and influence of these communications via relational linkages may exceed less personal ones (Woodside & Biemans, 2005). Relational linkages represent the first linkage type within the sport industry and provide the structure from which operational and technological linkages can form.

Operational Linkages

Operational linkages are industry activities such as meetings, functions, games, and presentations, which combine to form organizational and industry structures and facilitate the spread of information and innovations (Lasky, 2010). Industry members participate in a variety of sports-related outlets, which can both result from and strengthen relational linkages. Numerous operational linkages exist within the sport environment. Teams, leagues, and clubs add structure for coaches, players, and spectators through practices and games (Kirk & MacPhail, 2003). Trade shows, presentations, and competitions serve as platforms for displaying new products and may help spread information about the latest innovations (Hienerth, 2006).

Operational linkages derive from relational linkages as industry members become more familiar with one another and engage in formal and informal activities together. These linkages can strengthen relational linkages by providing opportunities to increase participation and interaction with club members. Sporting events create a unique setting for participants, one characterized by both camaraderie and competition. For example, Kuehn et al. (2006) studied the socialization process of anglers. A number of fishing participants indicated they enjoyed the sport for the camaraderie shared with other anglers as they learned about the sport (Kuehn et al., 2006). A similar study of youth track and field athletes revealed their club membership and participation was enhanced by interaction with athletes in a social setting (Kirk & MacPhail, 2003). Members of canyoning clubs used the sports organizations and events to solicit performance advice and share product information, particularly among those new to the sport. They held presentations and developed a website for all users. Additionally, the club supported trips

to participate in the sport and casual meet-and-greets at local bars for club members to interact in a non-sports setting (Franke & Shah, 2003). These activities represent operational linkages for recreational sports participants in non-competitive environments.

Operational linkages also exist for those who desire more competitive outlets. Franke and Shah (2003) found handcyclists participated in sporting events at national and international levels. The events included training sessions, seminars, and actual competitions. Participants said the events gave them the opportunity to connect and compete with other handcyclists on a regular basis. The interactions allowed them to share both competition and camaraderie (Franke & Shah, 2003). Participants may also share information about sporting goods innovations at such competitions. In his study of rodeo kayakers, Hienerth (2006) attended the Rodeo World Championships, where participants and manufacturers gathered to watch athletes perform. Manufacturers conducted presentations to display their latest innovations and solicit feedback and insights from current and potential customers. The event gave participants and other industry members the opportunity to discuss innovations and see the effects the products had on athlete performances (Hienerth, 2006).

Competitions also aid the dissemination of innovations. Participants watch their competitors perform. Athletes may attribute all or part of their successes or failures to the sporting goods they use (Gaviria, 2000). During a high innovation period in rodeo kayaking, a number of innovators introduced new boats, which helped them win multiple competitions and awards. The boats received significant attention--both from judges who attempted to limit their future usage and from competitors who hoped to purchase and parlay the same equipment into future wins (Hienerth, 2006). Gaviria studied track

cyclists and found a similar phenomenon repeated over a hundred years in the sport. Cyclists brought innovative bikes to events and won. Witnessing the successes of competitors, participants adopted the same innovations, leading to more wins on the track. Eventually, the majority of cyclists owned the once innovative bikes, and record-breaking performances declined with market saturation. A period of innovation and performance stagnation followed, until another round of innovation and performance gains began again (Gaviria, 2000).

Sporting good innovations can provide competitive advantage to athletes. Yet the very public nature of sporting events limits a competitor's ability to hide the secrets of success from other athletes. When an athlete wins, other athletes may seek out the same products in hopes of achieving victories. Sporting goods manufacturers also want to know more about the winning products in hopes of incorporating the same advantages into their own product offerings. Researchers have found the sport industry encourages the sharing of product information to a certain extent. For example, with canyoning and sailplaning, athletes were more likely to share information about the products they used. Those athletes who chose not to share were perceived by other participants as violating community norms and could be ostracized from the community--or at the very least, excluded from receiving information in the future (Franke & Shah, 2003). Rodeo kayakers shared information about their boats when the sport and the manufacturing markets were small. However, as more athletes and manufacturers received compensation for their respective performances and designs, the information sharing eventually tapered off (Hienerth, 2006).

Even when the stakes are at their highest, a certain level of information and innovation sharing still exists--voluntary or otherwise. For instance, as soon as Michael Phelps steps on the platform in a sponsored swimsuit, everyone--his competitors, media, spectators--know what equipment he is using. The public nature of sport prevents manufacturers from keeping their products secret. Arguably, they may even want participants to see their products associated with wins in hopes of increasing future sales. Unlike other consumer products manufacturers, sporting goods companies have limited legal protection for their innovations. Inventors may seek a patent or trade secret protection. However, "patents are not generally viewed as effective in the case of mechanical innovations--which is what sports equipment innovations tend to be" (Lüthje et al., 2005, p. 954). The open nature of sports competitions limits the use of trade secrets (Lüthje et al., 2005; von Hippel, 2007). As a result, innovators may rely more on "cooperation through competition," knowing their other options are limited (Read, 2000). This cooperation may facilitate the development of operational linkages as manufacturers and participants realize they have few options but to cooperate and communicate with other sport industry members. In fact, placing their products on display at activities and events may help the dissemination of their innovations.

Technological Linkages

Technological linkages are the third linkage type found in the sport industry. They are technical and electronic mechanisms. Examples include basic tools like paper and pencil and the telephone as well as e-mail and the Internet. These linkages are used to facilitate the formation of relational and operational linkages (Lasky, 2010). Individuals

like information providers can use the linkages to spread information about innovations (Valente, 1996).

Information providers utilize a myriad of sources to gather and spread information. Information technology analysts and researchers have noted the benefits of Internet based technological linkages in bringing individuals together and disseminating information and other resources (Gartner, 2008). Van Baalen et al. (2005) studied online information portal usage with government agencies. The portal allowed users to share relevant and complementary knowledge. Participants created stronger alliances as they generated useful information and worked on more common projects together over time (Van Baalen et al., 2005). Flynn (2005) researched listserv usage among librarians. Having access to the information resource made librarians feel connected to a larger group of librarians, increasing their desire to work with and share information with other participants over time (Flynn, 2005).

Other studies have examined the benefits of online communications. Lyons and Henderson (2005) measured the influence of information providers in online communities. The individuals exhibited higher levels of product knowledge and purchased products earlier than others online (Lyons & Henderson, 2005). Tsang and Zhou (2005) found information providers first gathered information, which they often received from online news outlets. They in turn provided the information to information seekers, who were comfortable receiving information through more personal interactions with information providers in offline settings (Tsang & Zhou, 2005). Sun, Youn, Wu, and Kuntaraporn (2006) also noted information providers sought information from a variety of sources, most likely those accessible online. They transmitted their information to

information seekers, who were again comfortable receiving information from these credible information providers (Sun et al., 2006).

Duan et al. (2008) studied the use of online blogs in transmitting reviews about movies. Reviews played a significant role in building interest among a wider viewing audience. The more people learned about the movies, the more they told others. This encouragement led to still more moviegoers learning about and attending the movies, increasing revenues for movie theaters and producers (Duan et al., 2008). Ko et al. (2008) found online reviews coupled with traditional media sources advanced the spread of information and raised box office receipts. After the films were released for general viewing at the theaters, stories from various communications channels increased exponentially (Ko et al., 2008).

Consumer products providers may benefit from using a combination of technological linkages to transmit information about their new products (Ko et al., 2008). Providing this information could influence the behaviors of online information seekers and facilitate the dissemination of innovations. The previous studies focused on consumer products like movies and wine, but the sport industry could also benefit from using technological linkages, particularly within an online environment. "Tribal and intense by definition, sport perhaps lends itself to social media better than any other genre" (Fisher, 2008, p. 1). Yet the industry as a whole has not realized fully the benefits technological linkages may offer (Fisher, 2008). After surveying its readership, *Sports Business Journal* found less than half of its respondents had either a Facebook or MySpace page (*Sports Business Journal*, 2008). Respondents recognized the importance of such sites for maintaining relationships with current sports consumers and reaching out to much-

coveted demographic groups (i.e., potential fans between the ages of 12 and 34). As a result, sports organizations, executives, athletes, and fans have embraced online social networks with a heightened fervor (Fisher, 2009).

Of the available online social networks, Twitter has become the vehicle of choice for sports organizations and athletes to connect with consumers (Fisher, 2009). For example, Allen Iverson kept fans abreast of his off-season conditioning and possible trade talks (Sheridan, 2009). Lance Armstrong posted a tweet, asking if anyone wanted to join him for a bike ride at a specified time. Several hours later, more than 1,000 cyclists showed up to participate (Cromwell, 2009). Sports managers are using Twitter to sell tickets, raise brand awareness, and promote products (Fisher, 2009). In challenging economic times, sports organizations seek increasingly novel ways to maximize fan contact and revenue streams while minimizing related expenses. Twitter and other online social networks are free to all users and may give organizations like sporting goods manufacturers a means to contact consumers and disseminate innovations (Fisher, 2009).

The previous studies illustrate the benefits of leveraging technological linkages. Combined with relational and operational linkages, technological linkages provide the tools industry members can use to connect with one another and exchange information and other resources. The personal connections of relational linkages may affect the dissemination process as individuals share information regarding the innovation with other industry members. The dissemination of innovations and information may accelerate a welcomed innovation--or thwart an unwelcome one. Operational linkages provide the settings for introducing innovations as organizations and their members participate in formal and informal activities. Club members express the enjoyment they

receive from interacting in sports and non-sports settings with other members and competitors. Manufacturers may display new goods and services at meetings and competitive events. Finally, technological linkages give organizations and their members the opportunity to connect in online settings, to share information, and discuss innovations.

Commitment

Within the sport industry, individuals who take advantages of the linkages may experience increased levels of commitment to their sports and sports clubs. This increased commitment may occur as participants enjoy their interactions with other sports participants via the linkages. "Commitment reflects factors supporting persistence in a course of action--even in the face of adversity" (Scanlan et al., 1993).

Commitment researchers have measured an individual's commitment to platonic and sexual relationships, work, and even donating blood (Scanlan et al., 1993). Meyer, Allen and Smith (1993) championed some of the more popular commitment research, focusing on occupational commitment and organizational commitment. Occupational commitment is the psychological attachment individuals have to their occupations, while organizational commitment reflects a similar attachment to organizations. The researchers divided the commitment construct into three commitment components: affective, continuance, and normative. Individuals with affective commitment stay in their current occupations or organizations because they receive personal enjoyment, while those with continuance commitment remain because they have no alternatives or

feel they have invested too much to leave. Individuals with normative commitment believe they should stay based on feelings of obligation and loyalty (Meyer et al., 1993).

Studies have shown a positive correlation between organizational commitment and job satisfaction and negative correlations with employee turnover and work absences (Meyer et al., 1993). Sports studies using the occupational affective scale with other occupational variables have also found positive correlations with job satisfaction (Pack, 2005) and career satisfaction (Cunningham, Sagas, Dixon, Kent, & Turner 2005) and a negative correlation with turnover intentions (Turner & Chelladurai, 2005). The findings have important implications for organizations seeking to keep employees satisfied while reducing job-related hiring and retention costs (Turner & Chelladurai, 2005). Researchers have examined the construct with various occupational groups such as university athletic administrators (Pack, 2005; Turner & Chelladurai, 2005), fitness club employees (Chang & Chelladurai, 2003), and sport administration college interns (Cunningham, Sagas, Dixon, Kent, & Turner, 2005).

Sport Commitment

While organizational and occupational commitment have been applied to the sport environment, researchers have created their own instruments to address the sport industry more specifically. Scanlan et al. (1993) said "sport commitment is defined as a psychological construct representing the desire and resolve to continue sport participation" (p. 6) and introduced the Sport Commitment Model (SCM) to measure sport commitment to a sports program, a particular sport, or sport in general. Items measuring sport commitment included "How dedicated are you to playing this sport?"

and "How hard would it be for you to quit?" Five antecedents were also hypothesized to predict sport commitment: 1) sport enjoyment ("Are you happy when you play this sport?"), 2) personal investments ("How much effort have you put into playing?"), 3) social constraints ("I feel I have to play this sport to please others"), 4) involvement opportunities ("I would miss playing this sport"), and 5) involvement alternatives ("How difficult was it for you to pick this sport over an alternative activity?") (Scanlan et al., 1993).

Sport commitment creates beneficial consequences for the sport industry. Individuals who enjoy playing a sport and interacting with other athletes may move from the status of casual participant to more dedicated athlete. This movement occurs as participants learn the requisite skills to begin participation. An increase in skill levels can lead to greater sport enjoyment and commitment to the sport. Participants may then spend more time and effort in their clubs, working with coaches, and training and competing (Kirk & MacPhail, 2003). Increased commitment is enhanced by the camaraderie of participating with others as well as access to clubs, sports-related information, and activities and events. Committed participants will make time to play in spite of busy schedules and other obligations (Kuehn et al., 2006). They are also more likely to purchase sporting goods to help them improve their performance (Casper et al., 2007; Howard & Havitz, 1995).

Higher levels of sport commitment can lead to greater involvement in the dissemination process as committed participants become innovators and information providers. For instance, Lüthje (2003) studied climbing and mountaineering, hiking, cross-country skiing, and mountain biking, sports chosen because they offer significant

recreational clubs and activities. Individuals identified as innovators expressed higher levels of commitment to the sport. They participated more often and in more than one of the four sports. They gathered sports product information from other participants as opposed to reading related periodicals or getting advice from sporting goods retailers. The interactions with participants in multiple sports allowed the innovators to make unique personal connections and sometimes led to the development of new products (Lüthje, 2003).

In their study of the kite-surfing industry, Tietz et al. (2004) found committed participants gathered information from multiple sources, including personal experiences associated with more frequent practices, longer sport tenure, communications with other seasoned participants, and knowledge derived from their sports and work experiences. Innovators often initiated new product innovations. They also purchased the innovations of innovators earlier than other participants. The study showed innovators may be critical to a successful product dissemination as they adopt the innovations of fellow innovators and spread information about them (Tietz et al., 2004).

Similarly, Lüthje et al. (2005) found users with higher participation rates created more new products. Almost a third of mountain bikers studied had generated a significant product idea, and almost half of those had created a prototype. Their ideas derived from personal experiences, frequent participation, and technical knowledge. The innovators benefited from their built-in R&D labs, which allowed them to gather and utilize product knowledge in a way traditional manufacturing firms could not. The innovators participated in a trial-and-error process every time they rode their bikes. This cost-effective innovation environment allowed them to test the viability of their innovations

before introducing them to larger audiences (Lüthje et al., 2005). Sport commitment can have a positive effect on the development and spread of new sporting goods and services.

Club Commitment

In addition to possessing sport commitment, participants can have commitment to a particular sports club. "The phenomenon of the club as a basic organizational unit in sport is as old as the origins of modern sport itself" (Kirk & MacPhail, 2003, p. 23). Sports clubs give their members the opportunity to connect with likeminded athletes and participate in sports via practices and competitive events (Kirk & MacPhail, 2003). New cyclists are encouraged by cycling magazines and other cyclists to join a club where they can learn more about the sport and improve their bike handling skills (Albert, 1999). Clubs may also provide non-sports activities to give members a chance to interact in a more relaxed setting (Kirk & MacPhail, 2003).

Club members provide a valuable source of revenue to clubs via their membership fees and participation in club events. Club leaders benefit from retaining committed members as opposed to spending scarce resources to attract new ones. Haggerty and Denomme (1991) defined club commitment as "an association between the individual and the organization such that members are willing to give something of themselves in order to contribute to the organization's well-being" (p. 59). The researchers created a survey instrument to measure club commitment with items like "It would be harder to find a more worthwhile club to join than this one" and "I feel that the club's activities are worthwhile" (Haggerty & Denomme, 1991).

Researchers have used other instruments and items to measure club commitment. For example, Franke and Shah (2003) measured club (or "community") commitment in their study of sports participants as innovators. They used three questions to measure the commitment variable: "I am a very active member of the community," "I get together with members of the community for activities that are not related to the sport (movies, dinner parties, etc.)," and "The community takes my opinion into account when making decisions" (Franke & Shah, 2003). Park and Kim (2000) modified the Allen and Meyer (1990) organizational commitment instrument to measure attitudinal loyalty to fitness clubs with items such as "I would be very happy to spend most of my leisure time with this program" and "It would be too costly for me to discontinue this program right now" (Park & Kim, 2000).

Increased levels of club commitment can have positive effects for the sport industry. Committed club members typically have more expertise regarding the sport and related goods and services (Lüthje, 2003). They have longer tenures with the sport and participate more frequently than less committed members. Committed members also tend to participate in a variety of club activities and events, including those which bring members together in social, non-sports settings. Members with higher commitment levels create more innovations, capitalizing on their extended experience and participation. They also express a willingness to share product information with other participants (Franke & Shah, 2003).

An increase in club participants and activities offered may lead to a larger number of relationships among club members (Nelson & Mathews, 1991; Pfeffer & Salancik, 2003; Provan, 1983). Operational linkages can help sustain or increase sport commitment

and club commitment. Sports providers may increase participation rates by offering more activities and opportunities, allowing participants to compete in various events, volunteer to host or support competitive events, and coach other club members. Participants with greater involvement may benefit from accelerated skill development and positive social support. These club participants often express higher commitment levels to their respective clubs and sports as a result (Albert, 1999; Alexandris, Zahariadis, Tsorbatzoudis, & Grouios, 2002; Casper & Andrew, 2008; Kirk & MacPhail, 2003; McGehee et al., 2003). As sport commitment and club commitment levels increase, participants may become more actively involved in the innovation process, seeking out information, creating their own products, and spreading information to others. Sporting goods manufacturers may create distinctive marketing strategies to reach different consumer groups based on the sport commitment and club commitment. Manufacturers will most likely want to contact those with the higher levels of both commitment types, targeting them for purchases of new innovations as well as using them to spread information about innovations to others (Funk & Pritchard, 2006; Park & Kim, 2000).

Product Involvement

Through information sharing, manufacturers hope sports participants will become aware of the latest innovations, leading them to learn more about the products and ultimately buy them. To measure the dissemination of innovations, manufacturers may use variables like product involvement and purchase intentions.

Product involvement is a facet of the more general involvement, which is defined as "an unobservable state of motivation, arousal, or interest. It is evoked by a particular

stimulus or situation and has drive properties. [Product involvement's] consequences are types of searching, information-processing, and decision making" (Kapferer & Laurent, 1986, p. 49). From this definition, the more specific product involvement represents a consumer's interest in a product, e.g., the relevance or amount of importance the product has to the individual (Kapferer & Laurent, 1986). As discussed previously, Berman and McLaughlin (1973) noted no matter how profound the innovation, if it does not have support from relevant industry members, it will not achieve its desired impact. Product involvement helps to quantify the level of support or interest members may have in a new good or service.

Product involvement represents the interest or interaction an individual has for a particular good or service. Zaichkowsky (1986) hypothesized involvement stemmed from three factors: personal, object or stimulus, and situational. Personal factors are an individual's needs or interests. Object or stimulus factors are the source and content of communication such as hearing about the product from a friend or through the media. Situational factors represent the heightened awareness an individual has about the product. The factors combine to create involvement, which can lead to behavioral outcomes such as searching for information about a product, considering alternatives, developing preferences for a specific brand, and finally purchasing the product (Zaichkowsky, 1986). Attitudinal product involvement expresses an individual's mental or emotional response to a product. Items measure the respondent's levels of pleasure ("This product is fun"), importance ("It is not relevant to me"), and sign value ("It helps me express my personality") (Bauer et al., 2006). Behavioral product involvement reflects an individual's physical response to a product and can be measured with items

like "I would be interested in reading about this product" and "I usually talk about this product with other people" (McQuarrie & Munson, 1992). Other behavioral responses are spreading positive information about the products, telling other people about them, making repeat purchases, and paying higher prices for the products (Cronin, Brady, & Hult, 2000).

Researchers have assessed product involvement with various consumer products such as clothing (Michaelidou & Dibb, 2006), calculators (McQuarrie & Munson, 1992), and cameras (Kapferer & Laurent, 1985). Consumers had higher levels of involvement with automobiles and televisions than with instant coffee and mouthwash (Zaichkowsky, 1985). Respondents expressed different reasons to explain their product involvement for different products. The reasons ranged from using the product to enhance self-image to enjoying the pleasure product usage brings to simply having an intrinsic interest in the product. Individuals with higher levels of product involvement are more likely to purchase the products. Manufacturers are encouraged to identify which reasons are most salient to potential purchases and emphasize those reasons to increase related spending (Kapferer & Laurent, 1985; Michaelidou & Dibb, 2006; Zaichkowsky, 1985).

In addition to the consumer product studies above, researchers have examined product involvement in the sport industry. Armstrong (2002) measured fan sport involvement for sporting events at historically black colleges and universities. Higher levels of involvement correlated with attending related sporting events at the academic institutions more often. Individuals viewed their involvement as an expression of self-concept and self-image. As such, school involvement was a more important determinant of game attendance than other game benefits like excitement (Armstrong, 2002). Bennett,

Ferreira, Lee, and Polite (2009) studied the relationship between action sports involvement and sponsorship effectiveness. Respondents with higher levels of involvement participated in the information exchange process more often, sharing and gathering information from other sports fans. Higher involvement levels also translated into participating and attending action sports events, playing sports-related video games, and purchasing related merchandise (Bennett et al., 2009).

Havitz and Howard (1995) used product involvement to develop sport participant usage profiles for golfers, windsurfers, and downhill skiers. Participants with higher levels of involvement were more likely to own their own equipment and to buy products year-round. They also subscribed to more magazines related to their sport of choice. Individuals with longer sport tenures had higher levels of involvement, although the authors noted involvement increased rapidly in the early years of participation and tapered off over time (Havitz & Howard, 1995). In their study of recreational road runners, McGehee et al. (2003) found a difference in runners with high levels of involvement versus those with lower levels, particularly in terms of processing information. Individuals who have high levels of involvement conduct more detailed information searches and spend more time gathering data from a variety of sources as well as reading and analyzing the collected information. As a result, their purchasing decisions are more informed. Highly involved participants may also purchase more sporting goods and spend more money traveling to and participating in sports events (McGehee et al., 2003). Increased levels of product involvement can aid manufacturers in their goal of spreading information about and selling more products.

Purchase Intentions

Along with product involvement, researchers have examined purchase intentions, which is a respondent's projected future purchasing behavior regarding a good or service. The variable often serves as a proxy for future sales and assesses whether the respondent would actually purchase the good or service and boost an organization's revenues. Increased sales are important to manufacturers and retailers who spend substantial resources to develop, market, and sell their products (Casper et al., 2007).

Sport studies frequently include the purchase intentions variable. Dees, Bennett, and Villegas (2008) measured the effect of sport sponsorship on purchase intentions. Respondents indicated an appreciation for companies which sponsored college football teams and events. These feelings translated into expressions of goodwill towards the company and an increased desire to purchase their products as a show of reciprocal support (Dees et al., 2008). Irwin, Lachowetz, Cornwell, and Clark (2003) found similar results with a charitable sporting event. Attendees viewed the event as serving an important purpose beyond entertainment. They indicated a greater willingness to purchase products from the event's corporate sponsor (Irwin et al., 2003). Miloch and Lambrecht (2006) examined sports participants, volunteers, and spectators at a grassroots sporting event. Those who perceived the event as important indicated higher purchase intentions of event sponsors (Miloch & Lambrecht, 2006).

Kwon, Trail, and James (2007) used purchase intentions to determine how team identification affected licensed merchandise spending for fans with high versus low levels of support for a team. Respondents with higher levels of team identification viewed the offered products as having high value related to their costs, and they had higher levels

of purchase intentions versus fans with lower levels. McGehee et al. (2003) quantified future sport tourism expenditures of recreational runners with high versus low involvement. Runners with higher levels of sport involvement also had higher levels of purchase intentions for sporting goods and sport tourism. Finally, Casper et al. (2007) measured the effect of sport commitment on the purchase intentions of recreational tennis players. Higher levels of sport commitment correlated with greater sport-related expenditures, including tennis balls, shoes, and racquets (Casper et al., 2007). Purchase intentions can help manufacturers project future sales, a key goal of introducing new products. The variable links to information seeking, sport commitment, and club commitment. Manufacturers may be well-served to influence these other variables to promote purchase intentions and the dissemination of innovations.

Summary of Literature

Woodside and Biemans (2005) stated, "the speed of diffusion is determined by the perceived attributes of the new product, the type of innovation decision, the communication channels employed, the nature of the social industry, and the extent of the change agents' promotion efforts" (Woodside & Biemans, 2005, p. 388). The current study's literature review examined variables important in the dissemination of innovations. Manufacturers want to provide innovations which will receive support from end consumers (Berman & McLaughlin, 1973). Additionally, they want potential customers to receive information about the new products to make informed decisions (Rogers, 2003).

This information can be transmitted through linkages. Relational linkages allow friends and sports participants to share information. Operational linkages like competitions and presentations feature innovations during formal sporting events and serve as another information source. Technological linkages give information seekers sources of valuable information via online and offline tools (Lasky, 2010). The linkages also give information providers an outlet through which to share their expertise with information seekers and gather information important to creating new products. These innovative individuals and participants with longer sport and club tenure often have higher levels of commitment to the sport and club. They are more likely to participate in the information sharing process (Baldwin et al., 2006; Schreier et al., 2007). Manufacturers need to understand how the variables operate in concert to favorably influence the dissemination of innovations.

CHAPTER III

METHOD

The study conducted a detailed examination of the dissemination of innovations within the sporting goods industry. This chapter outlines the study's research purpose and questions and how the research questions were answered using qualitative and quantitative designs and analyses.

Research Purpose

The purpose of the current study was to examine the role of communication in the dissemination of innovations. The study focused on linkages in the communication process as the vehicles through which information about innovations is spread.

(1) The study analyzed three linkage types--relational, operational, and technological--and their individual and combined effects on the dissemination of innovations, operationalized as product involvement and purchase intentions.

(2) The study also explored innovation type and whether an innovation as a good or service had an effect on an individual's decision to learn more about or purchase an innovation.

(3) Finally, the study examined the roles of sport commitment and club commitment, assessing the effects of an individual's commitment to a sport or to a sports club on the dissemination process.

To achieve the research purpose and answer the research questions below, the study employed a multi-method approach. Research questions were developed to achieve the research purpose and explain the effects of the variables in the dissemination of innovations within the cycling industry.

Research Questions and Hypotheses

To achieve the research purpose, the following research questions and hypotheses were addressed. The four independent variables and their levels were as follows: linkage type (relational, operational, technological), innovation type (good, service), sport commitment (low, medium, high), and club commitment (low, medium, high). The two dependent variables were product involvement and purchase intentions. The four research questions below address the main and interaction effects of the four independent variables and the two dependent variables.

1. What is the effect of linkage type (relational, operational, technological) on the dissemination of innovations (product involvement, purchase intentions)?

1a. There is a significant main effect of linkage type on product involvement.

1b. There is a significant main effect of linkage type on purchase intentions.

2. What is the effect of innovation type (good, service) on the dissemination of innovations (product involvement, purchase intentions)?

2a. There is a significant main effect of innovation type on product involvement.

2b. There is a significant main effect of innovation type on purchase intentions.

2c. There is a significant interaction effect between linkage type and innovation type on product involvement.

2d. There is a significant interaction effect between linkage type and innovation type on purchase intentions.

3. What is the effect of sport commitment (low, medium, high) on the dissemination of innovations (product involvement, purchase intentions)?

3a. There is a significant main effect of sport commitment on product involvement.

3b. There is a significant main effect of sport commitment on purchase intentions.

3c. There is a significant interaction effect between linkage type and sport commitment on product involvement.

3d. There is a significant interaction effect between linkage type and sport commitment on purchase intentions.

4. What is the effect of club commitment (low, medium, high) on the dissemination of innovations (product involvement, purchase intentions)?

4a. There is a significant main effect of club commitment on product involvement.

4b. There is a significant main effect of club commitment on purchase intentions.

4c. There is a significant interaction effect between linkage type and club commitment on product involvement.

4d. There is a significant interaction effect between linkage type and club commitment on purchase intentions.

Study Participants

The current study examined the dissemination of innovations within the sporting goods industry. Focusing on the sport of cycling, the study explored linkages present within the cycling industry and how the linkages may influence a cyclist's decision to learn about and purchase innovations. As a result, it became important to understand the responses of those most likely to purchase cycling sporting goods--cycling participants. Cyclists can be found in numerous areas, riding their bikes around town and in parks, racing in local and regional events, participating in cycling clubs and group rides, purchasing cycling goods and services at local bike shops, and attending trade shows and other cycling events.

The current study elected to gather data from individuals participating in cycling clubs. Sports club members have frequently been the focus of research studying sports participation. Studies have examined club members from sports like tennis (Casper & Andrew, 2008; Casper et al., 2007); handcycling, boardercross, canyoning, sailplaning (Franke & Shah, 2003); running (Kirk & MacPhail, 2003; McGehee et al., 2003); and mountain biking (Lüthje, 2003). Sports clubs offer members a range of activities like group rides, educational sessions, and community service events. Clubs are also important in the cycling industry. "Cycling publications routinely advise novices to 'find a group ride at their local bike shop' or to 'join a local bike club' as a way of getting involved in the sport" (Albert, 1999, p. 161). The clubs serve as a socializing agent for new riders learning how to ride safely on public roads and with others. The clubs also provide more experienced and veteran members with opportunities to spend time with

likeminded participants on and off the bike. The clubs attract a variety of cyclists, representing different ages, genders, and sport participation and club tenure.

The cycling club targeted in the current study is located in Louisville, Kentucky. Louisville has a large cycling community and was named one of America's Most Improved Cities for Bicycling (Fiske, 2008). The city hosts several major cycling events, including the Ford Ironman triathlon and the US Gran Prix of Cyclocross Derby City Cup (Fiske, 2008). The city offers various online and offline social opportunities for cyclists. Online communities include KyCycList, a listserv where riders can post and respond to questions about group rides and training techniques (Louisville Bicycle Club, 2009). Offline communities include seven local bike shops, which sell cycling specialty equipment (Louisville Metro Government, 2009). The city also has several cycling clubs: the River City Cycling Society, the Rogue Racing Project, and the Louisville Bicycle Club (LBC).

The latter group began in the late 1890s and has over 1,000 members. LBC offers participants a variety of activities such as bicycle advocacy and education opportunities. The club provides regular group rides. LBC also sponsors a competitive racing team and hosts the Old Kentucky Home Tour (OKHT), an annual two-day bike ride from Louisville to Bardstown, Kentucky. Additionally, LBC partnered with Humana, Inc. to host the 2009 Bike Summit II, an initiative to promote cycling, increase community engagement, and build support for new bike lanes across the city. The club's executive committee provides support for the various activities, and the leadership team consists of a president plus vice presidents for advocacy, communications, education, racing, and touring. The club also has a treasurer, secretary, and a director of the OKHT (LBC,

2009). Because of its formal organizational structure, local presence, and size, LBC served as the study's primary focal point. A large and well-established club may provide access to members who reflect a wide range of demographic groups (e.g., age, gender, sport participation, and club tenure).

Access to the club and its members was facilitated through a personal connection. I have been a club member since December 2008. Being a club member can introduce advantages and disadvantages. In his ethnographic study of cyclists, Albert (1999) spent most of his time interviewing and engaging with other cyclists on club rides. He credited his insights to "a store of insider knowledge I have accumulated as both a researcher and participant in recreational cycling and racing" (Albert, 1999, p. 160). Previous experience with the club and its members can potentially provide useful insights about the club like which members from whom to collect data and how to best reach them (e.g., club events, listserv, newsletter). Club membership may facilitate initial entry into the club to gather data. Club leaders may be more willing to allow a club member to collect data, and club members may be more inclined to provide the requisite information. They may be more responsive to a club member versus a complete stranger. Yet disadvantages exist with collecting data from club members. For instance, biases may be introduced into the research. A researcher as a club member may wish to place the club in the best light possible, emphasizing positive study results while downplaying negative ones. Club members may be reluctant to provide sensitive information which portrays themselves or the club in a negative light, particularly if they question the anonymity of responses collected (Patton, 2002).

To counter the potential disadvantages in the current study, club members were provided a protocol which emphasized confidentiality during the qualitative interview process. Complete anonymity was assured with the quantitative survey collection. The LBC president was contacted and asked for his permission to interview and survey club members. Copies of the research protocol and research questions were given to him, and he granted permission via e-mail in May 2009. Requisite documents were then submitted to the University of Louisville's Institutional Review Board, which granted permission to proceed with the study in September 2009.

Sampling

A total of 25 club members were interviewed for the qualitative data collection. Interviewees included club members with longstanding memberships and significant institutional knowledge. At the other end of the spectrum, newer riders with less than a year of riding or club experience were chosen to provide different perspectives about the club and the cycling industry. Interviewees were selected purposefully from the membership subsets as well as mix of other demographic variables like age and gender and were asked about their willingness to participate in an interview.

A small subset of club members was used for the qualitative data collection. The entire LBC membership was chosen to complete the quantitative survey. Responses received during the qualitative analysis and incorporated into the subsequent survey would be most relevant to other LBC members. The survey population represents "all of the units to which one desires to generalize survey results" (Dillman, 2007, p. 196). In the current study, the survey population included all cyclists residing in the United States.

The sample frame is defined as the "list from which a sample is to be drawn in order to represent the survey population" (Dillman, 2007, p. 196). The club publishes a directory, which lists all of the club members and their contact information. Using the directory to create a list of potential respondents (e.g., every fifth member listed) would represent a sampling frame. However, LBC has a formal policy restricting the use of its membership roster to club-related activities. Selecting members from the directory and distributing surveys to them was eliminated as a viable sampling and distribution option. Instead, the study used a convenience sampling method, and the entire club was included in the sample.

Generally speaking, the convenience sampling technique has certain disadvantages, including results reflective of a unique sample and a limited ability to generalize the results to the population (McMillan & Schumacher, 2006). The study attempted to minimize the disadvantages in two ways. First, club demographic data were obtained from the club treasurer. The information was compared to demographic data collected from respondents to ensure the sample reflected the larger sampling frame and no statistically significant differences existed between respondents and non-respondents. Second, data were collected from a wide variety of respondents from different club demographic groups such as age, gender, participation tenure, and weekly club participation. As noted in the limitations section, the responses from members of this club may not reflect responses provided by members of other cycling clubs. The study's sample is defined as "all units of the population that are drawn for inclusion" (Dillman, 2007, p. 196) and would consist of members chosen to participate in the study (i.e., those participating in club rides and other club-related activities). Because of the sampling

limitation, caution should be use when generalizing the results of the study back to the larger survey population (Dillman, 2007).

The study's minimum required sample size was determined using two separate calculations. Based on the club's population of 1,071 members, Dillman (2007) suggests a sample of size of 275 to attain a 95% confidence level. To achieve adequate statistical power, Stevens (2002) suggests a minimum of fifteen cases be used for each predictor variable. The current study contained 18 cells when combining either sport commitment (low, medium, or high) or club commitment (low, medium, or high) with innovation type (good or service) and linkage type (relational, operational, or technological). This translates to a minimum of 270 responses required. Taking the larger of the two numbers, the current study attempted to collect completed and usable surveys from at least 275 members. The club has over 1,000 members. It was estimated 30% of members would respond to the survey, yielding at least 300 respondents (Dillman, 2007). This sample size would be large enough to achieve statistical power, conduct statistical analysis, and generalize to the larger population. Therefore, the entire population of club members was contacted to attain an adequate number of responses.

Qualitative Design and Analysis

The study employed a combination of qualitative and quantitative design and analysis. The primary purpose of the qualitative analysis was to identify cycling innovations and linkages important to club members. Those mentioned most often by interviewees were incorporated into scenarios used during the subsequent quantitative analysis.

Information from 25 club member interviews was used to develop the survey scenarios. During the interviews, club members were asked to list innovations, whether goods or services, most important to them. They were also asked to describe how they learned about the innovations via various linkages. Prior to the interviews, selected club members were informed of the confidentiality agreement and storage procedure. They were also told they may decline to answer any question and may elect to terminate the interview at any point during the interview process. Interviewees received a copy of the research protocol, acknowledged their understanding of the research, and granted permission to use their responses. They were asked the following questions:

1. What innovations have you heard about in the cycling industry?
2. Are these innovations important to you? Why or why not?
3. How do you learn about innovations?
4. Which sources have the most influence on your decision-making process?
5. Which sources have the least influence on your decision-making process?
6. What goes into your decision-making process to accept or reject an innovation?

Interviews spanned five to ten minutes. A digital tape recorder was used to record the data. Handwritten notes were also used in the data collection process. Once the interviews were completed, they were transcribed. Interview transcriptions were stored on a personal laptop. All respondents were identified by initials, and initial codes were stored in a separate document. Hard copies of the transcripts were stored in a secure location within a home office. Digital recordings were erased after the interviews were transcribed. Soft and hard copies of the transcripts will be destroyed five years after the study's completion.

A source table was prepared to outline and categorize the data (e.g., data source, innovation types and linkage types listed). The collected interviews were read and reviewed multiple times. The first iteration provided a general overview of the information gathered as it related to the innovations and linkages listed by interviewees. The interviews were then re-read and coded based on the innovations and linkages. A frequency table was created to determine which innovation types and linkage types were listed most often. Interview data were triangulated with two international cycling magazines, *Bicycling* and *VeloNews*. Triangulation is used in qualitative research to cross-check data results across several sources and strengthen the reliability of the findings. Using multiple sources to gather information about the same phenomenon may prevent researchers from drawing possible erroneous conclusions when relying on one source. Confidence in the findings may increase as a variety of sources report the same or similar information (Patton, 2002). The purpose of triangulation in the current study was to determine whether the innovation type and linkage type chosen most often by interviewees proved similar to ones mentioned in two major cycling magazines. *Bicycling* caters its articles towards a US-based recreational readership (*Bicycling*, 2009), while *VeloNews* targets more serious amateurs and professional riders and provides coverage about international cycling events (Competitor Group, Inc., 2009). Rather than relying on club members alone or one magazine, information was drawn from the three sources. Multiple mentions of the innovations from the source may indicate the innovations chosen had wide application across a variety of cyclists based on demographic groups like age, gender, and participation tenure.

The innovations listed most often were a cycling-specific GPS (global positioning system) device (good) and customized training services (service). The innovations have been covered frequently within major cycling publications. *Bicycling* awarded the GPS device its "Gear of the Day" accolade in October 2008. "If you're heading out for a mountain ride that you've scoped out on Bicycling.com and you're not sure where it really goes, then the Edge 705 [the most popular GPS model] is your best friend" (*Bicycling*, 2008, p. 1). A *VeloNews* writer noted Tour de France cyclists also use the device. Some professional riders have suggested new product features such as music and cellular phone capabilities and maps for international rides. Engineers from the GPS manufacturer have promised to introduce updated devices with expanded features in the future (Frothingham, 2009). Regarding the coaching services, *Bicycling* has advocated the use of personal coaches for improved performance. One of the magazine's staff writers discussed her own search for a personal coach. "Having someone tell you exactly what to do can save valuable time and energy.... More importantly, having someone push me to do the stuff I hate will keep me honest and make me better. Maybe lots better" (Yeager, 2007, p. 1). *VeloNews* also supports customized training for recreational riders. "Athletes that are willing to put some thought and dedicate some time into designing a personal training strategy can be quite successful, more so than just riding around and hoping your form comes around" (Overton, 2009, p. 1). The innovations selected by club members echoed innovations discussed frequently by the cycling publications in print and online. This consensus may indicate the innovations chosen for the survey instrument were applicable for those completing the survey. The good and service included have been discussed in and by a variety of sources, so club members may be more familiar with the

products and have the ability to make an informed decision regarding their personal product involvement and purchase intentions.

Along with identifying pertinent innovations, participants also listed how they learned about the innovations via specific linkages. The linkages mentioned most often were hanging out with friends (relational), attending a cycling-specific presentation (operational), and visiting cycling-specific website online (technological). The innovation types and linkage types were used in the next phase of design and analysis.

Quantitative Design and Analysis

In addition to qualitative research, the study used quantitative design and analysis. The survey instrument addressed the innovation types and linkage types identified above via scenarios and incorporated items from the Sport Commitment Model (Scanlan et al., 1993) and the Haggerty and Denomme (1991) club commitment scale. The quantitative analysis helped to answer the research questions regarding the roles innovation type, linkage type, sport commitment, and club commitment play in the dissemination of innovations.

Scenarios

Scenarios were used to answer the research questions about innovations and linkages. To construct the scenarios, the study drew upon the qualitative results with the innovation types and linkage types listed most often during the semi-structured interviews. The manipulated variables were innovation type (good or service) and linkage

type (relational, operational, or technological). Combining one innovation type with one linkage type in each scenario led to the creation of six possible scenarios.

Scenario #1: *Hanging out with a group of friends*, you and others start to discuss the newest innovations featured during the Tour de France. Several friends mention new *cycling-specific GPS (global positioning system) devices*. Your friends discuss the features and benefits, including improved cycling performance.

Scenario #2: Prior to a club ride, *a presentation* is given regarding the newest innovations featured during the Tour de France. Featured are new *cycling-specific GPS (global positioning system) devices*. The presentation discusses the features and benefits, including improved cycling performance.

Scenario #3: While online, you go to several *cycling websites* which discuss the newest innovations featured during the Tour de France. Several websites mention the new *cycling-specific GPS (global positioning system) devices*. The websites discuss the features and benefits, including improved cycling performance.

Scenario #4: *Hanging out with a group of friends*, you and others start to discuss the newest innovations featured during the Tour de France. Several friends mention new *customized training services*. Your friends discuss the features and benefits, including improved cycling performance.

Scenario #5: Prior to a club ride, *a presentation* is given regarding the newest innovations featured during the Tour de France. Featured are new *customized training services*. The presentation discusses the features and benefits, including improved cycling performance.

Scenario #6: While online, you go to several *cycling websites* which discuss the newest innovations featured during the Tour de France. Several websites mention the new *customized training services*. The websites discuss the features and benefits, including improved cycling performance.

Each survey contained one scenario. After reading the scenario, respondents answered questions about their product involvement and purchase intentions regarding the innovation good or service.

Scenarios have been used previously in sport-related research. For example, Greenwell, Brownlee, Jordan, and Popp (2008) used a scenario in their study to measure customer satisfaction with student ticket prices. The researchers used the scenario to isolate key influences of customer satisfaction and measure potential reactions to the influencers (Greenwell et al., 2008). Cianfrone and Zhang (2006) used scenarios to measure the effectiveness of television advertisements and large signs inside the stadium on brand recall, while Fink, Cunningham, and Kensicki (2004) examined the effect of product endorsements on purchase intentions using scenarios. Likewise, Kyle, Kerstetter, and Guadagnolo (2003) incorporated scenarios to measure a respondent's willingness to pay increased fees to support a 10K race. Fink, Parker, Brett, and Higgins (2009) created fictitious news stories as scenarios to study the effects of negative news on fan identification. Carlson and Donovan (2008) developed scenarios to assess the role of athlete endorsements and team identification on future purchasing behaviors. Patrick, Mahony, and Petrosko (2008) utilized scenarios to assess the perceived fairness of financial decisions made within a collegiate athletic department.

Scenarios were viewed as appropriate in the current study to assess potential responses to new sporting goods and services. Innovation studies often examine an innovation after it has disseminated through the system. For example, Stern's (1979) study of the NCAA tracked the organization's rise to power from its inception in 1910. With a retrospective analysis, researchers must consider every possible factor potentially influencing the dissemination of the innovation such as the innovation itself, individuals and organizations within the industry, and environmental factors (Lampela & Kärkkäinen, 2008; Read 2000). Tracking a change from the beginning can prove difficult. Researchers need to first recognize a change exists and then predict its likely movement through an industry. Lampela & Kärkkäinen (2008) noted it can sometimes take years or even a decade to recognize an innovation as such. Scenario usage addresses these challenges by presenting a single innovation and asking survey participants to predict their responses to it. For example, Shih and Venkatesh (2004) measured product interest in high-tech home technologies by presenting a fictional product for consideration. They measured participant responses to a hypothetical refrigerator which could monitor food supplies and automatically place orders for low-inventory items. Scenarios allow researchers and survey participants to think beyond what is currently available to what could be and assess responses to the proposed innovations (Schoemaker, 1993).

Scenarios also purposefully limit the possible variables under examination. Scenarios have been used in a variety of sports studies as well as strategic management (Schoemaker, 1993), health services (Angst & Agarwal, 2009), service management (Mattila & Cranage, 2005), and transportation (D'Arcier, Andan, & Raux, 1998). In each

study, a multitude of variables were available for study. Researchers instead chose a select few to explore in more detail. Arguably, this approach limits the realism of the analysis. "Scenarios offer a compromise between the theoretical ideal of completeness, formalism, and objectivity on the one hand and most managers' desires to keep matters concrete, manageable, and relatively simple on the other" (Schoemaker, 1993, p. 1999). Selecting a smaller number of variables serves to reduce complexity in the analysis and allows researchers to focus on the key variables and effects which best address the study's purpose.

Sport Commitment

In addition to scenarios, the survey instrument contained questions regarding sport commitment. Scanlan et al. (1993) introduced the Sport Commitment Model (SCM) to measure commitment to sports programs, a specific sport, and sport in general. The survey instrument contained nineteen items in total. The instrument was divided into five sections to measure sport commitment and its four hypothesized antecedents: 1) sport enjoyment, 2) personal investments, 3) social constraints, and 4) involvement opportunities.

In their initial study, Scanlan et al. (1993) measured sport commitment with four items. The first item asked "How dedicated are you to playing the sport?" and was measured using a five-point response format, ranging from 1 for *Not at All Dedicated* to 5 for *Very Dedicated*. The second item asked "How hard would it be for you to quit the sport?" and was measured using a five-point response format anchored by 1 for *Not at All Hard* to 5 for *Very Hard*. The third item asked "How determined are you to keep playing

the sport?" and was assessed using a five-point response format ranging from 1 for *Not at All Determined* to 5 for *Very Determined*. The final item asked "What would you be willing to do to keep playing the sport?" The items was measured using a five-point response format ranging from 1 for *Nothing at All* to 5 for *A Lot of Things* for item four. Respondents answering the sport commitment items could attain a minimum score of four and a maximum score of 20.

Continuing the Scanlan et al. (1993) study, the researchers used sport commitment as the dependent variable. They examined the effects of four antecedents on the variable. Sport enjoyment was measured with four items ("Do you enjoying playing the sport?"), while personal investments was measured with three items ("How much of your time have you put into playing the sport this season?"). Social constraints had four items ("I feel I have to play the sport so that I can be with my friends") as did involvement opportunities ("Would you miss your head coach if you left the sport?"). Again, survey participants were asked to indicate their responses to the items using a five-point response format ranging from 1 for *Not at All* to 5 for *Very Much*. The four antecedents were hypothesized to correspond positively with sport commitment (Scanlan et al., 1993).

The researchers tested their proposed model by surveying participants in youth softball and baseball leagues. Existence of adequate internal consistency reliability was assessed using an internal consistency reliability coefficient threshold of .70 deemed "acceptable" by Nunnally (1978) (as cited in DeVellis, 2003). All of the subscales achieved Cronbach's alphas surpassed the threshold except personal investment, which had an alpha of .50. The sport commitment scale had an internal consistency reliability

coefficient of .85, sport enjoyment of .94, social constraints of .80, and involvement opportunities of .81, all surpassing the acceptable threshold (Scanlan et al., 1993).

The authors also reported high correlations between sport commitment and sport enjoyment ($r = .71, p < .0001$) and between sport commitment and personal investments ($r = .53, p < .0001$). A stepwise multiple regression equation was significant at the .01 alpha level, where $F(2, 161) = 111.000, p < .0001$ and $R^2 = .58 (p < .0001)$. Fifty-eight percent of the variance in sport commitment was explained by sport enjoyment ($\beta = .61, p < .0001$) and personal investments ($\beta = .36, p < .0001$). A one unit increase in sport enjoyment would lead to a .61 unit increase in sport commitment. Similarly, a one unit increase in personal investments would lead to a .36 unit increase in sport commitment. Social constraints and involvement opportunities did not contribute significantly to the overall variance explained in sport commitment. The researchers concluded the survey instrument provided an appropriate tool for measuring sport commitment and welcomed future researchers to test the model in other settings and with other sports (Scanlan et al., 1993).

Additional studies followed. Researchers studied fitness and health club members (Alexandris et al., 2002), tennis club members (Casper & Andrew, 2008; Casper et al., 2007), youth female handballers (Guillet, Sarrazin, Carpenter, Trouilloud, & Cury, 2002), youth soccer participants (Sousa, Torregrosa, Viladrich, Villamrin, & Cruz, 2007), and youth female gymnasts (Weiss & Weiss, 2007). Part of their analyses included testing the internal consistency reliability and construct validity of the SCM survey instrument. Alexandris et al. (2002) reported subscale internal consistency reliability coefficients which either met or exceeded the .70 or greater threshold for all five subscales. The sport

commitment scale had an internal consistency reliability coefficient of .86, personal investment of .71, sport enjoyment of .90, social constraints of .70, and involvement opportunities of .76. The researchers conducted a confirmatory factor analysis to test the construct validity of the instrument. The threshold values used to test adequate fit were .90 or greater for CFI and NFI, and .06 or smaller for RMSEA, according to the threshold minimums set by Hu and Bentler (1999). The researchers reported good fit with the model for all outcomes but NFI, which did not meet the .90 threshold ($X^2 = 189.36$, $df = 133$, $p < .001$, CFI = .948, NFI = .848, RMSEA = .059) (Alexandris et al., 2002). The subsequent regression equation was statistically significant at the .001 alpha level, where $F = 27.3$, $p < .001$ and $R^2 = .44$ ($p < .0001$) [degrees of freedom not provided]. Forty-four percent of the variance in sport commitment was explained by involvement opportunities ($\beta = .40$, $p < .001$), personal investment ($\beta = .27$, $p < .001$), sport enjoyment ($\beta = .20$, $p < .005$), and social constraints ($\beta = .14$, $p < .05$). Involvement opportunities had the highest explanatory power in sport commitment. A one unit increase in involvement opportunities would lead to a .40 unit increase in sport commitment. Personal investments had the second highest explanatory power. A one unit increase in personal investments would lead to a .27 increase in sport commitment. Sport enjoyment had the third highest explanatory power in sport commitment (a one unit increase in sport enjoyment would lead to a .20 increase in sport commitment) followed by social constraints with the lowest of the four independent variables, whereby a one unit increase in social constraints would lead to a .14 increase in sport commitment (Alexandris, 2002).

Casper et al. (2007) also tested the internal consistency reliability and construct validity of the instrument. The four subscales had internal consistency reliability

coefficients which exceeded the .70 threshold established by Nunnally (1978). The coefficient alphas were as follows: sport commitment .85, personal investment .76, sport enjoyment .83, social constraints .72, and involvement opportunities .74. The authors included two additional subscales to measure investment alternatives ("How interesting would alternative activities be?") and social support ("Other people encourage me to play"). The researchers reported adequate coefficient alphas for the subscales with .71 for involvement alternatives and .74 for social support. The researchers used structural equation modeling to test the fit of the SCM, measuring how well the six predictor variables explained sport commitment. The researchers reported the following results: $X^2 = 1655.35$, $p < .05$, CFI = .95, NFI = .90, RMSEA = .078) [degrees of freedom not reported]. While CFI and NFI met or exceeded the threshold of .90, RMSEA did not meet the requisite guidance of .05 or lower. Ninety-eight percent of the variance in sport commitment was explained by the six predictor variables of personal investment ($\beta = .43$, $p < .05$), sport enjoyment ($\beta = .42$, $p < .05$), involvement opportunities ($\beta = .29$, $p < .05$), social support ($\beta = .12$, $p < .05$), social constraints ($\beta = .09$, $p < .05$), and involvement alternatives ($\beta = .01$, $p < .05$). A one unit increase in personal investments would lead to a .43 increase in sport commitment. [No F or degrees of freedom provided]. Personal investment had the highest explanatory power of sport commitment. A one unit increase in personal investment would lead to a .43 increase in sport commitment. Similarly, a one unit increase in sport enjoyment would lead to a .42 increase in sport commitment. For involvement opportunities, a one unit increase in the variable would lead to a .29 increase in sport commitment. For social support, a one unit increase would lead to a .12 increase in sport commitment. A one unit increase in social constraints would lead a .09 increase

in sport commitment. Finally, a one unit increase in involvement alternatives would lead to a .01 increase in sport commitment. The authors also found sport commitment had a positive and statistically significant correlation with participation frequency ($r = .326, p < .01$) and purchase intentions ($r = .339, p < .01$) (Casper et al., 2007).

Sousa et al. (2007) conducted similar tests to assess the internal consistency reliability and construct validity of the SCM instrument. For the subscales, they reported internal consistency reliability coefficients of .76 for sport commitment, .41 for personal investment, .88 for sport enjoyment, .80 for social constraints .72, and .52 for involvement opportunities. Like Casper et al. (2007), they also measured involvement alternatives and reported a Cronbach's alpha of .66 for the subscale. Because of the poor internal consistency reliability scores for personal investment and involvement alternatives items, the researchers chose to eliminate them from further examination. They used structural equation modeling to test the fit of the remaining scales in the model. The authors deemed the model an adequate fit ($X^2 = 597.711, df = 184, p < .001$, CFI = .885, NFI = .843, RMSEA = .072), although none of the values met the thresholds established by Hu and Bentler (1999). The resulting regression equation explained 59% of the variance in sport commitment at the .01 alpha level [no F or degrees of freedom provided]. Only two of the predictor variables were statistically significant, sport enjoyment ($\beta = .56, p < .001$) and involvement alternatives ($\beta = -.40, p < .001$). Sport enjoyment had the highest explanatory power in explaining the variance in sport commitment. A one unit increase in sport enjoyment would lead to a .56 increase in sport commitment. Involvement alternatives had the second highest explanatory power,

whereby a one unit increase in the variable would lead to a .40 decrease in sport commitment (Sousa et al., 2007).

The studies provided mixed results regarding whether the various independent variables adequately predicted or explained sport commitment. Sport enjoyment consistently explained the most variance in sport commitment with statistically significant standardized beta coefficients ranging from .20 (Alexandris et al., 2002) to .61 (Scanlan et al., 1993). Unlike its antecedents, the sport commitment subscale had items with internal consistency reliability coefficients consistently above the .70 threshold established by Nunnally (1978). Researchers reported acceptable internal consistency reliability coefficients for the sport commitment subscale, ranging from .76 (Sousa et al., 2007) to .86 (Alexandris et al., 2002). Based on these results, the SCM sport commitment scale was used in the current study. The four items from the original SCM were modified to measure sport commitment within the cycling industry. The items used were as follows: 1) "I am dedicated to cycling," 2) "It would be hard for me to quit," 3) "I am determined to keep cycling," and 4) "I would be willing to do anything to keep cycling." Survey participants were asked to respond to each item using a seven-point response format ranging from *strongly disagree* (1) to *strongly agree* (7).

Club Commitment

Haggerty and Denomme (1991) studied club commitment and its antecedents. Six items were used to measure club commitment: 1) "It would be harder to find a more worthwhile club to join than this one," 2) "If all other factors would permit me, I intend to remain in the club," 3) "I feel that the club's activities are worthwhile," 4) "I can see

how my input to the club contributes to its overall success," 5) "I am proud of the club to which I belong," and 6) "I look forward to club activities." The items were taken from the DeCotiis and Summers (1987) study, which utilized nine items to assess organizational commitment. To test the construct validity of the instrument, Haggerty and Denomme completed a principal components factor analysis. The nine items loaded onto two components. The first component with the six items above had an internal consistency reliability coefficient of .83, which exceeded the .70 threshold deemed acceptable by Nunnally (1978). The six items accounted for 42% of the variance in organizational commitment. The researchers described the second component as "not interpretable" and opted not to use the remaining nine items.

Respondents completing the survey belonged to university-based recreational sports clubs. Club commitment served as the study's dependent variable. Independent variables were derived from a separate factor analysis. The authors culled items from previous sports club studies and divided them into two categories--importance of club benefits (16 items) and club emphasis (15 items). The researchers conducted a factor analysis for both categories and found a more parsimonious four-factor solution for importance of club benefits (management, enjoyment, physical, and status) and a three-factor solution for club emphasis (social, delivery, status) (Haggerty & Denomme, 1991).

Haggerty and Denomme combined the seven factors above with club participation tenure, levels of physical activity and skill, self-motivation, and gender and used a stepwise multiple regression analysis to measure the effects of the eleven independent variables on club commitment, the dependent variable. The resulting stepwise multiple regression equation generated an R^2 of .353, where $F(8, 317) = 21.62, p < .001$. The

eleven factors explained 35% of the variance in club commitment. Three factors had positive beta coefficients and were statistically significant at the .001 alpha level. The management factor contained items like "frequent gathering" and "warm, friendly club atmosphere" and had a beta of .45. Management had the highest explanatory power of club commitment. A one unit increase in the variable would lead to a .45 increase in club commitment. Delivery had items such as "physical challenge" and "improvement of skill" with a beta of .22. The variable had the second highest level of explanatory power for organizational commitment, whereby a one unit increase in delivery would lead to a .27 increase in club commitment. Finally, social included items like "opportunity to meet new people" and "opportunity to be with friends" and had a beta of .20. A one unit increase in social would lead to a .20 increase in club commitment. Social had the third highest explanatory power in explaining organizational commitment. The authors encouraged future researchers to use the same items listed at the beginning of the section and factors with other sports clubs. The current study incorporated the six commitment items to measure club commitment (Haggerty & Denomme, 1991). Survey participants were asked to respond to each item with a seven-point response format from *strongly disagree* (1) to *strongly agree* (7).

Sport commitment and club commitment were measured originally as continuous variables but were converted to categorical variables by dividing respondents into three equal groups (low, medium, high) based on their sport commitment and club commitment scores. Survey participants responded to four items gauging their sport commitment and six items assessing their club commitment. A respondent's sport commitment mean score was calculated by taking the average score for the four sport commitment items.

Similarly, a respondent's club commitment mean score was calculated by taking the average score for the six club commitment items. Respondents were then divided into three approximately equal groups based on the distribution of mean scores for all respondents. Those with the lowest sport commitment mean scores, or a third of respondents, were placed into the low sport commitment group, while those with the next highest mean scores, or another third of respondents, were placed into the medium sport commitment group. Finally, those with the highest mean scores, or the final third of respondents, were placed into the high sport commitment group. A similar exercise was completed to divide respondents into low, medium, and high club commitment groups.

Pedhazur (1997) argued using categories injects subjectivity into the data analysis. He recognized the potential need to categorize respondents to use statistical tools like factorial ANOVAs. Yet he noted the limitations created by this technique and advocated strongly against using it. According to the author, categories lead to information loss. Rather than examining the breadth of responses from survey participants, researchers have restricted their analysis to a limited number of categories. "All subjects in a category are treated alike even though they may have originally been quite different on the continuous variable" (p. 577). Conversely, splitting respondents into equal groups assumes distinct differences exist between the groups. In the current study, a difference of .01 or smaller in mean scores may be all that distinguishes respondents from being placed in the low commitment group versus the medium commitment group. In either case, the author asserted the technique diminishes the "sensitivity of the analysis, not to mention the meaningfulness of the results" (Pedhazur, 1997, p. 577).

The sport commitment and club commitment variables were converted from continuous to categorical data by breaking respondents into three commitment groups (i.e., low, medium, high) based on their mean scores for each commitment variable. The above analysis explored statistically significant differences between the three groups. Researchers have also split respondents into three groups and focused on the differences between the low and high groups only, removing the middle group from further analysis. Doing so allows researchers to remove some of the arbitrariness potentially associated with classifying the middle group and focuses on respondents at the extreme ends of the spectrum (e.g., the difference between a respondent classified as low commitment versus medium commitment is less than .01). An opportunity exists to remove the "noise" found with the middle levels of commitment and focus on the extremes to draw more meaningful conclusions from the data results.

Product Involvement

Product involvement represents the interest or interaction an individual has with a particular good or service. Zaichkowsky (1985) created the Product Involvement Instrument (PII) to measure product involvement for a wide variety of consumer goods from red wine and breakfast cereals to washing machines and automobiles. To measure attitudinal product involvement, she asked respondents to rate the products using 20 semantic differential items such as "important/unimportant" and "appealing/unappealing." Responses were collected from survey participants on fourteen consumer products. The author found consistent results with each exploratory factor analysis. Two factors resulted, but the first one accounted for most of the variance in

product involvement, ranging from 65% for jeans to 100% for instant coffee. [No additional statistical details were provided.] For behavioral product involvement, respondents were asked to rate three consumer products: instant coffee, laundry detergent, and color televisions. Survey participants responded to five items, including "I would be interested in reading information about how this product is made," using a five-point response format. Zaichowsky reported favorable internal consistency reliability coefficients for each of the products with .97 for instant coffee, .97 for laundry detergent, and .99 for color televisions. The author concluded the attitudinal scale had adequate construct validity and the behavioral scale adequate internal consistency reliability. She welcomed future researchers to test both scales with other consumer products. Since the PII's introduction, researchers have not settled upon one consistent instrument. Instead, they continue to use the original instrument with modified items as well as new ones (e.g., Bauer et al., 2006; Havitz & Howard, 1995; McQuarrie & Munson, 1992; Michaelidou & Dibb, 2006; Traylor & Joseph, 1984; Zaichowsky, 1985; 1986).

The current study used items from two studies to assess product involvement. Attitudinal items derived from a twelve-item scale developed by Bauer et al. (2006). Their study examined an individual's attitudinal product involvement with consumer products hypothesized to have high involvement (stereo system, jeans, watch) and low involvement (toothpaste, chocolate bar, yogurt). The researchers gathered thirteen attitudinal product involvement items from Zaichowsky's (1985) study. They reworded the semantic differential items into statements. For example, the "irrelevant/relevant" item was changed to "It is not relevant to me." Survey participants were asked to use a five-point response format as they rated their levels of attitudinal product involvement to

the six consumer products listed above. The exploratory factor analysis of the items led to a three-factor solution of pleasure ("The product is fun"), importance ("It is not relevant to me"), and sign value ("It helps me express my personality"). Internal consistency reliability coefficients were computed for each factor. The pleasure items had an internal consistency reliability coefficient of .86, importance of .83, and pleasure of .86, which exceeded the .70 acceptable threshold (Nunnally, 1978). The three factors explained 67.4% of the variance in product involvement. The researchers conducted confirmatory factor analysis and reported acceptable results using Hu and Bentler's (1999) threshold of .90, where $X^2 = 415$, $df = 51$, $p < .05$, CFI = .90, GFI = .92, AGFI = .88. [RMSEA was not reported] (Bauer et al., 2006).

The four importance items were included in the current study as they best represented attitudinal product involvement and captured an individual's reaction to a new good or service. The items were 1) "This product is relevant to me," 2) "This product does not matter to me," 3) "This product is of no concern to me," and 4) "This product is important to me" (Bauer et al., 2006). A seven-point response format was used with the anchors *strongly disagree* (1) to *strongly agree* (7).

Behavioral product involvement items were taken from a study by McQuarrie and Munson (1992). The authors used five items from Zaichowsky's (1985) "I would be interested in reading about this product" and "I have compared product characteristics among brands." They also added items of their own such as "I usually pay attention to ads for this product" and "I usually spend a lot of time choosing what kind to buy." The researchers asked survey participants to answer with a five-point response format to the items as they considered nine consumer products, including breakfast cereal, color

televisions, instant coffee, and jeans. A factor analysis was conducted for each product and in aggregate. The authors reported a two-factor solution for the aggregated factor analysis and either a single-factor or two-factor solution for each product. [Additional details for each product and the aggregated analysis were not provided.] Measuring the internal consistency reliability of the ten behavioral product involvement items, the authors reported a Cronbach's alpha of .95, which surpassed the .70 threshold deemed acceptable by Nunnally (1978). Using multiple regression analysis, the researchers found the items generated an R^2 of .452 at the .05 alpha level, indicating 45% of the variance in product involvement was explained by the proposed items. [No further details regarding the F score or degrees of freedom were provided] (McQuarrie & Munson, 1992).

The applicability of the ten items for the current study was assessed. Six of the items focused on the brand aspect of the product with items such as "I have compared product characteristics among brands" and "I think there are a great deal of differences among brands." The current study was focused more specifically on a single product as opposed to competing brands within the product category. As such, four items were ruled appropriate for the study and were modified to quantify the behavioral component. They were 1) "I would be interested in reading about this product," 2) "I would read a cycling magazine's article about this product," 3) "I usually pay attention to ads for this product," and 4) "I usually talk about this product with other people" (McQuarrie & Munson, 1992). A seven-point response format was used with the anchors *strongly disagree* (1) to *strongly agree* (7).

A total of eight items, four attitudinal and four behavioral, were incorporated into the current study to capture product involvement as respondents considered new cycling goods and services.

Purchase Intentions

Purchase intentions often serves as a substitute for measuring actual sales. The variable can be operationalized by asking participants to project how much they will spend on a good or service in the future. Numerous sports-related studies have used the variable. McGehee et al. (2003) asked recreational runners about their future spending purchases with an open-ended item "Amount spent on running since May 1999: _____." Casper et al. (2007) studied the purchase intentions of recreational tennis players and used the item "Place a monetary value on the future purchase of \$_____ over a one-year period." Respondents were given a list of possible tennis expenditures, including rackets, stringing, balls, and shoes, and asked to project how much they would spend on each item during the next twelve months (Casper et al., 2007).

Other researchers have asked survey participants to respond to statements regarding purchase intentions using a five-point or seven-point response format. Kwon et al. (2007) assessed purchase intentions to determine how team identification affected licensed merchandise spending for fans with high versus low levels of identification. Respondents were shown a picture of a hypothetical athletic shirt and its price. To measure purchase intentions, the authors used three items: 1) "I would purchase the item," 2) "I would consider buying the item," and 3) "The probability that I would consider buying is high." Survey participants used a seven-point response format with the

anchors *strongly disagree* (1) to *strongly agree* (7). The researchers conducted confirmatory factor analysis and reported acceptable results based on the criteria of average-variance-extracted value (AVE) greater than .50. The AVE equaled .67, where $X^2 = 42.70$, $df = 24$, $p < .05$, RMSEA = .08. The purchase intentions items had an AVE of .84. The items also had an internal consistency reliability coefficient of .93, which exceeded the .70 threshold established by Nunnally (1978).

The current study used the same three items from the Kwon et al. (2007) research to measure club members' purchase intentions for the cycling good and service. Survey participants used a seven-point response format with the anchors *strongly disagree* (1) to *strongly agree* (7).

Product involvement and purchase intentions were measured as continuous variables using a seven-point response format anchored by *strongly disagree* (1) to *strongly agree* (7). Carifio and Perla (2007) noted some researchers have argued the response format generates ordinal-level data, which would dictate the use of non-parametric statistics, while other researchers have indicated the widespread use of parametric statistics with this data. Carifio and Perla sanctioned the usage, arguing the *F*-test is sufficiently robust to handle the data when scales with multiple items are used (Carifio & Perla, 2007). Tabachnick and Fidell (2001) agreed when the scale has continuous properties and the response format includes seven points or more. Similarly, Jaccard and Wan (1996) noted, "for many statistical tests, rather severe departures (from intervalness) do not seem to affect Type I and Type II errors dramatically" (Jaccard & Wan, 1996, p. 4).

Demographic Information

The survey contained a demographic question, asking survey participants to indicate whether they were female or male. The item was used to verify whether the sample reflected a similar demographic split as compared to the cycling club and cyclists in general. Researchers studying sport commitment and club commitment have also included questions to measure a respondent's tenure with the club and with the sport (e.g., Casper et al., 2007; Haggerty & Denomme, 1991; Scanlan et al., 1993). The current study incorporated similar items, asking respondents to indicate how long they had participated in cycling and how often they participated in club activities on a weekly basis.

Construct Validity

Prior to the survey's distribution, a group of reviewers comprised of sport administration professors and doctoral students was assembled to review the instrument and assess its construct validity. DeVellis (2003) defined a construct as an unobservable trait. Construct validity is "the extent to which a measure 'behaves' the way that the construct it purports to measure should behave" (DeVellis, 2002, p. 53). The presence of content validity indicates the survey instrument and items measures what they intend to measure.

The current study's instrument was assessed for content validity. The purpose of the assessment was to ensure the linkages were operationalized clearly so survey respondents could distinguish between relational, operational, and technological linkages when reading each scenario. Reviewers received a list of definitions for the three linkage types. They also received a list of three activities (e.g., "hanging with a group of friends")

and were asked to match the linkage type to the activity. Reviewers were asked to write their responses down, and the responses were discussed with reviewers. The reviewers provided feedback regarding the scenario linkages and the construct validity of each activity. Reviewer recommendations for improvement were incorporated into the survey scenarios.

Field Test

A revised instrument was distributed to undergraduate students taking a sport administration course. Students completed the survey for extra credit and provided comments regarding completion time, item readability, and overall coherence. Most respondents agreed the survey would take approximately five to ten minutes to complete. They indicated the scenarios and items were easy to read and responses would yield results applicable to the study's purpose.

Researchers using scenarios may use manipulation checks to confirm the manipulations produced the desired effects. Manipulations can come in the form of instructions such as "Write 'I read the instructions' somewhere on the page" (Oppenheimer, Meyvis, & Davidenko, 2009). They can also consist of statements requiring a five-point or seven-point response format like "The waiter apologized for the poor service" (Mattila & Cranage, 2005) or questions such as "How trustworthy are the sources of information posed here?" (Angst & Agarawal, 2009).

Manipulation Checks

Manipulation checks were included in the current study to ensure the two variables, innovation type and linkage type, were perceived as different by those answering questions about each scenario. Four manipulation checks were used:

1. In this scenario, the cycling innovation introduced was a new service.
2. In this scenario, the innovation was discussed among a group of friends.
3. In this scenario, the innovation was discussed during a presentation.
4. In this scenario, the innovation was discussed on a website.

Each manipulation was followed by a seven-point response format anchored with *strongly disagree* (1) to *strongly agree* (7). For the first question, it was expected that respondents completing a scenario with a new good would produce answers skewed towards *strongly disagree* while those with a new service would have answers skewed towards *strongly agree*. Responses for the second question would be skewed towards *strongly agree* for club members who learned about the innovation among a group of friends and towards *strongly disagree* for those who learned about the change during a presentation or on a website. Similarly, responses for the third question would be skewed towards *strongly agree* for club members who learned about the innovation during a presentation and towards *strongly disagree* for those who learned about the innovation while with a group of friends or on a website. Finally, responses for the fourth question would be skewed towards *strongly agree* for club members who learned about the innovation while on a website and towards *strongly disagree* for those who learned about the innovation among a group of friends or during a presentation. Manipulation checks from the field test led to modifications made to the linkage types. The final linkages used

were "hanging out with a group of friends" (relational), "attending a presentation" (operational), and "while online" (technological).

A series of one-way ANOVAs was used to assess the manipulation check results. The mean score for each manipulation check was computed. The first manipulation check was tested with innovation type (good or service) as the independent variable and manipulation check #1 as the dependent variable. A one-way ANOVA was used to determine if a statistically significant difference existed between good and service on manipulation check #1. (No post hoc tests would be required in the event of statistical significance as there were only two innovation groups.)

The second manipulation check was tested with linkage type (relational, operational, or technological) as the independent variable and manipulation check #2 as the dependent variable. A one-way ANOVA was used to determine if a statistically significant difference existed between linkage type on manipulation check #2. In the event of a statistically significant difference, a Tukey post hoc test was conducted to determine where statistical significance occurred. A statistically significant difference should exist between relational and operational means and between relational and technological means, if the manipulation succeeded.

The third manipulation check was tested with linkage type (relational, operational, or technological) as the independent variable and manipulation check #3 as the dependent variable. A one-way ANOVA was used to determine if a statistically significant difference existed between linkage type on manipulation check #3. In the event of a statistically significant difference, a Tukey post hoc test was conducted to determine where statistical significance occurred. Again, a statistically significant difference should

exist between operational and relational means and between operational and technological means, if the manipulation succeeded.

The fourth manipulation check was tested with linkage type (relational, operational, or technological) as the independent variable and manipulation check #4 as the dependent variable. A one-way ANOVA was used to determine if a statistically significant difference existed between linkage type on the manipulation check #4. In the event of a statistically significant difference, a Tukey post hoc test was conducted to determine where statistical significance occurred. A statistically significant difference should once again exist between technological and relational means and between technological and operational means, if the manipulation succeeded.

Data Collection Process

Surveys were distributed and collected through two outlets: 1) providing a paper copy of the survey to members at club rides and collecting completed surveys at the rides and 2) notifying members of an online version of the paper survey via the LBC website forum and KyCycList listserv and having them complete the survey at a computer with Internet access.

Paper Surveys. The club offers rides on an almost daily basis year-round and several times per day from May through September. Each scheduled ride appeals to a different cross-section of members based on the ride's length (ranging from 15 to 100+ miles) and difficulty level (#1 for family and beginner rides to #5 for rides containing steep hills and/or longer distances). Certain longstanding rides are known for catering to specific groups. For instance, one Saturday morning and a Sunday mid-day ride

accommodate families and newer riders whereas a certain Sunday afternoon ride provides a higher-paced outing for club racers and faster, more experienced riders. A Thursday morning ride offers a longer distance and lunch for club members who are retired or stay-at-home parents, while a Tuesday evening ride has a larger number of cyclists in their thirties and forties, who often congregate for post-ride drinks and dinner at a nearby restaurant.

Surveys were collected at rides during the month of October 2009. Club members typically congregate 30 minutes before and after each ride. Potential respondents were approached during these times and asked to complete the survey. Each survey contained one of the six scenarios, and each respondent received a randomly assigned survey. The surveys were collated in a stack of rotating scenarios (i.e., survey with scenario #1, survey with scenario #2, survey with scenario #3, survey with scenario #4, survey with scenario #5, survey with scenario #6, survey with scenario #1, survey with scenario #2, and so on). If a potential respondent agreed to complete the survey, he or she was given the next scenario in the stack. The scenarios were also color coded. Surveys #1 through #3 were printed on orange paper. Surveys #4 through #6 were printed on green paper. The color coding made the survey collection easier and helped to ensure a constant rotation of surveys across club members and club rides. For example, surveys were distributed for the first time at a Monday night ride. If nine riders agreed to complete the survey before the group ride, they would complete two surveys with scenario #1, two surveys with scenario #2, two surveys with scenario #3, one survey with scenario #4, one scenario with survey #5, and one scenario with survey #6 in total. At the next ride on Tuesday afternoon, the first club member who agreed to complete a survey would receive

a copy of scenario #4, the second member a copy of scenario #5, and so on to keep the six scenarios on a constant rotation across club members and club rides during the month. This rotation helped to ensure relatively equal numbers of each scenario type were distributed to club members.

Attached to each survey was a tear-off form where a respondent could write his or her name, e-mail address, and telephone number. Members completing the form were entered into a drawing for a \$100 gift certificate from the local bike shop of their choice. The forms were collected and stored separately from the surveys.

Online Surveys. Surveys were also collected online to counter challenges with distributing surveys at club rides. October 2009 had lower than average temperatures and more rain than previous Octobers. The October average high is 68 degrees Fahrenheit, and the average low is 49 degrees Fahrenheit. October 2009 saw unseasonably high (81 degrees Fahrenheit) and low temperatures (32 degrees Fahrenheit). The average October rainfall is 2.79 inches. The October 2009 rainfall was 6.30 inches for the month (Weather Channel, 2009). The club had 286 unique riders participate during the month versus 386 in September and a season high of 418 in August (LBC, 2009). The number of active riders attending on a monthly basis was significantly lower than the number of actual members in a club.

An online survey was used to reach riders who may have chosen not to ride in an unseasonably cold and wet conditions--or simply choose not to participate in club rides on a regular basis. Researchers are increasingly using online surveys in conjunction with or in lieu of traditional paper surveys. Websites like Survey Monkey and Formsite provide researchers with easy-to-use software to create surveys and analyze results

(Dillman, 2007). Researchers have questioned whether differences exist in administering surveys online versus using more traditional approaches. A number of studies have been conducted to determine if statistically significant differences exist in terms of a respondent's perception of the survey delivery method and their responses to survey items. For example, Cronk and West (2002) distributed paper and online surveys to college students completing end-of-semester teaching evaluations of their respective professors. The researchers used a 2 x 2 between-subjects factorial ANOVA to determine whether differences existed between the two distribution methods. The study found no statistically significant differences, where $F(1, 192) = .045, p = .832$ (Cronk & West, 2002). Other studies comparing the two formats have reported similar results and have noted the benefits of online surveys such as being more attractive, easier to administer and complete, and more environmentally friendly (Hancock & Flowers, 2001; Layne, DeCristoforo, & McGinty, 1999; Leung & Kember, 2005; Vispoel, Boo, & Bleiler, 2001).

Based on these findings, the current study also employed a combination of paper and online survey distributions. A series of one-way ANOVAs was conducted to determine whether statistically significant differences in sport commitment, club commitment, product involvement, and purchase intentions mean scores existed for respondents completing paper versus online surveys. A similar analysis was completed for early versus late responders.

The paper survey was replicated and posted online at survey host Formsite (www.formsite.com). Potential respondents were notified through the LBC website forum and KyCycList listserv about the online survey. A link to the survey was provided

in the website forum and listserv messages. Respondents were asked to click on the link, which would open the online survey. The first page provided the same preamble included on the front page of the paper survey. After reading the preamble, respondents were asked to indicate on what day their birthday fell in 2009 by checking a box for either Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, or Sunday. The respondent's day selection dictated which scenario he or she received. Scenario #1 corresponded with Monday, scenario #2 with Tuesday, scenario #3 with Wednesday, scenario #4 with Thursday, scenario #5 with Friday, and scenario #6 with both Saturday and Sunday. The online survey also randomized the listing of days for each respondent. One respondent may have seen the days listed as Sunday Thursday Wednesday Friday Saturday Tuesday Monday, while another respondent may have seen the days listed as Monday Tuesday Friday Sunday Thursday Saturday Wednesday. Randomization of the days was used because respondents may not have remembered their actual birthday day. Instead of looking it up on a calendar, they may have opted to simply choose one of the days at random, most likely the first day listed. To prevent respondents from all choosing the first day (i.e., Monday if it was listed first in a non-randomized list), the randomized days helped to ensure respondents received and completed a relatively equal mix of scenarios.

After receiving and reading the scenario, respondents were asked to answer the same survey questions from the paper survey. Those completing the entire survey were re-directed to a second online survey. This survey asked each respondent to write his or her name, e-mail address, and telephone number. Members completing the online form were also entered into the drawing for a \$100 gift certificate from the local bike shop of their choice. The forms were collected and stored separately from the surveys online.

The online tear-off form information was downloaded into Excel, and a paper copy of the information was made. This information was combined with data gathered from the tear-off forms from the paper survey. A winner was chosen from the combined online and paper submissions. The online survey data were downloaded into SPSS 17.0. The data were combined with data collected from the paper surveys for analysis.

Quantitative Data Analysis

To complete the analysis, descriptive statistics and correlations for the independent and dependent variables were examined. Cronbach's alphas were computed to measure the internal consistency reliability of each set of items for the variables sport commitment, club commitment, product involvement, and purchase intentions. Internal consistency reliability coefficients greater than or equal to .70 were deemed acceptable using the threshold established by Nunnally (1978).

Factor Analysis

A high correlation between attitudinal product involvement items and behavioral product involvement items was hypothesized. Previous studies have examined the two variables and their respective items separately. Two studies assessing the internal consistency reliability and construct validity of both variables conducted separate analyses for each variable (McQuarrie & Munson, 1992; Zaichkowsky, 1985). Treating attitudinal product involvement and behavioral product involvement as two distinct variables may have been a direct result of the item format used to measure each variable. Attitudinal product involvement was originally examined using semantic differential

items while behavioral product involvement was assessed using items phrased as statements. Bauer et al. (2006) modified the attitudinal product involvement semantic differential into statements and measured the variable via the modified statements. However, the researchers did not measure the variable in conjunction with behavioral product involvement. The current study combined Bauer et al.'s (2006) items for attitudinal product involvement and McQuarrie and Munson's (1992) items for behavioral product involvement.

An individual may express product involvement without actually purchasing a product. Product involvement may serve as a precursor to purchase intentions, yet the existence of product involvement does not automatically lead to purchasing a product. The marketing AIDA (awareness, interest, desire, action) framework suggests organizations like manufacturers and retailers go through a multi-step process to influence consumer purchasing decisions (Howard & Crompton, 2003). The first step is to create awareness so consumer knows the products exist. The next step is to generate interest by providing information about the products features and benefits. This information may create consumer desire, whereby the potential consumer expresses an interest in wanting to obtain the product. The final step is action, i.e., the consumer obtains the product. This process can be facilitated through corporate sponsorships and advertising (Howard & Crompton, 2003). A multi-step process may exist in the current study similar to the AIDA framework, whereby respondents express product involvement which may or may not translate into actual purchase intentions. Therefore, it becomes important to understand what, if any, differences exist between the variables from the respondent's perspective. This information may prove useful to researchers and

manufacturers trying to understand the relationship between the two variables, particularly for manufacturers who want to transform product involvement into purchase intentions and actual sales.

An exploratory factor analysis was conducted to test whether the items measured two distinct constructs--attitudinal product involvement and behavioral product involvement--or one single construct--product involvement. A more parsimonious one-factor solution would dictate the use of a two-group analysis of variance (ANOVA) for product involvement and purchase intentions rather than a three-group ANOVA for attitudinal product involvement, behavioral product involvement, and purchase intentions.

Analysis of Variance (ANOVA)

Three sets of two-way between-subjects factorial ANOVAs were proposed to address the study's four research questions.

- 1. What is the effect of linkage type (relational, operational, technological) on the dissemination of innovations (product involvement, purchase intentions)?*
- 2. What is the effect of innovation type (good, service) on the dissemination of innovations (product involvement, purchase intentions)?*

Two 3 (relational, operational, technological) x 2 (good or service) between-subjects factorial ANOVAs were used to assess the main effects of linkage type and innovation type and the interaction effect between linkage type and innovation type on product involvement and purchase intentions. Linkage type and innovation type were the independent variables and product involvement was the dependent variable in the first

two-way ANOVA. Linkage type and innovation type were the independent variables and purchase intentions was the dependent variable in the second two-way ANOVA.

3. What is the effect of sport commitment (low, medium, high) on the dissemination of innovations (product involvement, purchase intentions)?

Two 3 (relational, operational, technological) x 3 (low, medium, high sport commitment) between-subjects factorial ANOVAs were used to assess the main effect of sport commitment and the interaction effect between linkage type and sport commitment on product involvement and purchase intentions. Linkage type and sport commitment were the independent variables and product involvement was the dependent variable in the first two-way ANOVA. Linkage type and sport commitment were the independent variables and purchase intentions was the dependent variable in the second two-way ANOVA.

4. What is the effect of club commitment (low, medium, high) on the dissemination of innovations (product involvement, purchase intentions)?

Two 3 (relational, operational, technological) x 3 (low, medium, high club commitment) between-subjects factorial ANOVAs were used to assess the main effect of club commitment and the interaction effect between linkage type and club commitment on product involvement and purchase intentions. Linkage type and club commitment were the independent variables and product involvement was the dependent variable in the first two-way ANOVA. Linkage type and club commitment were the independent variables and purchase intentions was the dependent variable in the second two-way ANOVA.

CHAPTER IV

RESULTS

The current study examined the role of communication via linkages in the dissemination of innovations. The study measured three linkage types--relational, operational, and technological--and analyzed their effect on the innovation dissemination process. The study also combined linkage type with innovation type, sport commitment, and club commitment to determine whether the variables also had an effect on the dissemination of innovations, operationalized as product involvement and purchase intentions. A series of factorial ANOVAs were used to assess the main and interaction effects of the independent variables--linkage type, innovation type, sport commitment, and club commitment--on the dependent variables, product involvement and purchase intentions. The results of the study are detailed below.

Sample Size

During October 2009, a total of 195 surveys were collected for a response rate of 18%. Seventy surveys (36%) were paper surveys collected at club rides. The other 125 surveys or 64% were collected online. Thirty-three surveys were discarded because of either incomplete data (e.g., a respondent started but did not complete the survey) or unusable data (e.g., a respondent answered the items with all 7s or 1s). Of the 195 surveys, 162 were deemed usable for the study. Based on the club's population of 1,071

members, Dillman (2007) recommends a sample size of 275 respondents. Stevens (2002) suggests a similar 270 responses to achieve adequate statistical power when combining linkage type (relational, operational, or technological) with either innovation type (good or service), sport commitment (low, medium, or high) or club commitment (low, medium, or high). Statistical power indicates a test's ability to detect statistical significance when significance exists. Larger sample sizes are "intrinsically linked" with statistical significance and power (Field, 2005, p. 33). Conversely, smaller sample sizes restrict the ability to find small statistically significant differences in the data. Despite using two survey distribution techniques to maximize the sample size, only 162 usable responses were received, approximately 60% of the sample size recommended. However, Stevens (2002) suggests 15 subjects per independent variable. The current study had four independent variables, equating to a minimum of 60 respondents required. The sample of 162 surpasses this minimum threshold; however, the study's smaller than recommended sample size likely contributed to the limited number of statistically significant findings discussed later in the chapter.

Respondents

Respondents had an average of 5.98 years of sport participation ($SD = 6.46$). Seven respondents had 20 or more years of riding experience. Respondents participated in an average of 2.59 club rides per week ($SD = 2.183$). Seven riders participated in at least seven rides per week. Additional analyses were completed to determine whether differences existed between female versus male responders, early versus late responders, and data collected via paper versus online surveys.

Female Versus Male Responders. Forty respondents were female (25%), 120 were male (74%), and two did not respond (1%). The demographic split differed from the current LBC membership, which reported a more even split between females and males (LBC, 2008). The finding also contrasted with a demographic report of US cyclists, which reported a relatively even split between females (45%) and males (55%) at the national level (LocalCycling, 2006). Respondents in the current study completed the survey at a rate of one female for every three males. The ratio was not representative of the population. An analysis was completed to determine whether the data were skewed based on gender and whether gender should serve as a control variable in subsequent analyses. A series of one-way ANOVAs were examined to determine whether statistically significant differences existed between the mean scores of females versus males. The results showed no statistically significant differences in levels of sport commitment between females and males, where $F(1, 158) = .194, p = .660$. Additionally, females did not have statistically significant different levels of club commitment versus males, where $F(1, 158) = 2.415, p = .122$. No statistically significant differences in levels of product involvement existed between females and males, where $F(1, 158) = 1.143, p = .287$. Similarly, no statistically significant different levels of purchase intentions existed between females and males, where $F(1, 158) = 2.587, p = .110$. No differences were identified based on gender; therefore, controlling for gender was not required.

Early Versus Late Responders. Surveys were collected during October 2009. Of the 1,071 members, only 192 completed the survey. The low response rate merited further examination to determine whether differences in responses existed between responders and non-responders. Previous studies have indicated late responders are more

similar to non-responders (Siebert, 2006; Trinkoff & Storr, 1997). Therefore, to compare responders to non-responders, the study explored potential differences between early and late responders. A series of one-way ANOVAs were computed to determine whether statistically significant differences existed in the mean scores between the two groups. The majority of surveys were collected on or before October 14 (139, 86%). The remaining surveys were collected after October 14 (23, 14%). The results showed early responders did not have statistically significant different levels of sport commitment versus late responders, where $F(1, 160) = 1.271, p = .261$. Early responders did have statistically different levels of club commitment as compared to late responders, where $F(1, 160) = 6.585, p = .011$. Early responders had higher levels of club commitment ($M = 5.745, SD = 1.078$) versus late responders ($M = 5.094, SD = 1.389$). Early responders did not have statistically different levels of product involvement versus late responders, where $F(1, 159) = .226, p = .635$. Similarly, no statistically significant differences existed with purchase intentions for early versus late responders, where $F(1, 160) = .001, p = .976$. Club commitment was the only variable where early and late responders differed in their responses. This finding was expected and can be explained based on the data collection process. Data were collected through paper surveys distributed at club rides and online. All of the paper surveys were collected on or before October 14. Respondents attending these club rides were more likely to have higher levels of club commitment, demonstrated by their participation in club activities. The higher levels of club commitment in the current sample were expected. However, caution should be used when generalizing the results to the larger population.

Paper Versus Online Surveys. The study employed two data collection methods, paper surveys and online surveys. Of the 162 surveys deemed usable, 65 were completed via paper surveys at club rides (40%). The other 97 were completed online (60%). Previous studies have reported benefits with using online surveys, including the ability to reach a wider variety of respondents more effectively. The studies compared data collected from paper versus online surveys found no statistically significant differences between the two (Hancock & Flowers, 2001; Leung & Kember, 2005). Since two methods were used in the current study, a series of one-way ANOVAs were computed to determine whether statistically significant differences existed in the mean scores for respondents completing paper versus online surveys. An analysis was completed to determine whether the data were skewed based on survey distribution method and whether the variable should be used as a control variable. No statistically significant differences were found in sport commitment between the two survey types, where $F(1, 160) = 3.290, p = .072$. However, respondents completing the paper survey had statistically different levels of club commitment versus those completing the survey online, where $F(1, 160) = 8.565, p = .004$. Respondents completing the paper survey had higher levels of club commitment ($M = 5.97, SD = 1.18$) compared to those completing the survey online ($M = 5.44, SD = 1.077$). No statistically differences existed in product involvement between the two survey types, where $F(1, 159) = .488, p = .486$. Finally, no statistically significant differences existed for purchase intentions for respondents completing paper versus online surveys, where $F(1, 160) = .624, p = .431$. Like with early versus late responders, club commitment was the only variable where a statistically significant difference occurred. This result was also expected. All of the paper surveys

were distributed at the beginning of the month to respondents attending club rides. These individuals would likely have higher club commitment as evidenced by their attendance at club events. Again, while the finding was expected, caution should be used when generalizing the results to the larger population.

Survey Instrument

Several scales were used from previous studies to collect data regarding sport commitment, club commitment, product involvement, and purchase intentions. Prior to using the data collected, three tests were conducted: (a) internal consistency reliability, (b) factor analysis, and (c) manipulation checks.

Internal Consistency Reliability Analysis. The internal consistency reliability of the survey items was assessed. This analysis determines whether the survey items work together to measure the same underlying construct. For attitudinal product involvement, an internal consistency reliability coefficient of .914 was reported. The Cronbach's alpha exceeded the recommended .70 threshold deemed acceptable by Nunnally (1978). An internal consistency reliability coefficient of .929 was reported for the behavioral product involvement items, which also exceeded the recommended .70 threshold. The internal consistency reliability coefficient for purchase intentions was .954, which again exceeded the recommended .70 threshold.

The computed internal consistency reliability coefficient for the combined attitudinal product involvement, behavioral product involvement, and purchase intentions items was .961. Excluding the purchase intentions items, the computed internal consistency reliability coefficient for the combined attitudinal product involvement and

behavioral product involvement items was .948. Internal consistency reliability coefficients were also computed for sport commitment and club commitment. Sport commitment had an internal consistency reliability coefficient of .867, which exceeded the .70 threshold. Club commitment had an internal consistency reliability coefficient of .928. The reported internal consistency reliability coefficients for the scale items exceeded the .70 threshold and were retained for analysis.

Factor Analysis. Next, a factor analysis was completed to determine whether a more parsimonious solution existed among the dependent variables--attitudinal product involvement, behavioral product involvement, and purchase intentions. For factor analysis, some correlations between the variables under examination is desired. However, correlation can be too high, particularly when the absolute value of the Pearson correlation coefficient is greater than .80 (Stevens, 2002) or between .80 and .90 (Field, 2005). When high correlation exists, a principal components factor analysis may be conducted to reduce the number of variables used for analyses (Stevens, 2002).

In the current study, high correlation existed between the dependent variables (Table 1). Attitudinal product involvement and behavioral product involvement had a statistically significant and positive correlation with $r = .819$ ($p < .001$), indicating 67% of the common variance was shared between the two variables. Attitudinal product involvement reflects an individual's mental or emotional response to a product, and behavioral product involvement represents an individual's physical response to a product (Bauer et al., 2006; McQuarrie & Munson, 1992). Most studies tend to examine the variables separately. Zaichkowsky (1986) and Bauer et al. (2006) assessed attitudinal product involvement; McQuarrie and Munson (1992) generated items to study behavioral

product involvement. The latter researchers developed their items from the Zaichkowsky research. In the current study, the correlation between the two variables fell into the range deemed high by Field (2005) and Stevens (2002). A strong and positive correlation between attitudinal product involvement and behavioral product involvement was not surprising. Consumers who indicate an interest in a product will likely take steps to learn more about the product from friends and family members and through additional research (Bauer et al., 2006; McQuarrie & Munson, 1992; Zaichkowsky, 1986). A factor analysis was conducted to determine whether the dependent variables could be combined.

An exploratory factor analysis was completed using the principal component analysis. Bartlett's test of sphericity was used prior to conducting a factor analysis to test for correlations within the population. A statistically significant result indicates adequate correlations are present within the population and the factor analysis can be completed (Field, 2005). Bartlett's test of sphericity was used to test for correlations in the population. A p value equal to .000 was reported ($X^2 = 1254.898$, $df = 28$, $p < .001$). The values revealed statistically significant correlations existed in the population and the factor analysis could be conducted (Worthington & Whittaker, 2006). The Kaiser-Meyer-Olkin value equaled .904, which exceeded the .40 lower bound of acceptability and the .90 threshold classified as "excellent" (Kaiser, 1970, p. 405).

Table 1.

Correlation Matrix

Variable	1	2	3	4	5	6
Attitudinal Product Involvement	1.000					
Behavioral Product Involvement	.819**	1.000				
Product Involvement	.955**	.953**	1.000			
Purchase Intentions	.853**	.737**	.834**	1.000		
Sport Commitment	.200*	.291**	.257**	.222**	1.000	
Club Commitment	.233**	.251**	.253**	.197*	.415**	1.000

* $p < .05$

** $p < .01$

Attitudinal product involvement communalities ranged from a low of .616 to a high of .790. Behavioral product involvement communalities ranged from .690 to .796. All of the items had high communalities with high levels of shared common variance. The communalities indicated a strong relationship between the items and the underlying dimensions. A single initial component was reported with an eigenvalue of 5.913. The component explained 73.908% of the variance. Using the $EV > 1$ test, one factor was retained, and it explained a total of 73.908% of the variance in the initial solution. The first factor not retained had an eigenvalue of .626 and accounted for 7.823% of the variance. The scree test offered the same one-factor solution. Again, rotation of the data

was not completed as the single-factor solution eliminated the need for rotation and further analysis.

Based on this analysis, the attitudinal product involvement items were combined with the behavioral product involvement items to create a single product involvement variable. Previous studies analyzing product involvement have separately examined either attitudinal product involvement (Bauer et al., 2006; Zaichkowsky, 1985) or behavioral product involvement (McQuarrie & Munson, 1992). Attitudinal product involvement is often measured using semantic differential items, while behavioral product involvement is more likely measured using items as statements. Yet the distinction between the two variables may be a superficial one--based primarily on the format of the items themselves versus tangible differences between the two product involvement variables.

In the current study, attitudinal product involvement and behavioral product involvement were deemed highly correlated based on the thresholds established by Stevens (2002) and Field (2005). The internal consistency reliability of the combined items equaled .949. A factor analysis using the four attitudinal product involvement items and four behavioral product involvement items suggested a single factor solution. Similarly, a single-factor solution resulted when combining the four attitudinal product involvement items, four behavioral product involvement items, and the three purchase intentions items. A strong correlation existed between the combined product involvement items and the purchase intentions items ($r = .834, p < .001$). Seventy percent of the common variance was shared between the two variables. However, rather than using a single dependent variable with the combined eleven items, product involvement and

purchase intentions were analyzed as two separate dependent variables. An individual may become more involved with a product without actually purchasing it. Product involvement may serve as a precursor to purchase intentions, yet the existence of product involvement does not automatically lead to purchasing a product. Therefore, the two variables were examined separately in the current study to determine whether linkage type, innovation type, sport commitment, and club commitment influenced the variables differently.

Manipulation Checks. Along with the internal consistency reliability analysis and factor analysis, the results of the manipulation checks were analyzed. Each survey included one of six different scenarios, whereby one linkage type (relational, operational, or technological) with one innovation type (good or service) to create each scenario. The manipulation checks were incorporated into the survey instrument to ensure respondents read and understood the scenarios and responded to the independent variables, innovation type and linkage type, specifically discussed in each scenario.

The first manipulation check tested the innovation type. The item used was "In this scenario, the cycling innovation introduced was a new service." The means and standard deviations for the two innovation types, good and service, were computed. Good had a mean of 4.25 ($SD = 1.553$), and service had a mean of 5.03 ($SD = 1.515$). A one-way ANOVA revealed a statistically significant difference between the two groups on the dependent variable, manipulation check #1, where $F(1, 156) = 10.007, p = .002$. This result indicates respondents distinguished between a good and a service when responding to their respective scenarios.

The remaining manipulation checks tested linkage type. The item "In this scenario, the innovation was discussed among a group of friends" was used to test the relational linkage. The means and standard deviations for the three linkage types--relational, operational, and technological--were computed. Relational linkage had a mean of 5.29 ($SD = 1.590$), operational linkage had a mean of 4.03 ($SD = 1.681$), and technological linkage had a mean of 3.96 ($SD = 1.715$). Using a one-way ANOVA, a statistically significant difference was found between the three groups on the dependent variable, manipulation check #2, where $F(2, 155) = 9.637, p < .001$. The Tukey post hoc test revealed a statistically significant difference between the relational linkage and the operational linkage and between the relational linkage and the technological linkage at the .05 alpha level. The results revealed respondents properly distinguished the relational linkage from the other linkage types when completing the survey.

The next item was "In this scenario, the innovation was discussed during a presentation" to test the manipulation of the operational linkage. Relational linkage had a mean of 2.82 ($SD = 1.655$), operational linkage had a mean of 4.86 ($SD = 1.707$), and technological linkage had a mean of 3.57 ($SD = 1.611$). The one-way ANOVA results showed a statistically significant difference existed between the groups on the dependent variable, manipulation check #3, where $F(2, 154) = 20.407, p < .001$. The Tukey post hoc test revealed a statistically significant difference between the operational linkage and the relational linkage and between the operational linkage and the technological linkage at the .05 alpha level. Respondents correctly distinguished between the operational linkage and the other types when completing the survey.

The final item used was "In this scenario, the innovation was discussed on a website." The item was used to test the manipulation of the technological linkage. Relational linkage had a mean of 3.29 ($SD = 1.914$), operational linkage had a mean of 3.14 ($SD = 1.804$), and technological linkage had a mean of 5.30 ($SD = 1.422$). Again, the one-way ANOVA indicated a statistically significant difference existed between the groups, where $F(2, 154) = 26.283, p < .001$. The Tukey post hoc test revealed a statistically significant difference between the technological linkage and the relational linkage and between the technological linkage and the operational linkage at the .05 alpha level. The results showed respondents properly distinguished the technological linkage from the other linkage types when completing the survey.

Procedures

Six different scenarios were presented to respondents. The scenarios reflected a combination of one innovation type with one linkage type to create six distinct combinations. An attempt was made to obtain equal cell sizes. At club rides, the paper surveys were collated in a stack of rotating scenarios. For the online surveys, the respondent's birthday day selection dictated the scenario received. The online survey site randomized the listing of days for each respondent to help ensure an equal number of each scenario was completed. However, after reviewing the surveys received and retaining those with usable data, the collected data revealed the scenario cell sizes were not exactly equal. Of the 162 surveys collected, 85 contained a scenario with a good (52%) and 77 contained a scenario with a service (43%). The breakdown between the scenarios by innovation type and linkage type are below (Table 2). Stevens (2002)

suggests cell sizes are relatively equal as long as the largest cell divided by the smallest cell is less than 1.5. For linkage type, the largest cell was 60 (operational) and the smallest was 48 (relational) for a ratio of 1.25. The largest scenario cell was 31 (good x operational) and the smallest was 22 (service x relational) for a ratio of 1.41. In both cases, the ratio was less than 1.5, indicating the cell sizes were relatively equal (Stevens, 2002).

Table 2.

<i>Survey Scenario Frequencies</i>			
Linkage Type	Innovation Type	N	% of Total
Relational	Good	26	16%
	Service	22	14%
	Total	48	30%
Operational	Good	31	19%
	Service	29	18%
	Total	60	37%
Technological	Good	28	17%
	Service	26	16%
	Total	54	33%
Total	Good	85	52%
	Service	77	48%
	Total	162	100%

Descriptive Statistics

Sport Commitment. Respondents completed items regarding their sport commitment, and a mean sport commitment score could range from 1 for low sport commitment to 7 for high sport commitment. Data were collected from cycling club

members who may be more committed to the sport. To examine whether responses were normally distributed, skewness and kurtosis were calculated on conjunction with mean and standard deviation. The actual scores ranged from 1.00 to 7.00, and the overall mean for sport commitment was 5.97 ($SD = 1.036$). According to Field (2005), "the values of skewness and kurtosis should be zero in a normal distribution" (p. 72). The sport commitment skewness was -1.565 (standard error = .191), and the kurtosis was 3.470 (standard error = .379). Sport commitment was skewed negatively as the majority of respondents had higher commitment scores. The finding was expected as the study assessed interest in cycling innovations and data were collected from club members who either heard about the survey during a club ride or via the club's listserv or website. Individuals highly committed to the sport would be most likely to participate in club rides or keep up with the sport and participants through a cycling club's listserv or website. Committed members would also be more likely to complete a survey if they felt it would help the sport or another cyclist. Respondents were given the opportunity to write additional comments after completing the survey. Several respondents professed their love for cycling and desire to continue participation in the sport.

Sport commitment was measured initially as a continuous variable but was converted into a categorical data for the analysis of variance. Respondents were split into three groups based on their average sport commitment scores for the four items. Those with a mean sport commitment score less than 5.75 were placed in the low sport commitment category. Respondents with a mean sport commitment score greater than or equal to 5.75 but less than 6.75 were placed in the medium sport commitment category.

Respondents with a mean commitment score equal to or greater than 6.75 were placed in the high sport commitment category.

Club Commitment. Respondents also completed items regarding their club commitment. The mean club commitment scores could range from 1 for low club commitment to 7 for high club commitment. Data were collected from cycling club members who may be more committed to the club as well as to the sport. Mean, skewness, and kurtosis were examined to determine whether club commitment responses were normally distributed. The actual scores ranged from 1.00 to 7.00, and the overall mean for club commitment was 5.65 ($SD = 1.145$). The reported skewness was -1.218 (standard error = .191), and the kurtosis was 1.774 (standard error = .379). Club commitment was skewed negatively as the majority of respondents had higher commitment scores. This finding was also expected as the study collected data specifically from cycling club members who received the survey before a club ride or heard about the survey through the club's website or listserv. Again committed club members would be more likely to participate in club rides, keep up with club activities via the club's website or listserv, and help another club member and the club by completing the survey. Club members who answered the open-ended question remarked about the benefits club membership provided and their happiness with being club members.

Like sport commitment, club commitment was measured initially as a continuous variable but was converted into categorical data for the analysis of variance. Respondents were split into groups based on their average club commitment score for the six club commitment items. Those with a mean club commitment score less than 5.33 were placed

in the low club commitment category. Respondents with a mean club commitment score equal to or greater than 5.33 but less than 6.33 were placed in the medium club commitment category. Respondents with a mean commitment score equal to or greater than 6.33 were placed in the high club commitment category.

Product Involvement. Respondents completed eight items to assess their product involvement. Mean product involvement scores could range from 1 for low product involvement to 7 for high product involvement. The overall mean for product involvement was 4.57 ($SD = 1.447$). The product involvement mean for a good was 4.75 ($SD = 1.549$), and the product involvement mean for a service was 4.37 ($SD = 1.306$). The means for product involvement items ranged from 4.25 ($SD = 1.577$) for "This innovation is important to me" to 5.15 ($SD = 1.601$) for "I would read a cycling magazine's article about this innovation."

Purchase Intentions. Finally, respondents answered three items regarding their purchase intentions. Their purchase intentions mean scores could range from 1 for low purchase intentions to 7 for high purchase intentions. The overall mean for purchase intentions was 3.87 ($SD = 1.654$). The purchase intentions mean for a good was 4.18 ($SD = 1.721$). The purchase intentions mean for a service was 3.53 ($SD = 1.515$). The means for the purchase intentions items ranged from 3.71 ($SD = 1.810$) for "The probability that I would consider buying is high" to 4.18 ($SD = 1.797$) for "I would consider buying the innovation."

ANOVA Assumptions

Before a factorial ANOVA can be conducted, three assumptions must be met: independence, normality, and homogeneity of variance. Independence states "the score for any particular subject is independent of the scores of all other subjects" (Shavelson, 1996, p. 378). Participant scores were not influenced before or during the testing process. The study's design addressed independence by assuring respondents completed the survey independently of one another and were not influenced by other respondents. Meeting the normality assumption indicates "the scores within each treatment population are normally distributed" (Shavelson, 1996, p. 378). Normality was tested by analyzing a histogram of the scores. Graphed frequencies forming a bell curve would provide evidence of normality. The final assumption, homogeneity of variance, suggests "the scores within each treatment population are normally distributed" (Shavelson, 1996, p. 378). Results from the Levene's test were used to evaluate whether the data met the assumption. The test hypothesis states no statistically significant difference exists between groups within the population. Levene's test results indicating no significance would indicate the data meet the assumption and ANOVAs can be used.

Analysis of Variance

Three sets of two-way between-subjects factorial ANOVAs were used to answer the four research questions.

1. What is the effect of linkage type (relational, operational, technological) on the dissemination of innovations (product involvement, purchase intentions)?

2. What is the effect of innovation type (good, service) on the dissemination of innovations (product involvement, purchase intentions)?

Two two-way between-subjects factorial ANOVAs were used to assess the main and interaction effects of linkage type (relational, operational, or technological) and innovation type (good or service) on product involvement and purchase intentions. For the first 3x2 ANOVA, linkage type and innovation type were the independent variables, and product involvement was the dependent variable. The three ANOVA assumptions were met. Respondent scores were obtained independently of one another. A histogram of the product involvement scores revealed the data formed a relatively normal bell curve. Homogeneity of variance was assessed using a Levene's test. The data did not meet the assumption, where $F(5, 156) = 2.484, p = .034$. However, ANOVAs are fairly robust. Shavelson (1996) noted "when cell sizes are equal, the ANOVA is [] not sensitive to violations of the assumption of homogeneity of variance" (Shavelson, 1996, p. 424). As discussed above, the cell sizes were relatively equal according to the calculations suggested by Stevens (2002). Therefore, the analysis was completed using the data.

The ANOVA results for product involvement revealed no statistically significant interaction existed between linkage type and innovation type, where $F(2, 156) = 2.178, p = .117$ (Table 3). Respondents expressed similar levels of interest in both the good and the service when they heard about the innovation from a friend, during a presentation, or on a website.

There was no statistically significant main effect of linkage type on product involvement, where $F(2, 156) = 1.142, p = .322$. How respondents learned about the innovations did not influence their interest in learning more about or purchasing the

products. There was also no statistically significant main effect of innovation type on product involvement, where $F(1, 156) = 3.079, p = .081$. Whether the innovation was a good or a service did not influence a respondent's interest in learning more about it.

In the second 3x2 ANOVA, linkage type and innovation type were the independent variables, and purchase intentions was the dependent variable. The three ANOVA assumptions were met. Respondent scores were obtained independently of one another. A histogram of the purchase intentions scores revealed the data formed a relatively normal bell curve. Homogeneity of variance was assessed using a Levene's test. The data met the assumption, where $F(5, 156) = 1.114, p = .355$.

The ANOVA results for purchase intentions revealed no statistically significant interaction existed between linkage type and innovation type, where $F(2, 156) = .961, p = .385$ (Table 4). Again, respondents expressed similar levels of interest purchasing both the good and the service when they heard about the innovations from a friend, during a presentation, or on a website. There was no statistically significant main effect of linkage type on purchase intentions, where $F(2, 156) = 2.361, p = .098$. How respondents learned about the innovations did not influence their decision to purchase them. However, there was a statistically significant main effect of innovation type on purchase intentions, where $F(1, 156) = 7.032, p = .009, \eta^2 = .043$. The type of innovation did have an effect on a respondent's desire to purchase an innovation. Respondents expressed greater interest in purchasing the good ($M = 4.18, SD = 1.721$) versus the service ($M = 3.53, SD = 1.515$) (Table 5). Eta-squared provides a "measure of the strength of association" (Shavelson, 1996, p. 387) between the dependent and independent variables. According to Cohen (1988, 1992), an effect size less than .30 is characterized as a small effect (as cited in

Field, 2005). The innovation type main effect's η^2 was .043. Four percent of the variance in purchase intentions was accounted for by innovation type. A small relationship exists between purchase intentions and innovation type.

Table 3.

Factorial ANOVA: Linkage Type and Innovation on Product Involvement

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>	η^2
Linkage	4.644	2	2.322	1.142	0.322	0.014
Innovation	6.262	1	6.262	3.079	0.081	0.019
Linkage x Innovation	8.858	2	4.429	2.178	0.117	0.027
Error	317.279	156	2.034			
Total	336.998	161				

Table 4.

Factorial ANOVA: Linkage Type and Innovation on Purchase Intentions

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>	η^2
Linkage	12.272	2	6.136	2.361	0.098	0.029
Innovation	18.279	1	18.279	7.032	0.009	0.043
Linkage x Innovation	4.993	2	2.497	0.961	0.385	0.012
Error	405.490	156	2.599			
Total	440.448	162				

Table 5.

Standard Deviations and Means for Linkage Type and Innovation Type

Innovation Type	Linkage Type	Product Involvement		Purchase Intentions	
		Mean	Standard Deviation	Mean	Standard Deviation
Good	Relational	4.87	1.62	4.28	1.82
	Operational	4.26	1.64	3.65	1.70
	Technological	5.18	1.25	4.69	1.53
	Total	4.75	1.55	4.18	1.72
Service	Relational	4.47	1.35	3.42	1.57
	Operational	4.42	1.06	3.45	1.25
	Technological	4.23	1.54	3.72	1.76
	Total	4.37	1.31	3.53	1.52
Total	Relational	4.69	1.50	3.89	1.75
	Operational	4.34	1.38	3.55	1.49
	Technological	4.72	1.47	4.22	1.70
	Total	4.57	1.45	3.87	1.65

3. What is the effect of sport commitment (low, medium, high) on the dissemination of innovations (product involvement, purchase intentions)?

Two two-way between-subjects factorial ANOVAs were used to assess the effect of linkage type (relational, operational, or technological) and sport commitment level (low, medium, or high) on product involvement and purchase intentions. The first 3x3 ANOVA used linkage type and sport commitment as the independent variables, and product involvement was the dependent variable. The three ANOVA assumptions were met.

Respondent scores were obtained independently of one another. A histogram of the product involvement scores revealed the data formed a relatively normal bell curve. Homogeneity of variance was assessed using a Levene's test. The data met the assumption, where $F(8, 153) = 1.100, p = .366$.

The ANOVA results for product involvement revealed no statistically significant interaction existed between linkage type and sport commitment, where $F(4, 153) = 1.332, p = .261$ (Table 6). Respondents highly committed to the sport and respondents less committed to the sport had similar levels of product involvement when they heard about innovations through the three linkages. There was no statistically significant main effect of linkage type on product involvement, where $F(2, 153) = 2.240, p = .332$. Again, how respondents learned about the innovations did not influence their decisions to learn more about them. There was a statistically significant main effect of sport commitment on product involvement, where $F(2, 153) = 3.093, p = .048, \eta^2 = .039$. Respondents with higher levels of sport commitment had greater interest in learning about the innovations versus respondents with lower levels of sport commitment. The Tukey post hoc test revealed respondents with high sport commitment ($M = 4.88, SD = 1.541$) had statistically significant different levels of product involvement versus respondents with low sport commitment ($M = 4.21, SD = 1.422$). The sport commitment main effect's η^2 was .039. Four percent of the variance in product involvement was accounted for by sport commitment. A small relationship exists between product involvement and sport commitment.

In the second 3x3 ANOVA, linkage type and sport commitment were the independent variables, and purchase intentions was the dependent variable. The three

ANOVA assumptions were met. Respondent scores were obtained independently of one another. A histogram of the purchase intentions scores revealed the data formed a relatively normal bell curve. Homogeneity of variance was assessed using a Levene's test. The data met the assumption, where $F(8, 153) = 1.009, p = .432$.

The ANOVA results for purchase intentions revealed a statistically significant and disordinal interaction between linkage type and sport commitment, where $F(4, 153) = 3.111, p = .017, \eta^2 = .075$ (Table 7). The effects of sport commitment on purchase intentions were not the same across the three linkage types. Respondents with higher commitment to the sport had statistically different levels of purchase intentions versus respondents with less sport commitment when they heard about innovations through the three linkages (Figure 1). Individuals with high sport commitment indicated their highest levels of purchase intentions when they heard about the innovation through either the technological ($M = 4.94, SD = 1.48$) or relational linkage ($M = 4.65, SD = 1.83$). They had their lowest levels of purchase intentions ($M = 3.30, SD = 1.76$) when they heard about the innovation through the operational linkage. Conversely, individuals with low sport commitment had their lowest levels of purchase intentions when they heard about the innovation through technological ($M = 3.15, SD = 1.66$) and relational linkages ($M = 3.17, SD = 1.55$) and their highest levels of purchase intentions when they heard about the innovation through the operational linkage ($M = 3.87, SD = 1.12$). The linkage type x sport commitment interaction's η^2 was .075. Eight percent of the variance in purchase intentions was accounted for by the interaction between linkage type and sport commitment.

Figure 1.

Linkage Type and Sport Commitment Interaction on Purchase Intentions

When a statistically significant interaction exists, simple effects analysis can be used to determine from where the statistical significance derives. These results can then be used to determine specifically which means contributed to the statistical significance (Field, 2005). In the current study, the simple effects analysis indicated a statistically significant difference between the three sport commitment levels for the relational linkage, where $F(2,153) = 3.73, p = .026$. A statistically significant difference was also found between the sport commitment levels for the technological linkage, where $F(2,153) = 6.08, p = .003$. No statistically significant difference was found between the sport commitment levels for the operational linkage, where $F(2,153) = 1.99, p = .449$. For the relational linkage, the simple comparisons tests revealed statistically significant

differences between respondents with low sport commitment and high sport commitment, where $F(1,153) = 4.17, p = .043$. For the technological linkage, statistically significant differences existed between respondents with low sport commitment and high sport commitment, where $F(1,153) = 11.02, p = .001$, and between low sport commitment and medium sport commitment, where $F(1,153) = 7.26, p = .008$.

When disordinal interaction exists, the main effects of the ANOVA are typically not analyzed further. However, examining the main effects revealed the following results. There was no statistically significant main effect of linkage type on purchase intentions, where $F(2, 153) = 2.053, p = .132$. How respondents learned about the innovations did not influence their interest in purchasing the products. There was a statistically significant main effect of sport commitment on purchase intentions, where $F(2, 153) = 4.107, p = .018, \eta^2 = .051$. The Tukey post hoc test revealed respondents with high sport commitment ($M = 4.23, SD = 1.829$) expressed more interest in purchasing the innovations versus respondents with low sport commitment ($M = 3.39, SD = 1.472$) at the .05 alpha level (Table 8). The sport commitment main effect's η^2 was .051. Five percent of the variance in purchase intentions was accounted for by sport commitment. A small relationship exists between purchase intentions and sport commitment.

Table 6.

Factorial ANOVA: Linkage Type and Sport Commitment on Product Involvement

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>	η^2
Linkage	4.481	2	2.240	1.109	0.332	0.014
Sport Commit	12.495	2	6.247	3.093	0.048	0.039
Linkage x Sport Commit	10.761	4	2.690	1.332	0.261	0.034
Error	309.039	153	2.020			
Total	336.998	161				

Table 7.

Factorial ANOVA: Linkage Type and Sport Commitment on Purchase Intentions

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>	η^2
Linkage	10.137	2	5.069	2.053	0.132	0.026
Sport Commit	20.282	2	10.141	4.107	0.018	0.051
Linkage x Sport Commit	30.731	4	7.683	3.111	0.017	0.075
Error	377.797	153	2.469			
Total	440.448	161				

Table 8.

Standard Deviations and Means for Linkage Type and Sport Commitment

Sport Commitment	Linkage Type	Product Involvement		Purchase Intentions	
		Mean	Standard Deviation	Mean	Standard Deviation
Low	Relational	4.41	1.35	3.17	1.55
	Operational	4.29	1.31	3.87	1.12
	Technological	3.95	1.63	3.15	1.66
	Total	4.21	1.42	3.39	1.47
Medium	Relational	4.37	1.33	3.67	1.57
	Operational	4.40	1.20	3.57	1.45
	Technological	4.87	1.46	4.46	1.55
	Total	4.55	1.33	3.90	1.55
High	Relational	5.19	1.69	4.65	1.83
	Operational	4.30	1.66	3.30	1.76
	Technological	5.28	1.00	4.94	1.48
	Total	4.88	1.54	4.23	1.83
Total	Relational	4.69	1.50	3.89	1.75
	Operational	4.34	1.38	3.55	1.49
	Technological	4.72	1.47	4.22	1.70
	Total	4.57	1.45	3.87	1.65

4. What is the effect of club commitment (low, medium, high) on the dissemination of innovations (product involvement, purchase intentions)?

Two two-way between-subjects factorial ANOVAs were used to assess the main effect of club commitment level (low, medium, or high) on product involvement and purchase intentions. For the first 3x3 ANOVA, linkage type and club commitment were the independent variables, and product involvement was the dependent variable. The

three ANOVA assumptions were met. Respondent scores were obtained independently of one another. A histogram of the product involvement scores revealed the data formed a relatively normal bell curve. Homogeneity of variance was assessed using a Levene's test. The data met the assumption, where $F(8, 153) = 1.664, p = .111$.

The ANOVA results for product involvement revealed no statistically significant interaction existed between linkage type and club commitment, where $F(4, 153) = .528, p = .715$ (Table 9). Respondents with higher levels of commitment to the club and members with lower levels of commitment to the club expressed similar interest in learning about the innovations when they heard about the products from a friend, presentation, or website. There was no statistically significant main effect of linkage type on product involvement, where $F(2, 153) = .848, p = .430$. How respondents heard about the innovations had no effect on their desire to learn more about them. There was a statistically significant main effect of club commitment on product involvement, where $F(2, 153) = 5.331, p = .006, \eta^2 = .065$. The Tukey post hoc test revealed respondents with high club commitment ($M = 4.81, SD = 1.270$) and medium club commitment ($M = 4.81, SD = 1.379$) expressed more interest in learning about the innovations versus respondents with low club commitment ($M = 4.00, SD = 1.586$) at the .05 alpha level. The club commitment main effect's η^2 was .065. Seven percent of the variance in product involvement was accounted for by club commitment. A small relationship exists between product involvement and club commitment.

In the second 3x3 ANOVA, linkage type and club commitment were the independent variables, and purchase intentions was the dependent variable. The three ANOVA assumptions were met. Respondent scores were obtained independently of one

another. A histogram of the purchase intentions scores revealed the data formed a relatively normal bell curve. Homogeneity of variance was assessed using a Levene's test. The data met the assumption, where $F(8, 153) = .736, p = .660$.

The ANOVA results revealed no statistically significant interaction existed between linkage type and club commitment on purchase intentions, where $F(4, 153) = 2.029, p = .093$ (Table 10). Respondents with higher levels of commitment to the club and members with lower levels of commitment to the club expressed similar interest in purchasing the innovations when they heard about them through the three linkages. There was no statistically significant main effect of linkage type on purchase intentions, where $F(2, 153) = 2.375, p = .096$. Linkage type did not influence a respondent's desire to purchase the innovations. There was a statistically significant main effect of club commitment on purchase intentions, where $F(2, 153) = 3.552, p = .031, \eta^2 = .044$. Club members with both higher and lower levels of club commitment expressed similar interest in purchasing the innovations. However, the Tukey post hoc test did not reveal statistically significant differences between respondents based on their club commitment levels (Table 11). The club commitment main effect's η^2 was .044. Four percent of the variance in purchase intentions was accounted for by club commitment. A small relationship exists between purchase intentions and club commitment.

Table 9.

Factorial ANOVA: Linkage Type and Club Commitment on Product Involvement

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>	η^2
Linkage	3.405	2	1.703	0.848	0.430	0.011
Club Commit	21.415	2	10.707	5.331	0.006	0.065
Linkage x Club Commit	4.245	4	1.061	0.528	0.715	0.014
Error	307.314	153	2.009			
Total	336.998	161				

Table 10.

Factorial ANOVA: Linkage Type and Club Commitment on Purchase Intentions

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>	η^2
Linkage	12.209	2	6.104	2.375	0.096	0.030
Club Commit	18.261	2	9.131	3.552	0.031	0.044
Linkage x Club Commit	20.864	4	5.216	2.029	0.093	0.050
Error	393.293	153	2.571			
Total	440.448	162				

Table 11.

Standard Deviations and Means for Linkage Type and Club Commitment

Club Commitment	Linkage Type	Product Involvement		Purchase Intentions	
		Mean	Standard Deviation	Mean	Standard Deviation
Low	Relational	3.88	1.27	2.89	1.52
	Operational	4.06	1.61	3.59	1.52
	Technological	3.99	1.78	3.53	2.05
	Total	4.00	1.59	3.44	1.71
Medium	Relational	4.82	1.38	3.73	1.68
	Operational	4.65	1.43	3.81	1.59
	Technological	4.96	1.39	4.33	1.50
	Total	4.81	1.38	3.95	1.59
High	Relational	4.94	1.66	4.57	1.73
	Operational	4.36	1.02	3.27	1.38
	Technological	5.16	0.97	4.74	1.38
	Total	4.81	1.27	4.17	1.62
Total	Relational	4.69	1.50	3.89	1.75
	Operational	4.34	1.38	3.55	1.49
	Technological	4.72	1.47	4.22	1.70
	Total	4.57	1.45	3.87	1.65

The study assessed six interactions--linkage type with innovation type, sport commitment, and club commitment--for their effect on product involvement and purchase intentions. Of the six interactions, only one was statistically significant, linkage type with sport commitment on purchase intentions. The study also assessed the eight main effects of linkage type, innovation type, sport commitment, and club commitment on product involvement and purchase intentions. Five of these were statistically

significant--innovation type on purchase intentions, sport commitment on product involvement and purchase intentions, and club commitment on product involvement and purchase intentions. Despite the limited amount of statistical significance found, important theoretical and practical findings were revealed and will be discussed in the next chapter.

CHAPTER V

DISCUSSION

Introduction

The current study examined the role of communication in the dissemination of innovations. Previous studies of innovations have used the diffusion of innovations theory to understand new goods and services more fully (Rogers, 2003). The current study departed from the theory and instead used systems theory with a linkages conceptual framework. The theory and framework were chosen to counter some of the limitations of diffusion theory. One frequently cited criticism of the diffusion theory is the theory's assertion that innovations move in a linear fashion through a system (Tanner & Fiore, 2004). Instead, systems theory and the linkages conceptual framework provide a better description of the sport system and sporting goods industry for several reasons.

The sport system is comprised of a complex group of individuals and organizations: manufacturers and retailers, consumers, governing bodies, communications providers, and sponsors and strategic partners (Chelladurai, 2005; Stern, 1979; Thibault & Harvey, 1997). The sport industry is classified as one in which its members simultaneously cooperate and compete (Mullin et al., 2007) and are connected through a series of linkages. These linkages can encourage the flow of both information and resources among the various system members when they cooperate but can also discourage the flow when they compete (Pfeffer & Salancik, 2003). Additionally, within

the sport system, variables like sport commitment and club commitment can influence how individuals and organizations relate to one another and how they respond to the various products introduced within the system. The product introductions and the subsequent responses to the products can come from multiple places within the system, and one individual's or organization's response can create a ripple effect throughout the entire system (Knoke, 2001). Because of the complexity of the sport industry and the flow of information and resources within it, systems theory and the linkages conceptual framework were chosen to examine the industry and its innovations in more detail.

The study focused on linkages as the vehicles through which information about innovations is spread. Three linkage types, relational, operational, and technological, were explored in greater detail (Lasky, 2010). Relational linkages connect sports participants and help them share product information through personal conversations and discussions with one another. Operational linkages like competitions and presentations feature innovations during formal and informal sporting events. They give participants the chance to see new sporting goods and services in action. Finally, technological linkages aid information seekers in collecting information through online and offline tools. Newsletters and websites provide ways for participants to learn about the latest sporting goods and services. The linkages also give sporting goods manufacturers, information providers, and innovators the ability to share their expertise and gather information important to creating new products (Franke & Shah, 2003; Valente, 1996). The linkage types were examined for their individual and combined effects on the dissemination of innovations, operationalized as product involvement and purchase intentions.

The study also explored innovation type and whether an innovation as a good or service had an effect on an individual's decision to learn more about or purchase the innovation. The study also examined sport commitment and club commitment, assessing the effects of an individual's commitment to a sport or to a sports club on the innovation dissemination process. Sport commitment and club commitment reflect an individual's desire to continue participating in a sport or sports club, respectively (Haggerty & Denomme, 1991; Scanlan et al., 1993). Participants with both commitment types express greater interest in learning about, purchasing, and even creating new sporting goods and services (Franke & Shah, 2003). Manufacturers need to understand how innovation type, linkage type, sport commitment, and club commitment operate in concert and influence the dissemination of innovations, measured with the variables product involvement and purchase intentions.

Results Summary

The study addressed four research questions regarding the roles of linkages with innovation type, sport commitment, and club commitment in the dissemination of innovations, operationalized as product involvement and purchase intentions.

RQ1. Linkage Type. How respondents learned about the innovations did not influence their product involvement or purchase intentions. Respondents had similar levels of interest in learning about the innovations when they heard about them from a friend, during a presentation, or online. Respondents also had similar levels of interest in purchasing the innovations when they heard about them through the three linkages.

RQ2. Innovation Type. How respondents learned about the innovations, whether a good or a service, did not influence their product involvement or purchase intentions. Respondents expressed similar levels of interest in both the good and the service when they heard about the innovation from a friend, during a presentation, or on a website. Respondents also expressed similar levels of interest in purchasing the good and the service when they heard about the innovation through the three linkage types. However, the type of product, whether a good or service, did have an effect on an individual's desire to purchase an innovation. Respondents expressed greater interest in purchasing the good versus the service.

RQ3. Sport Commitment. How respondents learned about the innovations influenced their purchase intentions based on their levels of sport commitment. Respondents highly committed to the sport had higher levels of purchase intentions versus respondents with lower sport commitment when they heard about innovations through the three linkages. Respondents with high sport commitment had the highest levels of purchase intentions when using the technological and relational linkages. Those respondents with medium sport commitment reported their highest purchase intentions when hearing about the innovations through technological linkages. Finally, respondents with low sport commitment expressed their highest levels of purchase intentions when using the operational linkage. Examining sport commitment in isolation revealed respondents more committed to the sport expressed greater product involvement and purchase intentions versus respondents with less sport commitment. Respondents more committed to continuing their sport participation expressed more interest in learning

about and purchasing the innovations, while those with lower levels of sport commitment expressed lower levels of interest in doing so.

RQ4. Club Commitment. How respondents learned about the innovations did not influence their product involvement or purchase intentions, regardless of their levels of commitment to the club. Respondents with higher levels of commitment to the club and members with lower levels of commitment to the club expressed similar interest in learning about the innovations when they heard about the products from a friend, presentation, or website. Respondents with higher levels of commitment to the club and members with lower levels of commitment to the club expressed similar interest in purchasing the innovation when they heard about them through the three linkages Yet examining club commitment alone showed respondents more committed to the club expressed greater product involvement and purchase intentions when compared to respondents with lower levels of club commitment. Respondents more committed to the club were more interested in learning about and buying the innovations, while those with lower levels of commitment to the club were less interested in doing so.

Major Theoretical Implications

The current study results provided several findings regarding the role of linkages within the innovation dissemination process: (a) linkage type alone did not influence product involvement or purchase intentions, (b) innovation type influenced purchase intentions, (c) commitment affected which linkage type was most effective in influencing purchase intentions, and (d) commitment alone influenced product involvement and purchase intentions.

Linkage Type. Linkage type did not influence product involvement or purchase intentions. Linkages or how club members heard about innovations did not have an effect on their desire to learn more about or purchase the products. Club members viewed the three linkage types similarly. They expressed equal interest in the innovations, whether they heard about the new products from a friend, during a presentation, or via a website. Previous studies have reported mixed results regarding linkage type. For example, Lüthje (2003) reported some participants prefer to learn about products from other participants, while others like to receive information from sports magazines or local sporting goods stores. Other studies examining consumer products like wine and music have found individuals prefer to gather information from a variety of sources--advertisements, product demonstrations and displays, and friends--prior to making a purchasing decision (Chaney, 2001; Valente, 2006).

In the current study, respondents expressed relatively equal levels of product involvement and purchase intentions when receiving information from the three linkages. The finding is supported by previous research indicating individuals may use a variety of sources to collect innovation information and develop a more comprehensive view of the product under consideration (Chaney, 2001). Club members may have viewed all three linkages as valuable information sources from which to learn about cycling innovations. They could gather information from the three sources with little to no expense invested aside from their personal time and effort. How they heard about the innovations did not influence their decisions to learn more about the products or purchase them.

Linkage Type and Innovation Type. Linkage type alone did not influence product involvement or purchase intentions. Similarly, combining linkage type with

innovation type did not influence either variable. How club members learned about the good or the service had no effect on their decisions to become more involved with or purchase the innovations. The finding contrasted with previous studies which revealed consumers respond differently to innovations based on how they heard about the products. Researchers have reported consumers often have higher levels of uncertainty regarding services and require more detailed information about them before making purchasing decisions. As a result, service providers may use their websites to display in-depth information about the product offerings to consumers (Bodkin & Perry, 2004). Szymanski (2001) compared the effectiveness of various information delivery methods and found consumers responded more favorably to information transmitted over the phone for a service and during a face-to-face presentation for a good. Despite these findings, in the current study, club members expressed similar levels of interest in learning about and purchasing the good and the service when they heard about the innovations through the three linkages.

However, examining innovation type in isolation revealed the variable was critical to the innovation dissemination process as it significantly influenced purchase intentions. When making purchasing decisions, club members favored the tangible GPS device over the intangible cycling specific training services. The finding was supported by previous research which indicated consumers prefer tangible goods to intangible services. Researchers found consumers frequently viewed services with increased uncertainty because of product intangibility and heterogeneity (Bebko, 2000; Vargo, 2004). Laroche et al. (2003) also found individuals felt they risked more when purchasing services as they were unclear of what benefits they would receive from their purchases.

Because of this uncertainty, individuals were less likely to buy intangible services versus more tangible goods (Laroche et al., 2003). In the current study, innovation type did not influence product involvement but did significantly affect purchase intentions. Club members may be equally willing to learn about goods and services, but they may require additional information prior to actually purchasing the service, information like tangible evidence of the service's features and potential benefits.

Scenarios were used to assess the levels of product involvement and purchase intentions club members had for two cycling innovations. A field test was used to preliminarily assess the scenarios prior to distributing them to survey participants. Positive results were received regarding the scenarios and survey items. However, the survey results may have reflected a difference in responses based on the scenario wording. The good was described as a "cycling-specific GPS (global positioning system) device," while the service was described as "customized training services. The description for the good was more detailed than the service and could have influenced the responses club members provided. Instead of the more generic description used, the service could have been described with a coach's name or the type of service actually provided (e.g., thirty-minute evaluation of pedaling efficiency). Future studies using product scenarios should include specific descriptions of the goods and services to create a clearer picture in the survey participant's mind.

Linkage Type and Commitment. The study also examined linkage type with sport commitment and club commitment to determine their interaction effects on the dissemination of innovations. The combination of sport commitment with linkage type influenced purchase intentions. Members with higher levels of sport commitment had

higher levels of purchase intentions versus members with less sport commitment when they heard about the innovations through the three linkages. The technological and relational linkages were more effective in generating purchase intentions among club members with high sport commitment, while the operational linkage was most effective for club members with lower levels of sport commitment. Conversely, linkage type with club commitment did not influence purchase intentions. Club members with higher levels of commitment to the club shared similar interests in purchasing the innovations with less committed members. Additionally, neither sport commitment nor club commitment with linkage type influenced a club member's product involvement. Members with higher levels of sport commitment and club commitment shared similar levels of product involvement with less committed members when they heard about the innovations through the three linkages.

Previous studies examining linkage type with commitment variables have reported mixed results. Some studies have shown more committed participants willingly accept information from a variety of sources, including from other sports participants and during informal practices and formal sporting events (Lüthje et al., 2005; Tietz et al., 2004). On the other hand, Lüthje (2003) examined highly committed participants and found these participants preferred to collect information from other participants, a relational linkage, as opposed to using linkages like reading sports magazines and visiting local sporting goods stores (Lüthje, 2003). The latter study provides partial support for the current study's finding, which revealed club members with higher levels of sport commitment expressed higher levels of purchase intentions when hearing about innovations through the relational linkage. These same club members also had higher

levels of purchase intentions via the technological linkage. The combination of linkage type with sport commitment level influenced the effectiveness of innovation dissemination process, whereby relational and technological linkages were more effective with high sport commitment club members and the operational linkage proved more effective with members with lower levels of sport commitment.

However, the results revealed no statistically significant interaction between linkage type and the commitment variables on product involvement or between linkage type and club commitment on purchase intentions. Respondents indicated similar levels of interest in learning about and buying the innovations, regardless of their commitment to the club. During sports activities and club events, club members with varying levels of club commitment discuss sporting goods and services. The lack of interaction between linkage type and club commitment may indicate club members go through a socialization process whereby they are exposed to cycling innovations through other club members (Albert, 1999; Kirk & MacPhail, 2006). The socialization process has the same effect on all club members, whether they have higher or lower levels club commitment. Club members express similar levels of interest in learning about innovations.

Yet once club members face actual purchasing decisions, their level of commitment to the sport and how they learn about the sports product play more heavily into their decisions to buy the innovation. Sport commitment is an essential part of the dissemination of innovations when combined with linkage type. This finding may indicate an important difference between sporting goods and services and other consumer products like automobiles or appliances. Sports and their related goods and services are arguably different from other consumer products for several reasons. Sports have an

inherent social component, and consumers as sports spectators and participants readily enjoy sports with other fans. Sports consumers often have "strong personal and emotional identification" regarding their favorite sports, teams, and athletes (Mullin, Hardy, & Sutton, 2007, p. 18). These feelings often lead to heightened levels of devotion and commitment to sports and sporting goods and services, a level of commitment not often found towards other consumer products (Mullin, Hardy, & Sutton, 2007). An individual's commitment to products like cars and computers, while potentially devoted, most likely does not generate the same emotions and behaviors expressed by sports fans. As a result, sport commitment enhances the effectiveness of linkages in a way other commitment types cannot. Thus, individuals with higher levels of commitment to the sport are more readily influenced to purchase the product using one linkage while individuals with less sport commitment are influenced by a different linkage type.

Isolating the commitment variables revealed club members with higher levels of commitment to the sport and club were more interested in learning about and purchasing the innovations. Previous research has shown participants with higher levels of sport commitment and club commitment participate in sporting events and club activities and interact with other participants more frequently. Through their interactions, committed members share product information and may even create their own innovations (Franke & Shah, 2003). Participants with higher levels of sport commitment also purchased more related goods and services (Casper et al., 2007; McGehee et al., 2003). Greater sport commitment correlated with wanting to learn about and purchase products to improve sport performance and enjoyment (Casper et al., 2007; McGehee et al., 2003). In the current study, club members more committed to the sport and club expressed higher

levels of product involvement and purchase intentions. Buying sporting goods can increase commitment, and commitment can lead to purchasing more innovations.

Overall, club members were most influenced by their levels of commitment to the sport and club. Members with higher levels of sport commitment expressed higher levels of purchase intentions when using technological and relational linkages, and members with lower sport commitment had higher levels of purchase intentions with operational linkages. Linkages did not have a significant effect when combined with either club commitment or innovation type. With both variables, club members viewed the three linkage types similarly. Instead sport commitment and club commitment along with innovation type consistently influenced in the innovation dissemination process. Innovation type influenced purchase intentions, and sport commitment and club commitment influenced product involvement and purchase intentions.

Major Practical Findings

Sport commitment and club commitment are essential to the dissemination process and can augment the use of linkages to transmit innovation information to consumers. The study revealed club members with higher levels of both commitment types expressed greater levels of product involvement and purchase intentions. Forty-seven million individuals ride their bikes at least once per year (National Sporting Goods Association, 2008). Sporting goods manufacturers looking to increase product sales should focus on increasing participant commitment levels, encouraging casual cyclists to move from one ride per year to one per month, week, or day. Individuals who ride more often may decide to invest in bikes and related accessories to enhance their sport

performance and enjoyment. Manufacturers must identify and influence consumer attitudes and behaviors linked to commitment. Studies have identified several variables which increase commitment, including enjoyment and involvement opportunities (Casper et al., 2007; Haggerty & Denomme, 1991; Scanlan et al., 1993). Because sport commitment and club commitment are critical to the dissemination of innovations, manufacturers can benefit from helping club members increase their levels of commitment to both.

Different demographic and participation groups present different opportunities. Sporting goods manufacturers can tailor their marketing messages to reach consumers based on their specific commitment levels. Reaching out to highly committed club members who participate in formal bike races and triathlons will dictate a different approach than approaching more casual riders (Mullin, Hardy, & Sutton, 2007). The current study found club members highly committed to the sport responded more favorably to innovation information received through a website or from a friend whereas lesser committed members preferred a presentation, which are traditionally short in length. A short presentation may provide club members with lower levels of sport commitment with an adequate amount of information to make purchasing decisions. Less committed participants may not be willing to invest significant time learning about an innovation, whereas club members with higher levels of sport commitment may require more in-depth information regarding goods and services from friends and family members as well as from cycling websites.

Manufacturers can reach these more highly committed members by providing innovation information on company websites. The sites can offer product reviews,

product manuals, and suggested usage tips (Dumas, 2008; Garmin, 2009). Websites can serve as convenient resources for highly committed club members as they gather relevant innovation information. Club members with higher levels of sport commitment preferred learning about innovations from friends, a relational linkage. Sporting goods manufacturers can leverage this linkage while striving to increase a member's club commitment, another variable critical to the innovation dissemination process. Manufacturers can do this by helping host and support club activities. The events give club members the chance to interact with one another and receive sports-related information, including details about new sporting goods and services. The events allow club members to serve as conduits through which manufacturers can provide product information and expose target consumers to their products. Previous studies have shown word-of-mouth communications to be effective in spreading product information and increasing sales (Duan et al., 2008; Lyons & Henderson, 2005; Tsang & Zhou, 2005). Hearing about innovations from a club member may represent a credible source of information and lead to greater product involvement and purchase intentions, particularly for those members with higher levels of sport commitment.

Cycling manufacturers can use current and previous customers to help with the selling process via word-of-mouth opportunities like customer referrals. They could establish programs to reward customers who refer their friends and family members to a particular retailer or encourage them to purchase from a specific manufacturer. Referring customers could receive benefits such as monetary credit for their latest purchase or credit applied to future purchases. For instance, small custom bike manufacturer Republic Bike recently used Twitter to announce a new referral program. Both the referring and

new customers receive credit for their purchases (Republic Bike, 2010). The referral program provides benefits for new and previous customers who receive product discounts; the manufacturers benefit from free word-of-mouth advertising from satisfied customers.

In addition to Scanlan et al.'s (1993) definition of sport commitment, Mullin et al. (2007) defined sport commitment as "the frequency, duration, and intensity of involvement in a sport or the willingness to expend money, time, and energy in a pattern of sport involvement" (p. 69). Sport organizations seeking to increase sport commitment among their consumers must identify ways to increase how often and how long participants play as well as how much time and money they spend on the sport.

Mullin et al. (2007) used the frequency escalator to categorize sport consumers based on their consumption habits with categories like light, medium, and heavy users. The authors outlined strategies which can be used to move consumers up the frequency escalator from a light to a medium user or from a medium to a heavy user. Medium users should receive incentives to make additional purchases and consume the sport product more frequently. Heavy users should receive services in conjunction with sporting goods purchased, and the services should convey a sense of a higher-quality or a more "elite" offering than what the average consumer would receive.

To target their customers effectively, sport organizations need to first understand the consumers and their levels of commitment to the sport. Club members in the current study were divided into low, medium, and high commitment groups. However, their relatively high average commitment scores ($M = 5.97$, $SD = 1.036$). Their behaviors indicated they were more likely either medium or heavy users on the Mullin et al. (2007)

frequency escalator. The survey respondents belong to a cycling club, participate in club rides, and engage in conversations on the club's listserv, which all indicate their interest in and commitment to the sport. These club members are better described as either medium or heavy users, and sporting goods manufacturers will need to identify appropriate strategies to reach these individuals in efforts to increase their sport commitment levels.

For their medium users, sporting goods manufacturers can focus on increasing the number of purchases made by these relatively committed cycling participants. As members of the cycling club, respondents in the current study are likely to own their own bikes and related accessories like helmets, tires and tubes, pumps, gloves, and apparel. Yet these items are not necessarily one-time purchases. Apparel fashions change, tires and tubes wear out, and innovative cycling equipment is frequently introduced into the marketplace. Sporting goods manufacturers must respond adeptly to this constantly changing environment and capitalize on ways to increase consumer sport commitment.

Sporting goods manufacturers could encourage consumers to make new purchases by offering incentives or loyalty programs. For example, cycling retailer Performance Bicycle offers a loyalty program for its customers. Cyclists pay a \$25 annual membership fee to join "Team Performance" and receive special merchandise discounts. They also accumulate points with each purchase, points which can be used to obtain free merchandise (Performance Bicycle, 2010). Sporting goods manufacturers could partner with other manufacturers and retailers to offer similar programs. For instance, Cervélo only makes bikes, yet they conduct cross-promotions with wheel manufacturer Zipp, handlebar manufacturer Vision, and apparel company Castelli (Cervélo, 2010). A group

of likeminded manufacturers could work together to sell their products and offer a group loyalty program to customers. When cyclists purchase products from the consortium, they would receive points which could later be used to acquire free merchandise or other benefits from the manufacturers. This program would encourage customers to return to the manufacturers for repeat purchases while being rewarded for their loyalty to a particular product or brand.

Additionally, cycling sporting goods manufacturers could offer other one-time promotions. For example, to encourage bike sales Cervélo held a test ride campaign in June 2009, the month before the Tour de France. Potential customers completed an online request form and had the bike of their choice shipped to a local certified Cervélo retailer. Customers then went to the authorized dealer, learned more about the bike from the retailer, and had a chance to ride the bike before making a purchasing decision. Those who purchased bikes during the promotion received a Cervélo cycling jersey, a replica of the ones worn by Cervélo's TestTeam during the 2009 Tour de France. The promotion also raised awareness about the new cycling team and its upcoming performance in the Tour; the promotion also provided incentives for potential consumers to purchase a bike (Cervelo, 2010). The promotion helped reach potential consumers who might have had uncertainty about which bikes to purchase. Having the opportunity to come into a retail store, talk to a salesperson, and take the bike for a test ride may help to mitigate the perceived purchase risk. While in the store, customers may walk around and learn about other products and upcoming activities such as races and touring events. In this way, manufacturers and retailers can form a partnership whereby the manufacturer provides the goods, and the retailer helps to sell the goods in addition to other products in the

store. Cycling manufacturers could also offer a money-back guarantee in conjunction with the test rides. Customers could receive a specific amount of time to ride the bike, whether a few days or a couple of weeks. In the event they are not 100% satisfied, customers can return the bike to the store. Offering the services in conjunction with sporting goods allows manufacturers to reach out to consumers in different ways.

In addition to loyalty programs and sales promotions with other manufacturers and retailers, sporting goods manufacturers could offer customers exclusive club memberships. For instance, bike maker Specialized has two company-specific clubs for its customers. The first club is free to join, and club members receive a newsletter, access to a members-only website, and opportunities to participate in various contests. The second club is for paying members only. They receive a Specialized cycling jersey, subscriptions to two cycling magazines, and a membership card for access to VIP events. Having free and paid memberships allows Specialized to reach out to two customer groups: medium users with moderate levels of commitment to the sport and manufacturer but perhaps a lower willingness to pay for benefits as well as heavy users with higher levels of commitment and a willingness to pay for such benefits (Specialized, 2010b).

For heavy users, Mullin et al. (2007) emphasized the importance of offering services element and adding the prestige of elite benefits. Some club members in the current study had high levels of sport commitment, in some cases registering commitment scores of 7.0 out of 7.0. Some manufacturers have identified opportunities to reach out to these consumers with higher commitment levels--and larger wallets. Bike makers like Cervélo and Trek provide bikes to teams participating in the Tour de France and other major races. They also offer customers a chance to attend the events. For prices

ranging from \$4,000 to \$6,000, highly committed cycling fans can ride a portion of the Tour de France course and see professional cyclists compete during the event. The Trek package emphasizes high-end concierge service and luxury accommodations. The special travel packages allow the manufacturer to reach out to their most high-income customers and provide them with an elite experience while potentially providing information about the various goods and services Trek has to offer (Trek Travel, 2010).

Of course not every cyclist can afford to participate in such exclusive offerings. Yet manufacturers would be well-served by providing a variety of service opportunities to reach more medium and heavy consumers. Manufacturers could make available a variety of services to customers. Club members in the current study are committed to the sport and will likely require cycling-specific services in addition to the bikes and other accessories they have purchased. One service required by virtually all cyclists is bike maintenance. Like automobiles, bicycles require regular maintenance activities like chain, tube, and tire replacements as well as brake, saddle, and handlebar adjustments. Manufacturers often rely on local retailers to provide bike maintenance. They could partner with retailers to offer discounts and promotions similar to automobile manufacturers. Consumers could be rewarded for returning to the authorized dealer where they purchased their bikes for maintenance. Customers making repeat maintenance visits could receive discounted services and be rewarded for their loyalty to the retailer and manufacturer. The manufacturer could keep track of the bikes sold and any maintenance or quality issues. They could also sell aftermarket replacement parts and ensure the repair services would be completed by certified mechanics working at authorized dealers.

Other services manufacturers could provide are shipping bike fit services. Some of the club members in the current study participate in competitive races and travel to other locations. Highly committed cyclists who travel by plane to races would likely appreciate having a professional package their bikes so they arrive in great shape and ready to ride. Cycling manufacturers in conjunction with retailers could provide such a service. Customers would bring their bikes to an authorized dealer a few days before the event and have the bike partially disassembled and packaged for shipping. Less mechanically-inclined customers could arrange to have their bikes shipped to a bike shop or manufacturing facility in the town to which they are traveling. The shop or facility could help reassemble the bike for the event and later disassemble and package it for shipping back to the home site.

Manufacturers could also offer bike fit services. For instance, Specialized offers its Body Geometry Fit. The cycling manufacturer considers the specific cycling needs and physical measurements of customers and helps them choose the best bike for their customer's needs and body type. After the purchase is made, Specialized follows up with customers to ensure their needs are met and assess their satisfaction with the purchases (Specialized, 2010a). These services require more hands-on time and interaction with the customers; however, they may make a lasting impression with the customer who may be inclined to tell others about the benefits of the service and associated products and make repeat purchases from the manufacturer (Mullin et al., 2007).

Specialized promotes its Body Geometry fit service on its website as well as via online social networks Facebook and Twitter (Specialized, 2010a). Other sporting goods manufacturers use online social networks to promote their products. For example,

Cycleops makes indoor trainers and electronics for cyclists. The manufacturer has outfitted several Tour de France teams and is actively involved with numerous professional athletes. Cycleops incorporates suggestions and feedback from the pros about the products into subsequent innovations. The company uses Facebook and Twitter to keep cyclists up-to-date with the latest products and the performances of their sponsored athletes. In turn, these same athletes will also use online social networks to discuss their satisfaction with the products and encourage potential customers to learn more about them. Cyclelops also has a detailed website which provides written information and videos about the products along with training newsletters and athlete blogs. Customers can learn how to use the product and train more effectively by reading information provided on the company website. Providing both product and training information allows the company to deliver a relatively low-cost service to customers and gives customers reasons to return to the site after their initial purchase (Cycleops, 2009).

Websites, online social networks, and now smartphone applications represent additional opportunities for sporting goods manufacturers to reach out to consumers whether they are on their bikes or in front of a computer. Major cycling manufacturers like Specialized and Trek have websites which offer detailed product information about their bikes and accessories. These sport organizations also use online social networks like Facebook and Twitter to share information about the products and to update fans and followers regarding the athletes and teams they support. Sport organizations can also benefit from using smartphone applications to reach consumers. Cellphone manufacturers like Blackberry have created sport applications, including game scores and team and athlete updates (Torrieri, 2010). Yet fewer sport organizations, cycling manufacturers or

otherwise, use smartphone applications to reach out to consumers. One cycling organization is MapMyRide; the company allows cyclists to keep track of their riding mileage and share their favorite rides with other users while at their computer or via Blackberry and iPhone applications (MapMyRide, 2010). An opportunity exists for more sport organizations to use applications to increase awareness about their products and increase the frequency with which they reach out customers.

Both Mullin et al. (2007) and Scanlan et al. (1993) noted the importance of involvement frequency. Sport organizations must provide more opportunities for participants to engage in the sport. Increased participation frequencies can lead to higher levels of sport commitment and the accompanying benefits of longer duration with the sport and more sporting goods purchases. Programs can reward customers for purchasing bikes and related merchandise from manufacturers through discounts, points, contests, and special websites. The manufacturers benefit by reaching out to a key customers who have already purchased cycling sporting goods and may be interested in purchasing more in the future.

Sporting goods manufacturers can also serve as club sponsors. The current study collected data from LBC, a non-profit organization. The club relies on revenues from membership dues and major club events like the annual winter banquet and the Old Kentucky Home Tour (OKHT). The club also receives donations from local sponsors. The donations are typically cash, in-kind, or discounts for club members. In exchange for their sponsorships, the sponsoring companies receive advertising in the club's newsletter and corporate logo placements on OKHT apparel and gear worn by the club's racing team (LBC, 2009). The sponsorships help the club directly and may indirectly increase sport

commitment and club commitment as members participate in various club activities. In turn, the sponsor may receive benefits like increased goodwill and product sales. Dees et al. (2008) found corporate sponsors received both benefits when sponsoring events deemed important to sports spectators. Club leaders could use the activities to strengthen sport commitment and club commitment and retain current club members while potentially attracting new ones to the organization.

In addition to targeting highly committed members, sport goods manufacturers can reach out to club members with lower levels of commitment, who represent a different yet viable target market. These members may have less sport commitment because of limited sport knowledge, job and family obligations, or economic constraints. Providing involvement opportunities may help these club members strengthen their commitment to the sport and club and lead them to purchase more sporting goods and services (Casper et al., 2007; Scanlan et al., 1993). The current study found the lower level sport commitment group preferred learning about innovations during a presentation, an operational linkage. Manufacturers could partner with club leaders to create club activities for members in this commitment group. Cycling retailers and clubs frequently provide events for newer riders, offering classes on bicycle maintenance and how to navigate traffic safely. Manufacturers could create similar activities specifically for members with lower levels of both sport commitment and club commitment. They could help organize, host, and sponsor the events. The manufacturers could conduct lectures on topics such as how to find time to ride during a busy day or how to make cost-conscious cycling equipment purchases. Manufacturers could also bring product samples to the event and give attendees a chance to use them during the sessions. The events

would also give club members the chance to meet other club members, helping to strengthen their commitment levels, while learning about new goods and services.

Other operational linkages include offering demo days and local group rides, which expose club members to different aspects of the sport in low-cost and relatively risk-free settings. For example, bicycle manufacturer Trek sends its employees around the country to conduct product demonstrations and host formal riding events for target consumers. One recent event advertised on the company's website was a women's only ride, where up to 9,000 women of all ages and riding levels could bike through Tucson, Arizona together. Other website event listings encouraged riders to bring a friend to designated local bike shops where they could learn about the latest product offerings, try some of the newest bikes, and meet other local cyclists (Trek, 2009). The events give club members the chance to interact in a fun environment and increase their sport commitment. The events also allow manufacturers to showcase their wares and aid the dissemination of innovations.

Along with club commitment and sport commitment, innovation type influenced the innovation dissemination process, more specifically purchase intentions. Studies examining the differences between goods and services have noted the difficulty of selling services as consumers often feel uncertainty regarding their intangible natures (Laroche et al., 2003; Murray & Schlacter, 1990). This uncertainty makes services more difficult to disseminate as evidenced in the current study. Club members expressed lower levels of purchase intentions for the cycling specific coaching service. They may have had difficulty visualizing the service and had questions regarding what the coach would provide and how they would benefit from such usage. In contrast, club members may

have had less uncertainty about the GPS device. They may have been able to visualize it more readily after seeing the device in magazines and on websites or watching other participants use it during club rides and races.

Sporting goods manufacturers must identify ways to counter negative consumer feelings, which may hamper the innovation dissemination process. For example, manufacturers could provide more detailed information regarding services. They could create detailed websites discussing the various services offered, how much they cost, and their potential benefits. The websites could also include embedded videos which demonstrate the services for viewers like a coach working with an athlete. Additional information about the coaches, testimonials from previous and current consumers, or links to other websites discussing the manufacturer's services could also prove beneficial (Bodkin & Perry, 2004). Sporting goods manufacturers may consider bundling their intangible services with more tangible goods. For example, a series of coaching sessions could be bundled with a printable copy of suggested daily meals and nutritional intake or a DVD of one recorded training session or competitive event (Laroche et al., 2003; Murray & Schlacter, 1990). The uncertainty surrounding intangible services represents a challenge for manufacturers. They must find creative ways to help consumers visualize their products and associated benefits in order to disseminate their services.

Sporting goods manufacturers have numerous opportunities to improve the dissemination of their innovations. They can focus on enhancing consumer sport commitment and club commitment by providing entertaining and informative activities and events. Those manufacturers offering services can improve purchase intentions by

providing more information about the services in efforts to lower uncertainty and perceived risks.

Future Research

Sport commitment and club commitment play critical roles in the dissemination of innovations, influencing both product involvement and purchase intentions. Sporting goods manufacturers need sports participants with high levels of sport commitment. Previous research and the current study results have highlighted the strong connection between sport commitment and product involvement and purchase intentions. To spread information about their products, sporting goods manufacturers need committed consumers who will buy the products and tell others about them. Manufacturers need to understand among their target consumers which buyers have higher levels of sport commitment and why.

Future studies should determine whether differences exist between participation groups based on their levels of sport commitment and club commitment. As discussed above, club racers and triathletes may represent a subset of members with higher sport commitment. Researchers have identified two other groups which provide significant contributions to the development and dissemination of innovations--lead users and athletes with disabilities. Lead users are individuals who have significant levels of sport commitment and product expertise (von Hippel, 1986). They identify market gaps in currently available product offerings and create innovations to fill the gaps. One example of lead users are rodeo kayakers who developed more streamlined kayaks (Hienerth, 2006). These individuals can predict consumer interests up to five years in advance of the

market (Shah, 2007; von Hippel, 2007). They are well connected with other participants in their respective sports communities and can play a critical role in spreading information about innovations (Franke & Shah, 2003). Like lead users, athletes with disabilities often create sporting goods to meet their specific needs (Franke & Shah, 2003). Their innovations often contain features not available for sale, features which can advance the sport and enhance participant performances (Hanebrink, 2002; USHF, 2006). Exploring these demographic groups may provide insights into how to enhance the innovation development and dissemination processes.

Lead users and athletes with disabilities often share their innovations with other participants (Franke & Shah, 2003). The sport industry is frequently characterized by the display of cooperation combined with competition (Franke & Shah, 2003; Hiennerth, 2006). However, in spite of this cooperation, some participants indicate a desire to share and compete but lack the economic resources to do so. Sporting goods and services can be costly. Handcyclists spend a minimum of \$2,000 for their handcycle (Challenged Athletes Fund, 2006). A prosthetic limb may cost a participant \$10,000 to \$15,000 plus additional charges for regular maintenance (McKechnie, 2009). The high entry costs may prevent some athletes from participating. Where linkages can further the dissemination of innovations, variables like product cost can hinder the process.

Future research could examine the relationship between innovations and costs, how participants respond to the prices of sporting goods and services, and how manufacturers can potentially help athletes face economic challenges increase their sport participation and enhance their commitment to the sport. Of course, one challenge is reaching out to this group. Many of the athletes train independently of one another and

may only come together during competitive events (Franke & Shah, 2003). As a result, researchers may receive better results by targeting specific participants or sports. Handcycling would represent one such sport. Participants in the handcycling community stay in lock-step with the innovations used by other road racers and triathletes in terms of innovations; in fact, handcyclists often create innovative products and initiate the dissemination process among able-bodied cyclists (USHF, 2006). Franke and Shah (2003) also reported competitive handcyclists may not form official clubs, yet they still know one another, feel they have formed a community, and attend competitive events and seminars together. Researchers could begin to explore this group in greater detail and use the findings to examine other sports and athletes.

Researchers could also explore gender as a demographic variable where the dissemination of innovations may falter. In the current study, women represented 25% of the respondents, and men accounted for the remaining 75%. The participant ratio contrasted with a more even split between female and male cyclists at the club and national levels (LBC, 2009; LocalCycling, 2006). During the study's data collection process, female club members were approached about participating in the study. Some women declined, saying they were not interested in innovations or felt they would have nothing to contribute to a study about sporting goods. Women represent almost half of the cycling population (LocalCycling, 2006), and they represent a powerful spending force. When it comes to purchasing decisions, women make 80% of those decisions for products like groceries and medicine. They also influence 85% of the decisions for big-ticket items like automobiles (Heffernan, 2002).

Yet when it comes to purchasing and embracing more technologically-advanced products, women often fall behind. Studies have shown women have a lower comfort level for more technologically advanced products versus their male counterparts (Ilie, Van Slyke, Green, & Lou, 2005; National Council for Research on Women, 2000). Studies examining gender differences for technological goods and services have found men assess products based on perceived usefulness while women assess the same products based on perceived ease of use. Women who deem products harder to use or understand tend to shy away from the products regardless of their merit (Ilie et al., 2005). The finding applies to consumer electronics as well as sporting goods like bicycles. Reports have shown women perceive bicycles as complicated and more difficult to understand and maintain (Anderson, 1999; Carpenter, 2010).

Researchers and manufacturers would be well-served to understand how women make purchasing decisions regarding these innovations. Consumer product manufacturers of electronics and automobiles are reaching out to women and developing products to meet their specific needs (Heffernan, 2002). Likewise, sporting goods manufacturers and other sport organizations are providing female-centric opportunities, particularly in the cycling industry. Research has shown women purchase half of the bikes sold--despite their perception of the bikes as complicated pieces of machinery (Anderson, 1999). Cycling magazines like *Bicycling Magazine* include special sections and feature articles specifically for women (MotherNature, 2010). Additionally, cycling manufacturers have also developed bikes to address the unique attributes of a woman's anatomy such as differences in torso and leg lengths and pelvis and shoulder widths (Henry, 2010). These manufacturers are also offering related services specifically for their female consumers.

In addition to the Trek bike ride mentioned above, Nike hosts the annual Nike Women's Marathon held in San Francisco (Nike, 2009). The events allow female participants to explore and learn about innovations in settings where they feel more comfortable interacting with other women (Schlosberg, 2000). Future research could examine the involvement opportunities in greater detail and how they potentially aid the development of sport commitment and the dissemination of innovations among women.

Another area of interest researchers could address are socioeconomic variables, specifically household income and its influence on purchasing decisions. Cycling can be an expensive recreational sport. Local bike specialty shops report the average bike sold in their shops cost just under \$2,000, but high-end bikes can retail for over \$10,000 (Herzog, 2008). The products in the current study scenarios represent a significant expense. The cycling-specific GPS devices retails for \$499 (Garmin, 2009). Coaching services can range from \$100 to \$550 per month depending on the services included in the training package (Train Smart Multisport, 2009). These prices may have influenced the answers respondents provided for the two scenarios. Various cycling organizations have attempted to reach out to consumers with lower levels of discretionary income (Green Street Initiatives, 2009; Re-Cycle, 2009). However, the costs to commit to the sport could likely influence the types of individuals who participate (e.g., their demographic makeup) and their interest and willingness to purchase sporting goods and services. Participants of sports requiring lower investments (e.g., basketball, bowling, disc golf) could be examined in future studies to better understand the dissemination process.

Like with sport commitment, sporting goods manufacturers want to target participants with higher levels of club commitment--and develop commitment among less committed members. Previous studies and the current research revealed more committed club members are interested in learning about sporting goods innovations and sharing information about the products with other participants. The dissemination process may be enhanced through club activities, which give participants the chance to learn about or receive hands-on interaction with a manufacturer's products. Studies could continue to explore the effects of club activities on a member's club commitment, examining the relationship between club commitment and its antecedents and the dissemination process. Variables like demographic or participation groups may explain more about club commitment and how it can help increase purchase intentions. Analyzing club commitment with sport commitment may provide insights into how to increase a club member's product involvement and purchase intentions.

The sport system represents another viable area for researchers. The current study used the conceptual linkages framework to understand the flow of information between sport system members, more specifically between consumers and sporting goods manufacturers. The communication flow was very unidirectional. Manufacturers provided information to consumers through websites and presentations; customers did not provide information back to the manufacturers. This unidirectional flow can potentially impede the dissemination process if new product information only comes from the manufacturers or if customers feel they cannot participate more fully in the process. Cliques can also stall the information flow. Respondents in the current study belonged to a cycling sports club. As club members, they may gain special access to information

about innovations, information not necessarily available to non-club members.

Information may enter into the club through one member who is connected to other sport system members; however, the information may not leave the club if members keep the information within the club's confines. The existence of cliques can impede the flow of information within a system (Wasserman & Faust, 1994). Within the sport system, relational, operational, and technological linkages can promote the multidirectional exchange of information and resources between system members, whereby exchanges can flow up, down, and across the sport system (Knoke, 2001; Senge, 2005). Additional information and input from multiple sources could lead to a faster dissemination of new products as well as spur ideas for subsequent innovations. Researchers could examine the potential benefits of having a more multidirectional flow of information among system members during the innovation dissemination process and how linkages can aid the process.

Linkages can be used to further the flow of innovations and information within the system; they can also be used to spread and exchange resources between system members (Lasky, 2010). Future research could examine the resource exchange process in more detail. Manufacturers are heavily reliant upon other sport system members within the supply chain like raw material providers as well as warehousing, distribution, and shipping organizations. This reliance may create an uneven spread of power among system members, whereby those who control the resources have the most power (Pfeffer & Salancik, 2003). Typically, organizations with the most power will also control the innovation process--dictating which new products are introduced and where in the system, how the products are manufactured and distributed, and who can gain access to

them (Knoke, 2001; Pfeffer & Salancik, 2003). For example, powerful sport governing bodies may limit the types of sporting goods introduced. These limitations would certainly influence--and potentially hamper--the innovation development and dissemination processes (Sheridan, 2007; Trabal, 2008). Researchers could examine the power structures among system members and understand how uneven levels of power influence the different innovation processes.

Limitations

Several limitations existed with the study. First, the study focused on a single sport and sports club within the cycling industry, and the majority of respondents were men. The cyclists in this study may have provided different responses as compared to other cycling club members or cyclists in general.

Second, survey participants were limited to members attending club rides and those accessing an online survey. An attempt was made to solicit responses from a wide variety of riders; however, surveys were only collected from 18% of the club membership. Those not participating in the survey may have had different responses.

Finally, the sport commitment and club commitment levels were skewed as club members who responded to the survey had higher levels of both commitment types. Surveying other cyclists, including club members less committed to the sport and club and non-club members, may have generated different responses. Caution should be used when generalizing the findings to the cycling club or other organizations within the sporting goods industry.

Summary of the Study

US consumers spend \$87 million annually on sporting goods and services (National Sporting Goods Association, 2008). Each year sporting goods manufacturers also spend millions of dollars creating innovative products for consumers looking to improve their playing performances and sport enjoyment (Reisinger, 2002). Manufacturers want to receive adequate returns on their research and development investments and create innovations consumers support and want to buy (Berman & McLaughlin, 1973). To facilitate the dissemination of innovations, manufacturers provide product information about their innovations to increase product awareness and help consumers make informed purchasing decisions (Rogers, 2003).

Information about innovations can be transmitted through three linkage types. Relational linkages represent the sharing of information between friends, family, and sports participants. Operational linkages like competitive events allow manufacturers to display their innovations during formal and informal sporting events. Technological linkages give sports participants the opportunity to gather information through the Internet and other communications tools (Lasky, 2010). Linkages play an important role in the dissemination of innovations, operationalized as product involvement and purchase intentions. The type of innovation--whether a good or service--and an individual's commitment to the sport and related sports clubs can also aid the dissemination process.

The current study explored the role of communication within the dissemination of innovations. More specifically, the study examined the individual and combined effects of linkage type with innovation type, sport commitment, and club commitment on product involvement and purchase intentions. The results revealed (a) linkage type alone

did not influence product involvement or purchase intentions, (b) innovation type influenced purchase intentions, (c) commitment affected which linkage type was most effective in influencing purchase intentions, and (d) commitment alone influenced product involvement and purchase intentions.

Sporting goods manufacturers can use the study's findings to aid the dissemination of their own innovations. They can strive to boost participant commitment levels by creating outlets where individuals can participate in sports and club events and increase their enjoyment of and involvement with the sport, both of which are antecedents to sport commitment and club commitment. Future research can also focus on these antecedents as they relate to different participation groups. Understanding influential variables and participation demographic groups will aid researchers and manufacturers in spreading information about new sports products and further the dissemination of innovations.

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APPENDICES

APPENDIX A

Examining the Change Process in Sport

September 30, 2009

Dear Louisville Bicycle Club member:

You are being invited to participate in a research study by answering survey questions about the change process in sport. There are no known risks for your participation in this research study. The information collected may not benefit you directly. The information learned in this study may be helpful to others. The information you provide will help to identify how innovations move through the sport system. Survey responses will be stored at the University of Louisville in the Department of Health and Sport Sciences. The survey will take approximately 10 minutes to complete.

Individuals from the Department of Health and Sport Sciences, the Institutional Review Board (IRB), the Human Subjects Protection Program Office (HSPPO), and other regulatory agencies may inspect these records. In all other respects, however, the data will be held in confidence to the extent permitted by law. Should the data be published, your identity will not be disclosed.

Taking part in this study is voluntary. By completing this study you agree to take part in this research study. You do not have to answer any questions that make you uncomfortable. You may choose not to take part at all. If you decide to be in this study you may stop taking part at any time. If you decide not to be in this study or if you stop taking part at any time, you will not lose any benefits for which you may qualify.

If you have any questions, concerns, or complaints about the research study, please contact: Dr. T. Christopher Greenwell at tcgreenwell@louisville.edu or (502) 852-0555.

If you have any questions about your rights as a research subject, you may call the Human Subjects Protection Program Office at (502) 852-5188. You can discuss any questions about your rights as a research subject, in private, with a member of the Institutional Review Board (IRB). You may also call this number if you have other questions about the research, and you cannot reach the study doctor, or want to talk to someone else. The IRB is an independent committee made up of people from the University community, staff of the institutions, as well as people from the community not connected with these institutions. The IRB has reviewed this research study.

If you have concerns or complaints about the research or research staff and you do not wish to give your name, you may call 1-877-852-1167. This is a 24 hour hot line answered by people who do not work at the University of Louisville.

Sincerely,

Marion E. Hambrick
Dr. T. Christopher Greenwell

APPENDIX B

Hanging out with a group of friends, you and others start to discuss the newest innovations featured during the Tour de France. Several friends mention new **GPS (global positioning system) devices**. Your friends discuss the features and benefits, including improved cycling performance.

Assuming price is not a factor, please answer the questions below by circling a number from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*).

	Strongly Disagree					Strongly Agree	
I would be interested in reading about this product.	1	2	3	4	5	6	7
I would read a cycling magazine's article about this product.	1	2	3	4	5	6	7
I would pay attention to ads for this product.	1	2	3	4	5	6	7
I would talk about this product with other people.	1	2	3	4	5	6	7
This product is relevant to me.	1	2	3	4	5	6	7
This product does not matter to me.	1	2	3	4	5	6	7
This product is of no concern to me.	1	2	3	4	5	6	7
This product is important to me.	1	2	3	4	5	6	7
I would purchase the product.	1	2	3	4	5	6	7
I would consider buying the product.	1	2	3	4	5	6	7
The probability that I would consider buying is high.	1	2	3	4	5	6	7
I am dedicated to cycling.	1	2	3	4	5	6	7

	Strongly Disagree					Strongly Agree	
It would be hard for me to quit.	1	2	3	4	5	6	7
I am determined to keep cycling.	1	2	3	4	5	6	7
I would be willing to do anything to keep cycling.	1	2	3	4	5	6	7
It would be harder to find a more worthwhile club to join than this one.	1	2	3	4	5	6	7
If all other factors would permit me, I intend to remain in the club.	1	2	3	4	5	6	7
I feel that the club's activities are worthwhile.	1	2	3	4	5	6	7
I can see how my input to the club contributes to its overall success.	1	2	3	4	5	6	7
I am proud of the club to which I belong.	1	2	3	4	5	6	7
I look forward to club activities.	1	2	3	4	5	6	7
The cycling change introduced was a new cycling part.	1	2	3	4	5	6	7
I learned about the change at dinner with fellow club members.	1	2	3	4	5	6	7
I learned about the change while watching television.	1	2	3	4	5	6	7

Gender: ____ Female ____ Male

Are you a member of the Louisville Bicycle Club? ____ Yes ____ No

If yes, how long have you been a member? ____ Years ____ Months

How many rides do you complete with the club? ____ rides per week

Thank you for completing this survey. Please fill out the attached tear-off form to be entered into a drawing for a \$100 gift certificate from your favorite local bicycle store!

Prior to a club ride, a **presentation** is given regarding the newest innovations featured during the Tour de France. Featured are new **cycling-specific GPS (global positioning system) devices**. The presentation discusses the features and benefits, including improved cycling performance.

Assuming price is not a factor, please answer the questions below by circling a number from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*).

	Strongly Disagree					Strongly Agree	
I would be interested in reading about this product.	1	2	3	4	5	6	7
I would read a cycling magazine's article about this product.	1	2	3	4	5	6	7
I would pay attention to ads for this product.	1	2	3	4	5	6	7
I would talk about this product with other people.	1	2	3	4	5	6	7
This product is relevant to me.	1	2	3	4	5	6	7
This product does not matter to me.	1	2	3	4	5	6	7
This product is of no concern to me.	1	2	3	4	5	6	7
This product is important to me.	1	2	3	4	5	6	7
I would purchase the product.	1	2	3	4	5	6	7
I would consider buying the product.	1	2	3	4	5	6	7
The probability that I would consider buying is high.	1	2	3	4	5	6	7
I am dedicated to cycling.	1	2	3	4	5	6	7
It would be hard for me to quit.	1	2	3	4	5	6	7
I am determined to keep cycling.	1	2	3	4	5	6	7
I would be willing to do anything to keep cycling.	1	2	3	4	5	6	7

	Strongly Disagree					Strongly Agree	
It would be harder to find a more worthwhile club to join than this one.	1	2	3	4	5	6	7
If all other factors would permit me, I intend to remain in the club.	1	2	3	4	5	6	7
I feel that the club's activities are worthwhile.	1	2	3	4	5	6	7
I can see how my input to the club contributes to its overall success.	1	2	3	4	5	6	7
I am proud of the club to which I belong.	1	2	3	4	5	6	7
I look forward to club activities.	1	2	3	4	5	6	7
The cycling change introduced was a new cycling part.	1	2	3	4	5	6	7
I learned about the change at dinner with fellow club members.	1	2	3	4	5	6	7
I learned about the change while watching television.	1	2	3	4	5	6	7

Gender: ___ Female ___ Male

Are you a member of the Louisville Bicycle Club? ___ Yes ___ No

If yes, how long have you been a member? ___ Years ___ Months

How many rides do you complete with the club? ___ rides per week

Thank you for completing this survey. Please fill out the attached tear-off form to be entered into a drawing for a \$100 gift certificate from your favorite local bicycle store!

While online, you go to several **cycling websites** which discuss the newest innovations featured during the Tour de France. Several websites mention the new **cycling-specific GPS (global positioning system) devices**. The websites discuss the features and benefits, including improved cycling performance.

Assuming price is not a factor, please answer the questions below by circling a number from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*).

	Strongly Disagree					Strongly Agree	
I would be interested in reading about this product.	1	2	3	4	5	6	7
I would read a cycling magazine's article about this product.	1	2	3	4	5	6	7
I would pay attention to ads for this product.	1	2	3	4	5	6	7
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This product is relevant to me.	1	2	3	4	5	6	7
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I would purchase the product.	1	2	3	4	5	6	7
I would consider buying the product.	1	2	3	4	5	6	7
The probability that I would consider buying is high.	1	2	3	4	5	6	7
I am dedicated to cycling.	1	2	3	4	5	6	7
It would be hard for me to quit.	1	2	3	4	5	6	7
I am determined to keep cycling.	1	2	3	4	5	6	7
I would be willing to do anything to keep cycling.	1	2	3	4	5	6	7

	Strongly Disagree					Strongly Agree	
It would be harder to find a more worthwhile club to join than this one.	1	2	3	4	5	6	7
If all other factors would permit me, I intend to remain in the club.	1	2	3	4	5	6	7
I feel that the club's activities are worthwhile.	1	2	3	4	5	6	7
I can see how my input to the club contributes to its overall success.	1	2	3	4	5	6	7
I am proud of the club to which I belong.	1	2	3	4	5	6	7
I look forward to club activities.	1	2	3	4	5	6	7
The cycling change introduced was a new cycling part.	1	2	3	4	5	6	7
I learned about the change at dinner with fellow club members.	1	2	3	4	5	6	7
I learned about the change while watching television.	1	2	3	4	5	6	7

Gender: ___ Female ___ Male

Are you a member of the Louisville Bicycle Club? ___ Yes ___ No

If yes, how long have you been a member? ___ Years ___ Months

How many rides do you complete with the club? ___ rides per week

Thank you for completing this survey. Please fill out the attached tear-off form to be entered into a drawing for a \$100 gift certificate from your favorite local bicycle store!

Hanging out with a group of friends, you and others start to discuss the newest innovations featured during the Tour de France. Several friends mention new **customized training services**. Your friends discuss the features and benefits, including improved cycling performance.

Assuming price is not a factor, please answer the questions below by circling a number from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*).

	Strongly Disagree					Strongly Agree	
I would be interested in reading about this product.	1	2	3	4	5	6	7
I would read a cycling magazine's article about this product.	1	2	3	4	5	6	7
I would pay attention to ads for this product.	1	2	3	4	5	6	7
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I am determined to keep cycling.	1	2	3	4	5	6	7
I would be willing to do anything to keep cycling.	1	2	3	4	5	6	7

	Strongly Disagree					Strongly Agree	
It would be harder to find a more worthwhile club to join than this one.	1	2	3	4	5	6	7
If all other factors would permit me, I intend to remain in the club.	1	2	3	4	5	6	7
I feel that the club's activities are worthwhile.	1	2	3	4	5	6	7
I can see how my input to the club contributes to its overall success.	1	2	3	4	5	6	7
I am proud of the club to which I belong.	1	2	3	4	5	6	7
I look forward to club activities.	1	2	3	4	5	6	7
The cycling change introduced was a new cycling part.	1	2	3	4	5	6	7
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I learned about the change while watching television.	1	2	3	4	5	6	7

Gender: ____ Female ____ Male

Are you a member of the Louisville Bicycle Club? ____ Yes ____ No

If yes, how long have you been a member? ____ Years ____ Months

How many rides do you complete with the club? ____ rides per week

Thank you for completing this survey. Please fill out the attached tear-off form to be entered into a drawing for a \$100 gift certificate from your favorite local bicycle store!

Prior to a club ride, a **presentation** is given regarding the newest innovations featured during the Tour de France. Featured are new **customized training services**. The presentation discusses the features and benefits, including improved cycling performance.

Assuming price is not a factor, please answer the questions below by circling a number from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*).

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I learned about the change while watching television.	1	2	3	4	5	6	7

Gender: ____ Female ____ Male

Are you a member of the Louisville Bicycle Club? ____ Yes ____ No

If yes, how long have you been a member? ____ Years ____ Months

How many rides do you complete with the club? ____ rides per week

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CURRICULUM VITAE

Marion E. Hambrick

Work Address

Department of Health & Sport Sciences
University of Louisville
HP/Theater Arts - Room 100
Louisville, KY 40292
Office: (502) 852-5039
marion.hambrick@louisville.edu

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5831 Haven Manor Way
Louisville, KY 40228
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mehambrick@gmail.com

CURRENT POSITION

Doctoral Student and Graduate Assistant
University of Louisville, Sport Administration Program, Louisville, Kentucky

Dissertation: Examining the innovation process in the bicycling industry
Co-Chairs: T. Christopher Greenwell, PhD & Susan G. Lasky, PhD

EDUCATION

PhD Educational Leadership & Organizational Development - Sport Administration
University of Louisville, Louisville, KY, Spring 2010 (anticipated graduation)

MBA Finance
University of Kentucky, Lexington, KY, December 1996

BA Finance
Transylvania University, Lexington, KY, June 1995

PROFESSIONAL WORK EXPERIENCE

Kentucky Derby Festival, Louisville, KY **August 2009 - Present**
Marketing Intern

General Electric Co., Louisville, KY **July 2003 - Present**
Financial Analyst

ProQuest Co., Louisville, KY **July 2001 - July 2003**
Editorial Assistant

General Electric Co., Stamford, CT
Corporate Auditor

August 1999 - January 2001

General Electric Co., Louisville, KY, Hong Kong
Financial Management Program Member

February 1996 - July 1999

TEACHING EXPERIENCE

University of Louisville, Louisville, KY

August 2008 - Present

Courses Taught: Responsible for preparation and delivery of all course materials, including lectures, presentation slides, exams, assignments, case studies, and Blackboard course design.

SPAD 404 Financial Principles in Sport - Fall 2008, Spring 2009, Fall 2009
SPAD 383 Sport Marketing - Spring 2010

Guest Lectures: Delivered multiple guest lectures on a variety of pertinent topics.

SPAD 381 Principles of Sport Administration
SPAD 389 Legal Aspects of Sport
SPAD 689 Legal Aspects in the Sport Industry
ELFH 701 Intermediate Statistics
ELFH 710 Doctoral Seminar in Educational Leadership

RESEARCH

Refereed Publications

Moorman, A. M., & **Hambrick, M. E.** (2009). To license or not to license: That is the question for professional sport leagues and the NCAA. *Sport Marketing Quarterly*, 18, 160-164.

Hambrick, M. E., & Moorman, A. M. (2008). NASCAR puts the brakes on AT&T: Sponsorship conflicts of interest and contractual rights. *Sport Marketing Quarterly*, 17, 54-56.

Scholarly Presentations

Hambrick, M. E., Simmons, J. M., Greenhalgh, G. P., & Greenwell, T. C. (2010, May). *Understanding athletes' use of Twitter: A content analysis of athlete tweets*. Presented at the annual North American Society for Sport Management, Tampa, FL.

- Moorman, A. M., Greenhalgh, G. P., **Hambrick, M. E.**, & Simmons, J. M. (2010, March). *"Run 'til somebody quits": An examination of procedural and governance repercussions following the death of a Kentucky high school football player.* Presented at the annual Sport & Recreation Law Association, Albuquerque, NM.
- Greenhalgh, G. P., Simmons, J. M., **Hambrick, M. E.**, Greenwell, T. C., Tubbs, T., & Short, K. J. (2009, October). *Finding their niche: Predicting spectator support for non-mainstream sports.* Presented at the annual conference of the Sport Marketing Association, Cleveland, OH.
- Hambrick, M. E.** (2009, April). *Examining the change process in sport.* Presented at the annual Spring Research Conference, Louisville, KY.
- Hambrick, M. E.**, Simmons, J. M., Greenhalgh, G. P., & Brownlee, E. A. (2009, March). *Grading the alcohol policies of professional sports leagues: A practical application of the dram shop statutes.* Presented at the annual conference of the Sport & Recreation Law Association, San Antonio, TX.
- Brownlee, E. A., Greenwell, T. C., & **Hambrick, M. E.** (2008, May). *Sponsorship effectiveness in women's sport.* Presented at the annual conference of the North American Society for Sport Management, Toronto, Ontario.
- Hambrick, M. E.** (2008, February). *Putting the brakes on corporate sponsorship: AT&T Mobility, LLC v. NASCAR.* Presented at the annual conference of the Sport & Recreation Law Association, Myrtle Beach, SC.

Scholarly Works in Progress

- Hambrick, M. E.**, Simmons, J. M., Greenhalgh, G. P., & Greenwell, T. C. (In review). *Twitter in sport: A content analysis.* Submitted to *Sport Marketing Quarterly*.
- Greenhalgh, G., P., Simmons, J. M., **Hambrick, M. E.**, Tubbs, T., & Short, K. J. (In review.) *Spectator support: Examining the attributes which differentiate niche from mainstream.* Submitted to *Sport Marketing Quarterly*.
- Hambrick, M. E.**, Greenwell, T. C., & Lasky, S. G. *The dissemination of innovations in the sporting goods industry: A linkages approach.*
- Hambrick, M. E.**, Greenwell, T. C., & Lasky, S. G. *The role of commitment to sports and sports clubs in the diffusion of innovations.*
- Hambrick, M. E.**, Greenhalgh, G. P., & Moorman, A. M. *Sponsorship agreements in a competitive and shrinking marketplace.*

SERVICE

North American Society for Sport Management	
Student Representative	2009 - Present
Member, Conference Committee	2009 - Present
Member	2007 - Present
Sport & Recreation Law Association	
Board of Directors, Student Representative	2008 - 2009
Member	2007 - Present

HONORS AND AWARDS

Recipient of a 2009 Faculty Guest Coach Award from the University of Louisville
Athletic Academic Services and football team

Recipient of a 2009 Red and Black Award for "an instructor or professor whose teaching
and advising have inspired the student to achieve academic excellence"

Recipient of the 2008 Sport & Recreation Law Association Bernard Patrick Maloy
Graduate Student Research Award

Recipient of a University of Louisville Ethnic Minority Assistantship

Recipient of a University of Kentucky Lymon T. Johnson Fellowship

Recipient of a Transylvania University William T. Young Scholarship

ACTIVITIES

Volunteer

- Louisville Ironman, August 2009
- John Carr Benefit Ride: Ride for Awareness - Co-Chair, August 2009
- Jeffersontown HS Hall of Fame Committee, February 2009 - Present
- Louisville Bicycle Club Ride Captain, June 2009 - Present
- Mayor's Memorial Day Hike-and-Bike, May 2009
- Mayor's Ride to Work Day, April 2009
- Jeffersontown HS Auditorium Fundraising Committee, January - December 2008
- National Senior Games: Badminton, Road Race, June 2007
- Kentucky Derby Festival miniMarathon, April 2007

Sport Club Membership

- Member, Louisville Bicycle Club, December 2008 - Present
- Member, Rogue Racing Project, August 2009 - Present