USING STYLE OF PARTICIPATION AMONG TEXAS INSHORE FISHING

GUIDES TO UNDERSTAND DISPLACEMENT BEHAVIOR DUE TO PERCEIVED

SPOTTED SEATROUT (*Cynoscion nebulosus*) POPULATION DECLINES

A Dissertation

by

WILLIAM EARL SMITH

Submitted to the Office of Graduate Studies of
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in partial fulfillment of the requirements for the degree of

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May 2012

Major Subject: Recreation, Park and Tourism Sciences

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ABSTRACT

Using Style of Participation among Texas Inshore Fishing

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Spotted Seatrout (*Cynoscion nebulosus*) Population Declines.

(May 2012)

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Characterization of distinct angler fishing styles (e.g., how, where, and with

what) allows resource managers the ability to predict how perceived impacts or

modifications to fisheries resources (i.e., decline of fish species population) may impact

different user groups. Recreation specialization provides a useful framework for

understanding participation diversity among recreationists in terms of unique styles of

participation. Bryan suggested that within an activity distinct types of participants exist

that demonstrate characteristic styles of participation. Fundamental to Bryan's

development of specialization were contextual attributes that characterize participant

engagement in a recreation activity. However, advancement in specialization has been

accompanied by a departure from Bryan's original conceptualization describing activity

context. I revisited how specialization is operationalized and developed a contextual

style of participation typology and self-classification measure to investigate displacement and substitution behavior among Texas inshore fishing guides.

Data were collected in two separate phases. In 2010, I conducted an exploratory investigation that included eighteen face-to-face, in-depth interviews with key informants spanning the entire coast. In 2011, I conducted a quantitative investigation that included mailing a 12 page self-administered survey to all Texas Parks and Wildlife licensed saltwater fishing guides (n=909). Thematic analysis drawing on grounded theory revealed that the salience of six contextual attributes (i.e., bait type, tackle type, fishing method, casting tactic, water depth, and fish species) that characterized four distinct styles of participation (e.g., Bait, All-purpose, Lure, and Sight-casting Guides). A unidimensional self-classification measure was developed based on my guide typology and discriminant analysis revealed it performed as well as a multidimensional measure of specialization. Ultimately, analysis of variance revealed significant differences existed among self-classification categories with respect to substitution behavior (e.g., targeting alternative species of fish, fishing in another location, and using alternative fishing methods or bait types) due to perceived spotted seatrout declines during 2010. In short, my findings suggest that anglers respond differently due to perceived spotted seatrout declines based on their preferred contextual style of participation. A contextual approach to understanding style of participation provides fisheries managers an effective method for understanding and mitigating social and ecological issues.

DEDICATION

To my wife Brooke, my parents Charles and Earline Smith,

and the best yellow lab in the world Hunter

ACKNOWLEDGEMENTS

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CHAPTER I

INTRODUCTION

In addition to the maintenance of sustainable inshore fisheries resources, managers are also charged with providing satisfying angling opportunities to their constituents. Fundamental to the provision of these desirable angling opportunities is the ability of fisheries managers to understand the diversity extant among the angling public. An attractive method for understanding diversity among anglers is through the characterization of their preferred fishing styles. Knowledge of angling preferences such as where (i.e., resource setting), with what (i.e., fishing equipment), and how (i.e., fishing techniques) anglers participate provides fisheries managers an understanding of the context of the activity. Armed with this contextual information, fisheries managers may be better equipped to provide opportunities for the types of fishing experiences anglers seek and predict how perceived impacts or modifications to fisheries resources (i.e., decline of fish species population) may impact different fishing styles. One population of anglers is strategically positioned to provide resource managers valuable insight regarding fishing styles and elicit feedback on behavior related to perceived decline in fish populations.

Recreational inshore fishing guides represent a unique population of anglers that generate income, to some degree, by taking other anglers fishing. As many as one-third

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This dissertation follows the style of *Leisure Sciences*.

of saltwater anglers in Texas hire guides to satisfy a variety of desired fishing experiences during a given year (Lietz & Grubbs, 2008). In addition to being economic contributors, guides represent an insightful source of information for resource managers based on their years of experience, fishing acumen, and social standing among anglers as opinion leaders. Additionally, since guides exist to take other anglers fishing, it is reasonable to assume that angler fishing styles are representative of the fishing styles exhibited among the saltwater angler population at large. Characterization of diversity among anglers based on their particular fishing style may be an effective method for fisheries agencies to understand and mitigate social and ecological issues.

Researchers have acknowledged that long held assumptions about the existence of an average outdoor recreationist are flawed. Provision of recreation opportunities based on this notion neglects the heterogeneity of recreationists within an activity and the experiences they seek (Bryan, 1977; Hendee, 1974; Shafer, 1969). Shafer (1969, p. 1) illustrated this dilemma in his study of campers and stated that one cannot manage different campgrounds based on aggregate camper data no more than one "…can mate widgeons and wombats". Bryan (1977, p. 175) echoed this sentiment and added that "a major weakness of past research efforts has been the assumption of sportsmen [sic] group homogeneity, with variations among individual sportsmen [sic] remaining largely unexplored". Additionally, Bryan (1979, p. 16) also recognized the difficulty natural resource managers faced when "tailoring policies for diverse groups sportsmen [sic] having different expectations and requirements" apart from the "typical sportsman [sic]".

In order to address these deficiencies, Bryan proposed the concept of recreation

specialization as a method of characterizing diverse recreationists into homogenous groups. Bryan's development of specialization was intended to provide natural resource practitioners a framework for understanding diversity among outdoor recreationists enabling the identification and provision of varied opportunities within a single activity (Scott & Shafer, 2001a). In his seminal study on Western trout anglers, Bryan (1977) employed an inductive investigation approach and identified four types of anglers based on their preferences for setting and techniques as well as participation frequency. He also noted these angler types had distinct preferences for equipment, fish species, and resource setting among others. His study identified angler characteristics that were fundamental in differentiating the contexts in which groups of anglers engage in the recreation activity. To that end, Bryan (1977, p. 175) conceived specialization as "continuum of behavior from the general to the particular reflected by equipment and skills used in the sport and activity setting preferences". Based on the concept of leisure social worlds, Bryan (1977) suggested that within an activity distinct types of participants exist that demonstrate characteristic styles of participation. Scott and Godbey (1994, p. 276) would later define style of participation (SOP) as "a mix of orientations and behaviors that characterize a person's involvement in a given activity". Bryan noticed, through participant observation, it was along these different styles of participation that social norms, ideologies, and angler conflict often developed.

Bryan (1979, p. 88) posited that specialization was likely applicable to all recreation activities stating that "from the standpoint of theory it is important to remember that the specialization dimension likely underlies any recreational activity".

Over the past 35 years recreation researchers have followed Bryan's lead and applied his ideas on specialization to a wide range of leisure activities to understand participant diversity. Specialization has since been distilled, re-conceptualized, and used in a variety of recreation activities and scenarios to understand diversity within an activity. However, specialization has been typically applied to general populations within an activity and no research, to my knowledge, has sought to assess its applicability exclusively among a highly specialized population within an activity.

Problem Statement

Researchers generally agree that specialization is multi-dimensional and comprised of behavior (i.e., amount of experience), skill and knowledge (i.e., skill assessment and desire to learn), and commitment (i.e., importance of activity relative to a participant's life) (Scott et al., 2005; Scott & Shafer, 2001a). Recent studies have adopted these dimensions in order to characterize specialization (see Lee & Scott, 2006; Needham et al., 2009; Oh & Ditton, 2008; Scott et al., 2005). Although, this multi-dimensional framework has proven useful across general populations of participants in various activities, no research to my knowledge has assessed the applicability of this approach with a population that might appear "highly specialized" such as guides.

Guides constitute a group of recreational inshore anglers that may be viewed as highly specialized from an outsider's perspective. For example, inshore fishing guides tend to be highly experienced, possess extensive skill and knowledge, and are extremely committed to the activity of fishing. Contemporary multidimensional measures would likely consolidate these participants into a single, homogenous, "highly specialized"

group. However, this homogenous characterization would be an oversight since diversity is evident among this population based on their very distinct styles of participation.

Additionally, advancement in our understanding of specialization has been accompanied by a departure from the criteria Bryan (1977) developed to describe the activity context. In an attempt to develop universal measures and generalizable typologies that can be applied across various leisure activities, researchers may undervalue the importance of context in characterizing how participants actually engage an activity. The wholesale adoption of generalizable measures may not be applicable to all types of participants and such an approach may be unable to reveal heterogeneity among certain populations. I suggest that understanding specialization in terms of activity context provides resource managers, in particular, with an approach that transcends the aforementioned issues and characterizes participants in a more managerially accessible manner.

Fundamental to Bryan's development of specialization were activity-specific characteristics that described activity context and differentiated participants based on what (e.g., equipment), where (e.g., setting preference), and how (e.g., skill of participant) participants engage in a recreation activity. Activity-specific elements of the angling experience are attributes unique to an angler's SOP such as preferences for angling method, setting, fish species, size of fish, and catch orientation (Arlinghaus, 2006; Fisher, 1997; Graefe, 1980). Research has indicated that fisheries managers have control over activity-specific elements of the angling experience and can implement strategies to accommodate these experience preferences (Fisher, 1997). The inability to

incorporate contextual elements may essentially reduce the specialization construct to a measure of involvement. Additionally, understanding specialization without contextual insight is poorly suited to assist managers in understanding their constituency or providing the varied experiences they seek.

Specialization has been useful in characterizing diversity among traditional participants within the same activity. However, I would argue that understanding specialization in terms of contextual styles of participation provides a more discerning approach for understanding diversity among highly specialized participants within an activity. This approach also provides resource managers insight regarding users based on elements of the fishing experience they can modify for provision of diverse fishing opportunities.

<div align="center">Theoretical Perspective</div>

Specialization seeks to understand the variation in the meanings participants ascribe to an activity. Symbolic interactionism provides a useful perspective for understanding behavior as a result of the meaning participants ascribe to the activity. In developing the theoretical foundation for the specialization construct, Bryan (1977) recognized the need for understanding the meaning of an activity to the participant. Bryan (1977, p. 176) noted the "…emphasis here is on the exploration of the variation among sportsmen [sic] in terms of an activity's *meaning* to the individual and his [sic] behavior." Researchers have acknowledged the potential for symbolic interactionism to inform recreation research and provide insight on the meanings recreationists ascribe to the activity, experience, social interactions, and settings (Brown, 1988; Colton, 1987;

Moore et al., 2008). Meanings form the basis for action (Colton, 1987). Understanding the range of meanings participants ascribe to objects (i.e., people, places, and things) within a particular social world (i.e., actors, practices, organizations, or events that coalesce into a common social interest) is imperative for understanding the importance of these objects within a social world.

Symbolic interactionism posits that behavior is based on the interpretation of social and non-social objects, or "symbols", based on the meanings ascribed to these objects by individuals during social interaction (Blumer, 1969; Charon, 2010; Mead, 1934). The theory originated from the work of George Mead and was developed more fully by his student Herbert Blumer. Blumer (1969) suggested that symbolic interactionism is guided by three major premises: 1) people act toward objects (i.e., anything that is designated, pointed to, or referred to) based on the meanings they ascribe to those objects, 2) the meaning ascribed to those objects is created out of social interaction with others, and 3) meanings are situationally dynamic and are developed during interaction with those objects. Objects may be grouped into several categories such as: physical objects (e.g., boat, red drum or flyrod), people (e.g., angler, game warden, or fishing guide), and ideologies (e.g., concept of ethical fishing, purism, or catch and release fishing). An individual's environment is comprised of only the symbols that he finds important and their meaning is ascribed by the individual and the social world in which he interacts (Blumer, 1969).

Understanding the importance of meaning allows us to determine which social and non-social attributes are the most salient for characterizing participants. This

understanding may facilitate identification of which dimensions, and associated attributes, of specialization are most useful for characterizing SOP. Subsequently, this could lead to the development of measures that accurately capture these meanings.

Purpose of Study

The focus of this study was to understand how the social world of recreational inshore fishing guides can be conceived in terms of distinct SOP. Additionally, this study sought to revisit the manner in which specialization is operationalized and develop a typology to assess and characterize levels of specialization based on styles of participation. My study consisted of an exploratory phase, a measurement phase, and an application phase. Separate research questions and associated objectives guide each phase (Chapters II, III, and IV) of my dissertation. Each chapter contains a unique introduction, literature review, methods, findings, and discussion.

Research Questions and Associated Objectives

1) How is SOP characterized within the social world of Texas inshore fishing guides, and is this approach to specialization relevant for characterizing a highly specialized population?

    a) Characterize the significance of SOP within the social world of inshore guides,

    b) Identify the most salient attributes that contribute to SOP, and

    c) Develop a topology of inshore guides based on SOP.

2) Is the traditional multidimensional approach of characterizing specialization using generalizable measures applicable to a highly specialized population such as fishing guides?

a) Develop a single-item measure of specialization based on contextual SOP and compare its ability for revealing heterogeneity among Texas inshore fishing guides to that of existing generic measures of specialization, and

b) Explore the salience of a contextual dimension (i.e., skill, equipment, and resource setting) compared to commitment and behavior dimensions.

3) Did displacement due to perceived spotted seatrout decline during 2010 influence substitution behavior (i.e., substitution of location, fish species, fishing method, or bait type) variation among inshore fishing guides with respect to contextual SOP?

a) Develop a scale, based on my exploratory analysis, to examine displacement and substitution behavior among inshore guides, and

b) Use my self-classification measure of contextual SOP to detect variation among inshore fishing guides with respect to displacement and substitution behavior.

Importance of Study

Conceptually, this study employed both qualitative and quantitative methods to investigate specialization in terms of SOP within the social world of recreational inshore fishing guides. Researchers have recognized the need for more qualitative research to understand specialization (Scott & Shafer, 2001a) and this investigation represents one of only a handful of studies adopting naturalistic designs (see McFarlane, 1996; Scott & Godbey, 1994). Past studies have indicated that quantitative methods, unlike qualitative, naturalistic designs, may lack the necessary depth to determine if activity types are distinct styles of participation rather than developmental stages (McFarlane, 2001). Additionally, my study represents one of the few studies that has explored SOP as a

means to characterize specialization (see Kerins et al., 2007; Scott & Godbey, 1994). It also represents one of the few attempts to quantify the proportion of participants within an activity that fall within different levels of specialization (See McFarlane, 1994, 1996). Bryan (2001, p. 347) noted that despite all the research conducted on specialization, a fundamental question remains unanswered: "What proportion of the total participants in an activity fall within different categorizations and what are the management implications?" The ability to quantify the proportion of guides within the population based on styles of participation may allow managers to monitor and predict angling trends. The development of measures, and typologies, based on contextually grounded SOP is an attractive approach for fisheries managers. This provides a tool for understanding diversity based on attributes of the recreation experience they can manipulate to provide varied recreational angling opportunities.

Programmatically, inshore fishing guides represent a unique recreation population that has received little attention in past leisure research and no studies, to my knowledge, have addressed specialization of guides within any recreation context. Investigation of this unique population allowed me to explore the applicability of specialization within the social world of guides. Since guides are hired by recreational anglers, their SOP may represent a manifestation of general angler styles of participation and could reflect the range of general angler types. Understanding the range and proportion of guides in various participation styles may provide insight on the demand for various recreation opportunities among recreational anglers.

Understanding the social world of guides has economic importance to the state of

Texas as well. Saltwater fishing in Texas accounts for nearly $1.8 billion annually in total economic output, with over 1.1 million anglers purchasing fishing license annually (Allen & Southwick, 2006). Among these anglers, Texas has, on average, approximately 1000 licensed recreational saltwater fishing guides (TPWD, 2011c) that "…for compensation, accompanies, assists, or transports any person engaged in fishing in the waters of the state" (TPWD, 2011a). Over 650,000 anglers participate in saltwater fishing each year in Texas and one-quarter of those participants, as high as one-third in some bays (Lietz & Grubbs, 2008), report hiring a guide in a given year (Tseng et al., 2006). Understanding trends in overall numbers of guides and styles of participation allows managers to monitor the health and viability of this industry.

My research adds to the understanding of specialization in terms of styles of participation and may encourage development of context specific measures in other recreation activities which reflect the original spirit of the specialization construct conceived by Bryan (1977).

CHAPTER II

CHARACTERIZING SPECIALIZATION USING STYLE OF PARTICIPATION IN

THE SOCIAL WORLD OF TEXAS RECREATIONAL INSHORE FISHING GUIDES

In addition to sustaining the biological and ecological health of fisheries resources, a primary obligation of recreational fisheries managers is the provision of angling opportunities to a broad range of participants (Fisher, 1997). In order to provide the recreational fishing opportunities anglers seek, managers must be able to identify the types of anglers they serve and the preferred context of their participation (Fedler & Ditton, 1986). Over 35 years ago, Bryan (1977) recognized the challenges natural resource managers faced when tailoring resource management for diverse subgroups of recreationists with different recreational requirements and desires. To that end, he developed the specialization framework for understanding diversity among outdoor recreationists within the same activity.

Fundamental to Bryan's (1977) development of the specialization framework were characteristics that described the recreation context for an activity. This facilitated differentiation of anglers based on *how* (i.e., the skill of participant, technique preference), with *what* (i.e., equipment preference), and *where* (i.e., setting preference) participants engage in a recreation activity. Bryan's conceptualization emerged from the social world of recreational trout anglers and was grounded in his observations of their expert use of techniques, sophisticated equipment, and adaption to setting (Scott & Shafer, 2001a). Bryan (1977, 1979) suggested that characteristic styles of participation

exist among trout anglers and developed a typology to describe these "ideal types".

Bryan considered these "ideal types" developmental stages lying along a continuum

through which participants would progress over an angling career. However,

specialization research suggests that progression is more likely an exception rather than

a common occurrence (Kuentzel & Heberlein, 2006). Additionally, researchers have also

suggested that styles of participation may represent different trajectories and associated

subworlds within a larger social world of participants and not necessarily developmental

phases (Kuentzel, 2001; Scott & Shafer, 2001b). In fact, research suggests some

individuals will choose to focus on a particular style of participation (i.e., behavior that

characterizes a participant's involvement in an activity) at the exclusion of other modes

of engagement within the same activities (Kuentzel, 2001; Kuentzel & McDonald, 1992;

Scott & Shafer, 2001a). In spite of the evidence related to the progression hypothesis,

characterizing specialization in terms of style of participation (SOP) provides resource

managers a context for understanding how participants engage an activity. This

approach, in turn, enables resource management that is sensitive to the varied

preferences of recreationists.

This study seeks to characterize the various styles of participation within the

social world of Texas recreational inshore fishing guides and investigate the

specialization construct among this particular population. Despite extensive research on

specialization, to the best of my knowledge, no studies have explored specialization

among guides within any recreational activity. This population provides an opportunity

to explore specialization in terms of SOP among a highly specialized population. As

guides, this group would be considered highly specialized exhibiting high levels of experiential behavior, skill and knowledge, and commitment toward the activity. Yet, despite the appearance of homogeneity, inshore fishing guides demonstrate a range of very different styles of participation.

As highly specialized anglers, many guides are revered by the general angler population. Due to their years of experience, on water frequency, technical skill, and fishing acumen, guides are often considered innovators and opinion leaders by recreational anglers. Subsequently, their status among anglers may influence the range and scope of distinct styles of participation among the inshore fishing community. Alternatively, guides also serve the larger angler community and their SOP may likely be a manifestation of the preferred styles of participation among Texas inshore anglers in general. Regardless of cause and effect, guides are integral in development of SOP within the recreational inshore fishing community. Texas has approximately 1000 recreational saltwater fishing guides that provide for-hire services to recreational anglers each year (TPWD, 2011c). Of the 640,000 saltwater anglers that participate each year, over one-quarter hire the services of recreational saltwater fishing guides with the proportion rising to one-third in some bay systems (Lietz & Grubbs, 2008; Tseng et al., 2006). Understanding the preferred SOP exhibited by guides may provide a surrogate assessment of fishing trends within the general angler population.

With this in mind, I investigated the following research questions: 1) How is SOP characterized within the social world of Texas inshore fishing guides, and 2) Is this

approach to specialization relevant for characterizing a highly specialized population? In order to examine these questions, three objectives guided my investigation:

1) Characterize the significance of SOP within the social world of inshore guides,

2) Identify the most salient attributes that contribute to SOP, and

3) Develop a topology of inshore guides based on SOP.

Literature Review

Recreation Specialization

The genesis of the specialization construct is linked to Bryan's (1977) streamside observations of trout anglers in the western United States. As an avid flyfisher, Bryan observed visible differences among trout anglers with respect to orientation and behavior based on the duration and intensity of their angling involvement (Bryan, 2000). Bryan admired the technical acumen exhibited by flyfishers in their application of equipment and technique in response to various steam conditions. Scott and Shafer (2001a, p. 323) revealed, based on personal communication with Bryan (October 24, 2000), that the term specialized "effectively described the technical mastery and commitment displayed by these fly-fishermen [sic]." Bryan (1977) defined specialization as a "continuum of behavior from the general to the particular, reflected by equipment and skills used in the sport, and activity setting preferences" (Bryan, 1977 p. 175). Using these attributes, he developed a typology of trout anglers that consisted of four distinct types: 1) occasional anglers who were new to fishing and participated infrequently, 2) generalists who were established in the sport and used a variety of techniques, 3) technique specialists who used specific techniques exclusively, and 4) technique-setting specialists who were

highly committed with distinct preferences for water type and angling methods (Bryan, 1979). He noted that these angler groups were distinguishable with respect to their preferences for equipment, catch (i.e., size of fish, target fish species, etc.), and resource orientation, management philosophy, angling history, social composition, and vacation patterns. He posited that very committed trout anglers, who use sophisticated equipment and techniques, occupy the high end of the specialization continuum. Alternatively, the low end of the continuum was primarily comprised of anglers who exhibited little commitment and little preference regarding equipment and technique. Bryan's typology reflected the importance of activity context in distinguishing highly specialized groups from one another. For example, Bryan relied heavily on setting and technique preference as principal descriptors for the two most specialized angler types. Since both groups exhibited high levels of behavioral experience, skill, and commitment to angling, activity context was integral for differentiating among advanced specialization types.

For Bryan, specialization represented both a developmental process, by which participants become more committed and involved in the activity over time, and a range of orientations and behaviors reflected in characteristic styles of participation. However, research has indicated that specialization progression is uncommon and most participants do not advance along the continuum over time to become more specialized (Kuentzel, 2001; Kuentzel & Heberlein, 2006, 2008; Scott & Godbey, 1994; Scott & Lee, 2010; Scott & Shafer, 2001a). Some researchers posit that perhaps participants do not appear to progress, in part, because developmental stages in a recreational activity may represent distinct trajectories of participation (Scott & Shafer, 2001b). Kerins et al.

(2007) suggested that previous studies of progression may have misjudged the importance of understanding specialization in terms of distinct styles of participation. They suggested this oversight was due to the assumption that stages are developmentally linked and represent stepping stones to more advanced stages of specialization.

Despite the research attention specialization has garnered, few studies have sought to characterize the SOP within a specific population. Bryan's original postulation of specialization was guided by the premise that "within any given activity, there are distinct classes of participants who exhibit distinct classes of involvement" (Scott & Godbey, 1994, p.276). Scott and Godbey (1994, p. 276) defined SOP as a "mix of orientations and behaviors that characterize a person's involvement within a given activity". Combining specialization and serious leisure in their investigation of the social world of contract bridge, Scott and Godbey reported their informants could be situated in two separate subworlds. They noted each subworld expressed its own culture, social norms, and ideologies. The first subworld was described as "social bridge" by the researchers and included regular social players and occasional players. The second subworld was labeled "serious bridge" and included tournament players and regular duplicate players. Together these two subworlds comprised four unique styles of participation that were not developmental stages, but represented distinct types of bridge participants. Scott and Godbey's (1994) contract bridge study represents one of the only qualitative efforts to develop typologies based on the meaning participants ascribe to different styles of participation.

Kerins et al. (2007) suggested that specialization could be conceived specifically

in terms of styles of participation. They built upon the earlier work of Bryan (1977) and Scott and Godbey (1994), as well as Stebbins' (1992) discourse on casual and serious leisure. To that end, Kerins et al. (2007) developed three generic styles of participation represented in the social world of Ultimate Frisbee. Unlike Scott and Godbey's (1994) study, these generic styles of participation were created *a priori* based on the specialization literature. Each individual SOP represented "ideal types" that included casual participants, active participants, and serious participants. Each participant type was characterized by their level of experiential behavior (e.g., frequency of participation), skill and knowledge (e.g., desire to develop skill and knowledge), and commitment (e.g., membership in activity based organizations) (Kerins et al., 2007). They developed a self-classification measure based on these SOP typologies to measure specialization among ultimate Frisbee participants compared with traditional multi-item, multidimensional measures. Using discriminate analysis, their self-classification performed (i.e., success of multi-item measures predicting responses to their self-classification) well correctly grouping 71% of Ultimate Frisbee players (Kerins et al., 2007). Their findings suggested that a single item measure of specialization based on SOP was as useful as a multidimensional measure for detecting heterogeneity in a population of recreationists. Like Scott and Godbey, Kerins et al. (2007) noted that styles of participation represent different approaches concerning how individuals choose to participate in a given activity and do not necessarily represent stages of progression.

Social Worlds

Integral to the theoretical foundation of the specialization framework is the

importance of leisure social worlds. A social world is "an internally recognizable constellation of actors, organization, events, and practices which have coalesced into a perceived sphere of interest and involvement for participants" (Unruh, 1979 p. 115). Social worlds are sources of orientation, reward, standards of behavior, and identity for participants (Bryan, 1977, 1979). Several authors have addressed the significance of social worlds with respect to understanding specialization (See Ditton et al., 1992; Scott et al., 2005; Scott & Godbey, 1994). Social worlds are integral to the understanding of SOP because they inform the meaning participants ascribe to the various attributes that comprise SOP.

Unruh (1979) developed a general typology of strangers, tourists, regulars, and insiders as a general characterization of participants found within all social worlds. He suggested these four types could be distinguished based on their social understanding of different orientations, experiences, relationships, and commitments of the social world. Additionally, Strauss (Strauss, 1984) stated that social worlds inevitably segment into smaller subworlds based on spatial distinctions, types of objects, technology and skill, ideologies, intersections with other social worlds, and recruitment of new members.

Incorporating the work of Unruh and Strauss, Ditton et al. (1992) re-conceptualized specialization in terms of the concept of leisure social worlds. They posited that specialization could be viewed as a process by which social worlds could be ordered along a continuum from least specialized to most specialized (Ditton et al., 1992). They proposed that distinct subworlds could be identified along the continuum based on orientations, experiences, relationships, and commitment. They developed

eight propositions and suggested that as specialization increased over time: 1) a person becomes more specialized, 2) the value of side bets increases, 3) centrality of activity to one's life increases, 4) acceptance and support of the rules, norms, and procedures increases, 5) importance of equipment and its skillful use increases, 6) resource dependency increases, 7) level of mediated interaction increases (i.e., use of activity-specific media such as magazines, chat rooms, forums for communication among members, and 8) activity specific elements of the experience (e.g., catching fish for eating) decrease in importance compared to non-activity specific elements (e.g., experience of catch a fish). They suggested that as recreationists become more specialized they would experience a greater sense of community, support of rules, norms and procedures, as well as greater centrality to lifestyle.

Scott and Godbey (1994) investigated specialization in terms of social worlds based on previous work by Strauss (1984) and Unruh (1979). They noted that participation in the subworld of social bridge or serious bridge was a matter of preference to pursue one SOP over another. They stated that the preference for either social or serious bridge indicated that styles of participation were not developmental stages but rather choices to participate in a particular social subworld. Additionally, Salz et al. (2001) sought to build upon Ditton et al.'s (1992) re-conceptualization of specialization from a social world perspective. To that end, they developed a specialization index based on Unruh's characteristics of participation that included orientations, experiences, relationships, and commitments. Their findings supported several of Ditton et al.'s propositions regarding predicted behavior as specialization level

increases. For example, they found that as anglers become more specialized they placed more emphasis on non activity-specific elements of the fishing experience, showed greater support for management rules, had increased side bets, and participated more frequently than less specialized anglers. Further studies using Salz et al.'s specialization index (Hawkins et al., 2009; Salz & Loomis, 2005) suggests support for restricted fishing areas might decrease with increasing specialization if they perceive being displaced from their favorite "fishing spots". They posited that highly specialized anglers attitudes toward restricted fishing areas might be negatively influenced by some sport fishing organizations that oppose these areas. They noted this could be due to their high mediated level of communication and resource dependency.

Ultimately, Bryan's development of specialization was contingent on an intimate knowledge of the social world of trout anglers in the Intermountain West. He used an inductive approach based on participant observation and personal interviews to inform his development of specialization and subsequent typology. He argued that in order to accurately identify and characterize the various styles of participation within a social world, the meaning and significance of contributing attributes must be understood. For example, the meaning and significance of attributes like setting preference may hold vastly different significance for anglers as compared to Contract Bridge players or Ultimate Frisbee participants. Additionally, within the social world of anglers, the use of natural bait may be integral to the fishing style of some anglers while others may consider use of this bait type as unacceptable.

With this literature in mind, I sought to characterize the various styles of

participation within the social world of Texas recreational inshore fishing guides and explore specialization among this particular population. My study represents one of the few attempts to understand specialization exclusively in terms of distinct styles of participation. Additionally, my study represents one of the only attempts to examine the social world of guides in any leisure activity. To that end, my investigation of fishing guides provides an opportunity for understanding specialization in terms of distinct styles of participation and its relevance for characterizing highly specialized populations.

Methods

Study Context

The study context for my investigation included the inshore waters (i.e., waters landward from the barrier islands to the mainland) of the state of Texas from Louisiana to the Rio Grande River. The area encompasses over 367 miles of coastline and houses approximately 2.6 million acres of open water bays and estuaries (TWDB, 2011). Although my study site was limited to inshore waters, Texas Parks and Wildlife Department (TPWD) also regulates the offshore waters out to nine nautical miles. The study site consisted of eight major bay systems (i.e., Galveston Bay, Matagorda Bay, San Antonio Bay, Aransas Bay , Corpus Christi Bay , Sabine Lake, Upper Laguna Madre, and Lower Laguna Madre) as well as numerous minor bays (TPWD, 2011b).

Study Informants

All informants were licensed TPWD saltwater fishing guides. TWPD defines a guide as any person who "…for compensation, accompanies, assists, or transports any person engaged in fishing in the waters of the state" (TPWD, 2011a). TPWD requires

that anyone engaged as a saltwater fishing guide in Texas be required to purchase an All-Water Fishing Guide License for $210 (resident – type 610) or $1050 (nonresident – type 710) to legally guide anglers within coastal waters. Additionally, saltwater guides using motorized watercraft are required to possess a valid United States Coast Guard Operator's License in order to be issued a TPWD fishing guide license. Recently, TPWD also added an alternative guide license for individuals who guide using paddlecraft.

Data Collection

To understand how guides characterize SOP within their social world, 18 semi-structured in-depth interviews were conducted to identify contributing factors and associated meaning. A purposive sampling framework was employed to identify, and focus on, information rich cases that would manifest the phenomenon of interest (Kyle & Chick, 2007; Patton, 2002). In-depth interviews attempt to achieve the level of insight participants possess and uncover the meanings associated with participants' action (Gubrium & Holstein, 2001). It is also an effective approach for discerning multiple perspectives on some phenomenon within the same activity and has also been used in grounded theory methodologies to characterize members of some social world (Gubrium & Holstein, 2001). Informant selection was based on my of the inshore fishing guide social world, recommendations by key informants, the guide's geographic location, observed fishing style, and reputation among anglers and guides alike. Furthermore, I used a snowball technique to augment my list of targeted participants. This technique involved asking initial informants to recommend other guides that meet the aforementioned criteria and would likely provide a unique perspective. Bryan (1979, p.

60) used a similar type of purposive sampling framework or what he referred to as "reputational interview selection technique". Bryan's (1979, p. 60) sampling included contacting participants and asking them to recommend other participants who were "reputed to be highly skilled in and committed to the activity".

In-depth interviewing was chosen as appropriate method for data collection due to its ability to provide an emic, or insider's perspective of the social world of guides. The interviews were semi-structured and employed a conversational style. This permitted me to encourage informants to openly express their views while allowing me to manage the direction of their response. Open-ended interview techniques permitted me to capture the perspective of the informant without predetermining that perspective through prior category selection (Patton, 2002). The conversational tone and open-ended approach encouraged the informants to "talk about experiences, feelings, opinions and knowledge" related to the topics covered in each question (Patton, 2002, p. 354). As suggested by Patton (2002, pp. 343-344), an interview guide was developed and steered interviews to ensure the "same basic lines of inquiry" were presented to each informant.

The interviews included 26 questions I created to ascertain how guides characterize the various styles of participation within their social world (APPENDIX A). They were also designed to identify relevant and pressing issues facing coastal fisheries for further investigation. Questions were crafted using wording and terminology familiar to the informant (Patton, 2002). Additionally, two trial interviews were conducted with inshore fishing guides to elicit feedback regarding the types of questions included, relevance of topics covered, appropriateness of question sequence, and overall

impressions. Comments and suggestions were incorporated into a final set of questions used in all 18 interviews. Prior to each informant interview, the purpose of the interview and confidentiality of the information was explained. A consent form outlining the scope of the study and a permission request to digitally record the interview was presented and signed by the informant (APPENDIX B). Interview locations were selected by the informant and I was able to accommodate all place and time requests. This ensured the interview was as convenient and comfortable as possible for each informant.

Following Creswell and Plano Clark (2007) interviews were conducted until data saturation had been reached and additional informant interviews were likely reveal no further insight. Interview length ranged from 50 minutes to over five hours. Ample time was given to each informant to ensure topics were adequately explored to their satisfaction. Additionally, a journal was kept to record notes regarding the interview topics and overall process. Following Merriam (1998), the journal was referenced between interviews to evaluate the interview process. Interviews were conducted between March and October of 2010. Potential participants were contacted via phone and asked to participate in this research study roughly following a scripted solicitation guide (APPENDIX C). All individuals contacted agreed to be interviewed for this study. Participants ranged in age from mid 30s to mid 60s and all were male. Informant guide experience ranged from 10 to 40 years ($M = 21.2$) with each spending between 100 to 300 days ($M = 206$) each year guiding, scouting, and fishing for personal leisure on Texas coastal waters. Each digitally recorded interview was transcribed into a text document and then original audio and text file were compared for accuracy.

Data Analysis

Data were analyzed using *Atlas.ti* qualitative research software (version 6.1.17). Thematic analysis drawing on grounded theory processes was used to characterize SOP among the social world of inshore fishing guides and to develop a general typology of guides (Charmaz, 2010). This process involved the use of a set of categories or themes that were "systematically interrelated through statements of relationship" to form a framework that explained a particular phenomenon (Patton, 2002, p. 487). Grounded theory was selected as the data analysis method because it provided general principles and guidelines for collecting and analyzing data rather than formulaic rules (Charmaz, 2010, p. 2). Although the ultimate outcome of this process was the construction of theory grounded within the data, my employment of this process was the development of a subworld attribute models that characterizes SOP.

Following Charmaz (2010), themes and concepts were employed to identify meanings ascribed to attributes by informants. These themes were then used to segment styles of participation within their social world. Analysis involved open coding, familial designation, focused coding, memo writing, attribute models and typology development, and finally manuscript development (Charmaz, 2010, pp. 42-95). The first step in the analysis involved open coding or categorization of data segments with a short name that described and summarized each piece of data. This ensured that codes stayed close to the data. Line-by-line analysis of each transcript was conducted and each piece of data was initially coded with a descriptive provisional name. Additionally, in vivo codes (i.e., using special terms or concepts particular to the guide's social world) were also used

where appropriate. In vivo codes were particularly important for capturing the significance and meaning guides ascribe to particular words or concepts within their social world. Second, initially coded names were subsequently designated to a particular familial category to allow greater ease when grouping data during subsequent steps. Third, focused coding was used to sift and consolidate the large amount of data contained in initial codes into synthesized macro themes. Fourth, macro themes facilitated memo writing that occurred throughout the analytical process. Early memo writing entailed exploration of codes to focus later analytical steps whereas advanced codes were used to cluster, compare, and chart categorical evolution and change. This allowed me to make comparisons between people, data, categories, and concepts. From these analytical steps a model of attributes that characterize SOP emerged and formed the basis of manuscript development.

<div align="center">Findings</div>

I developed a model for each research objective to provide a roadmap for my findings. Figure 1 identifies attributes that contribute to the characterization of SOP among inshore guides. Figure 2 depicts the most salient attributes that contribute to informants' SOP. Last, Figure 3 depicts a typology of inshore guides based on SOP.

Characterization of Style of Participation within the Social World of Inshore Guides

Although the social world of inshore guides may appear to be a single, homogeneous entity, informants described multiple subworlds within this social world that expressed unique cultures with associated social norms and ideologies. Based on my analysis, and following Strauss, these subworlds have coalesced around a range of

attributes that fall into four major categories represented by dashed ovals (Figure 1).

These categories include (clockwise beginning in upper left) technologies (e.g., bait

type, tackle type, fishing method, casting tactic, and watercraft type), objects (e.g., fish

species and guide clientele), spatial dimensions (e.g., water depth and geographic

location) and ideologies (e.g., inculcation of values, motivation for guiding, role of a

guide, and belief of authenticity).
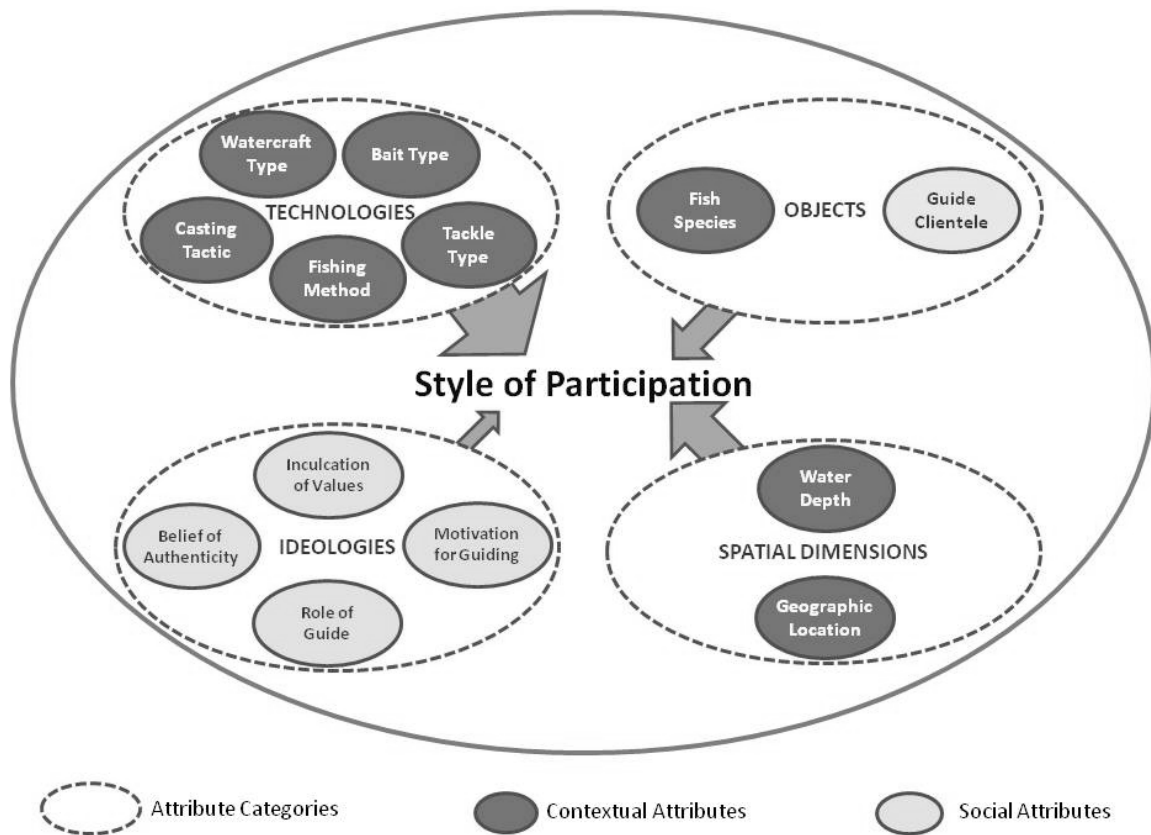
Figure 1. Attributes that Contribute to SOP among Inshore Fishing Guides

Dashed ovals represent four categories of attributes that contribute to SOP within the social world of guides. Dark ovals represent primary attributes that contribute to SOP characterization. Light colored ovals represent secondary attributes that contribute to a lesser degree. Arrow size for each category is indicative of the relative overall contribution of a category to SOP.

While subworlds may exist around many of these attributes individually, I was only concerned with the combination of attributes that comprise the SOP subworld. Attribute categories that contributed more to characterization of SOP are denoted by larger arrow sizes. For example, technology (upper left) and spatial dimension (lower right) categories provided a greater contribution than the other two attribute categories.

Two types of attributes, contextual and social, emerged from my analysis and were responsible for SOP characterization among informants to varying degrees. Contextual attributes, represented by dark ovals, were comprised of activity-specific attributes that described the activity context (e.g., where, with what, and how) of a particular SOP. Social attributes, represented by light gray ovals, consisted largely of social elements such as motivations, values, and beliefs of authenticity. Not all attributes contributed equally to the characterization of SOP. Informants ascribed specific meanings toward these attributes and embraced the most salient ones to collectively describe guide SOP.

The most salient attributes identified by informants to characterize SOP were contextual. Contextual attributes were identified as the primary contributors to SOP based on the strong meaning ascribed by informants to these attributes. Each informant relied on a particular attribute, or set of attributes, to describe individual styles of participation. For example, Captain Neil (pseudonyms were created for all informants to protect confidentiality) used bait type and fishing method to characterize his personal SOP:

I am a hardware [artificial lure] fisherman all the way. I throw top waters a lot. I throw jigs a lot. I wade-fish a lot but I don't have a preference of wading over boat fishing… I don't have a live well on board, if you buy bait you better put it on ice [and] we'll take it to the house and eat it later because I don't use it at all.

Captain Neil's reliance on bait type and fishing method to describe his SOP revealed the importance and meaning he ascribed to these contextual attributes. In all, eight contextual attributes (i.e., bait type, tackle type, fishing method, casting tactic, watercraft type, fish species, water depth, and geographic location) framed how guides fish, what they fish with, what they fish for, and where they prefer to fish.

Although SOP was primarily characterized using contextual attributes, informants did acknowledge social attributes as secondary contributors to SOP. Social attributes were considered secondary contributors because, unlike primary contributors, they were infrequently identified and unique to a limited number of informants. Social attributes all related to perceptions regarding the social norms of being a "guide". These attributes belonged chiefly to the ideology category (lower left in Figure 1) and included: inculcation of values (i.e., adherence to etiquette and ethical behavior towards the resource and other guides), motivation for guiding (i.e., extrinsic and intrinsic rewards such as financial gain, desirable lifestyle, admiration of others, personal satisfaction, challenge of guiding, and a love for the activity and resource), role of guide (e.g., entertainer, role model, teacher, and conservationist), belief of authenticity (i.e., career commitment, exclusive usage of a particular bait type, guiding versatility, and allegiance to a preferred or exalted attribute), and client type (i.e., adaptation to client skill level

and desired outcomes of fishing trip). Perceptions of social norms also varied among informants based the meaning ascribed to these social attributes.

SOP represented the amalgamation of attributes that informants identified as contributors to guide characterization. Although informants identified common attributes that contributed to SOP, the meaning ascribed to these attributes varied and formed the foundation for characterization of their social world. The significance of contextual attributes in characterizing SOP was grounded in the meaning informants ascribed to these attributes. My analysis suggested the social construction of attribute meaning was a dynamic *in situ* process that evolved over time and routinely occurred during the process of guiding.

Attributes Comprising Style of Participation

Building on Figure 1, Figure 2 focuses exclusively on the primary (contextual) attributes identified by informants to characterize SOP. My analyses revealed that of the eight contextual attributes identified by informants, only six were essential for understanding SOP among inshore guides (Figure 2). *Bait type, tackle type, fishing method, casting tactic, water depth,* and *fish species* emerged as the most salient contextual attributes that characterized fishing styles. The six contextual attributes were arranged in no particular order. Collectively, these six attributes defined a guide's particular SOP and each attribute reflected the possession of specific skills and knowledge necessary to engage in a particular fishing style. The saliency of an attribute or set of attributes, defined distinct styles of participation. Two contextual attributes, *watercraft type* and *geographic location*, were excluded as primary contextual attributes

contributing to SOP. The importance of watercraft was tied to its ability to facilitate

access to a particular setting or a particular fishing method. Since these attributes were

already represented, *watercraft type* was excluded. *Geographic location* was used to

contrast guides based on coastal regions (i.e., upper coast from lower coast).
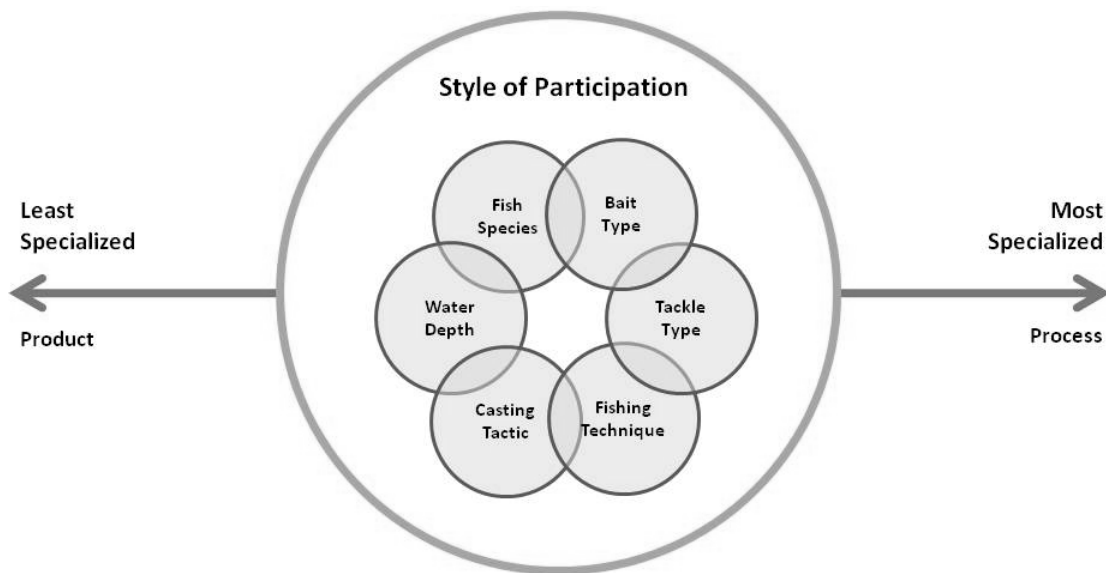
Figure 2. Attributes Composing SOP

Building on Figure 1, Figure 2 represents the most important primary attributes that contribute to SOP.
The six contextual attributes are arranged in no particular. The saliency of an attribute, or set of attributes,
defines distinct styles of participation. Using SOP, guides can be placed on a continuum from least
specialized guide, focused on product, to most specialized guide, focused on process.

This attribute functioned as an opportunity constraint to engage in particular styles of

participation and was subsequently excluded as an essential attribute. For example, water

clarity and geomorphology may limit opportunities for guides to engage in a traditional

sight-casting (i.e., visually spotting fish in the water and casting) fishing style along the

upper Texas coast.

Bait type was the most identified attribute contributing to SOP and included natural bait, artificial lures, and flies. Natural bait was identified as the most effective *bait type* and required the least amount of skill to use. Conversely, informants acknowledged use of flies required the most skill to successfully catch fish. Captain Towns, a self-described sight-casting guide for over 15 years, used *bait type* as the sole descriptor in his classification of inshore guides: "I would say there's the bait-only guide, the bait and lure guide, the lure guide, and then the fly guide." His use of bait as the primary contextual contributor to SOP was common among all informants and reflected an increasing level of skill associated with *bait type*. Monikers associated with bait type were often used as a badge of honor or term of contempt. For example, the exclusive use of lures was admired among several informants who referred to these guides as "purists". Informants used the term "purist" to suggest that anglers who used lures exclusively represented an authentic approach to fishing. On the other hand terms such as "croaker soakers" were used by some informants to describe guides that use live finfish such as Atlantic croaker (*Micropogonias undulatus*). This was a derogatory term used to describe a less skilled method for catching fish.

Tackle type referred to a general category of rod and reel combination used while fishing. *Tackle type* typically included: spinning, casting, light tackle, and flyrod. Informants that relied on conventional tackle (i.e., typically used spinning and casting tackle) did not readily identify with *tackle type* and ascribed little meaning to its use. However, informants that used specialized tackle such as light tackle (i.e., lightweight rods and spinning reels) and fly tackle were often likely to adopt *tackle type* as a main

descriptor. Captain Clays, a flyfishing guide with 15 years experience, stated "[I'm a] artificial, light tackle guide, fly guide and really that's it. That's all I do, and I refer a lot of trips to some other guides because I won't throw popping corks [i.e., using natural bait with strike indicators]." Therefore, *tackle type* was an important attribute in differentiating specialization levels. Advanced tackle users identified more readily with *tackle type* and were less likely to make concessions regarding adoption of other tackle types.

Fishing method was defined as the manner in which a guide approached and engaged the fish and fishing situation. *Fishing method*, typically included passive and active techniques such as fishing: from a fixed shore-based location, from an anchored watercraft, while drifting from a watercraft, while using a trolling motor on a watercraft, while paddling a personal watercraft (e.g., kayak), while wading (i.e., slowly walking along in shallow areas while fan casting), and while poling from a technical skiff (i.e., using of a 12-20 foot lightweight pole to silently push a watercraft through shallow water). Informant characterizations of *fishing method* suggested active fishing techniques required more skill or greater physical exertion than passive techniques. Informants also praised the adoption and exclusive use of particular techniques, like wading, that were frequently admired. Captain Hone, a lure guide with 30 years of guiding experience, praised guides that waded with artificials [lures] as "hardcore guides" underscoring his admiration for this *fishing method*.

Casting tactics included blind-casting and sight-casting. Blind-casting was the most common tactic and involved casting into an area in the hope that a fish is present.

Typically, sight-casting referred to the act of patiently scanning shallow water and only

casting to a fish once it has been visually spotted. However, several informants also

described sight-casting as not only casting to visible fish, but also casting to other

objects such as: structure (e.g., oyster reef, abandoned crab traps, etc.), substrate (e.g.,

sand, mud, or grass patches in shallow water), disturbed water (e.g., bait fish, fish

swirls), and slicks (i.e., floating oily patch created when gorged feeding trout regurgitate

bait fish to relieve their stomach). Captain Ellis, a 30 year lure guide, described the

exhilarating challenge associated with sight-casting tactics: "It's the greatest thing there

is, to be able to get on a good, clear-water flat, stand up on a platform, and be able to

sight cast - Yeah. It's the ultimate challenge…It doesn't get much better than that."

Informants also identified *water depth* as an important contributor to SOP due to

its ability to facilitate or constrain the appropriate or successful use of bait type, tackle

type, and fishing method. Fishing activities in deeper water (i.e., typically greater than

four feet) were considered much less specialized than those in shallow water (i.e., less

than four feet). Similar to other attributes, fishing in remarkable water depths such as

very shallow water, reflected an advanced level of skill to successfully engage a fish.

Shallow water played a much larger role in characterizing fishing styles than deeper

water. My analysis revealed that as *water depth* decreased the meaning ascribed to this

attribute became more salient for particular informants.

Fish species referred to the type of fish typically caught or targeted. Above all

others, two species were commonly used by most informants to directly characterize

SOP among guides: spotted sea trout (*Cynoscion nebulosus*) and red drum (*Sciaenops*

ocellatus). In fact, several informants described themselves and other guides as "trout guides" or "trophy trout guides" which reflected a consumptive or sport related motivation. As Captain Clays, a sight-casting guide with 15 years experience noted:

> I love to go after big trout. I mean, that's my deal. But as you know, we don't --
> we throw at a lot more than we catch. So, I would have to say trout is really a
> big goal; primary goal for me to try to catch big trout.

Although he doesn't directly identify himself as a "trout guide", he acknowledged the pursuit of big SST as a "really big, primary goal". This reflected the importance of SST to his preferred fishing style. However, informants could not be placed on a specialization continuum based exclusively on fish species. Since nearly all inshore guides targeted SST and red drum, classification of the specialization level of guides based on fish species was only possible in light of their preferences for other contextual attributes. For example, sight-casting to SST in very shallow water using fly tackle would be considered more specialized that using natural bait to catch SST on an oyster reef.

Based on SOP, guides were placed on a continuum from least to most specialized (Figure 2). Guides exhibiting the most specialized SOP were characterized by process related motivations such as the means by which fish were caught or pursued. Generally, guides exhibiting a less specialized SOP were driven by product motivations such as fish retention. These corresponding motivations reflect Ditton et al.'s (1992) subworld perspective of specialization which suggested that less specialized subworlds seek immediate, extrinsic rewards whereas more specialized subworlds seek more intrinsic

rewards. Informants ascribed a range of meanings to each contextual attribute. Some

attributes were more salient than others for guides and the resulting combination, and

associated interactions, of these attributes defined a guide's SOP.

Typology of Inshore Fishing Guides using Contextual Style of Participation

Figure 3 builds on Figure 2 and describes four general types of inshore fishing

guides, positions these guide types along a specialization continuum, and identifies each

type's most salient contextual attributes. Based on my analysis, four primary styles of

participation emerged and were be placed along a continuum from the least specialized

guide type to the most specialized, consisting of (from left to right): *Bait Guides, All-*

purpose Guides, Lure Guides, and *Sight-casting Guides* (Figure 3). The importance

informants ascribed to each contextual attribute varied between guide types. This

importance is represented by the vertical position attribute bubbles. The higher the

bubble the more salient the attribute was in characterizing SOP. Multiple attributes in a

single bubble indicates similar importance was placed among each attribute. The

importance of individual attributes, or set of attributes, defines each guide type.

Bait Guides represented the least specialized guide type (far left in Figure 3).

They were characterized primarily by their use of natural bait. This attribute was the

defining attribute underlying their SOP. Fishing method, casting tactic, tackle type, and

fish species were not as important for characterization of this group. *Bait Guides* often

employed the most effective and elementary techniques and tactics to produce a catch.
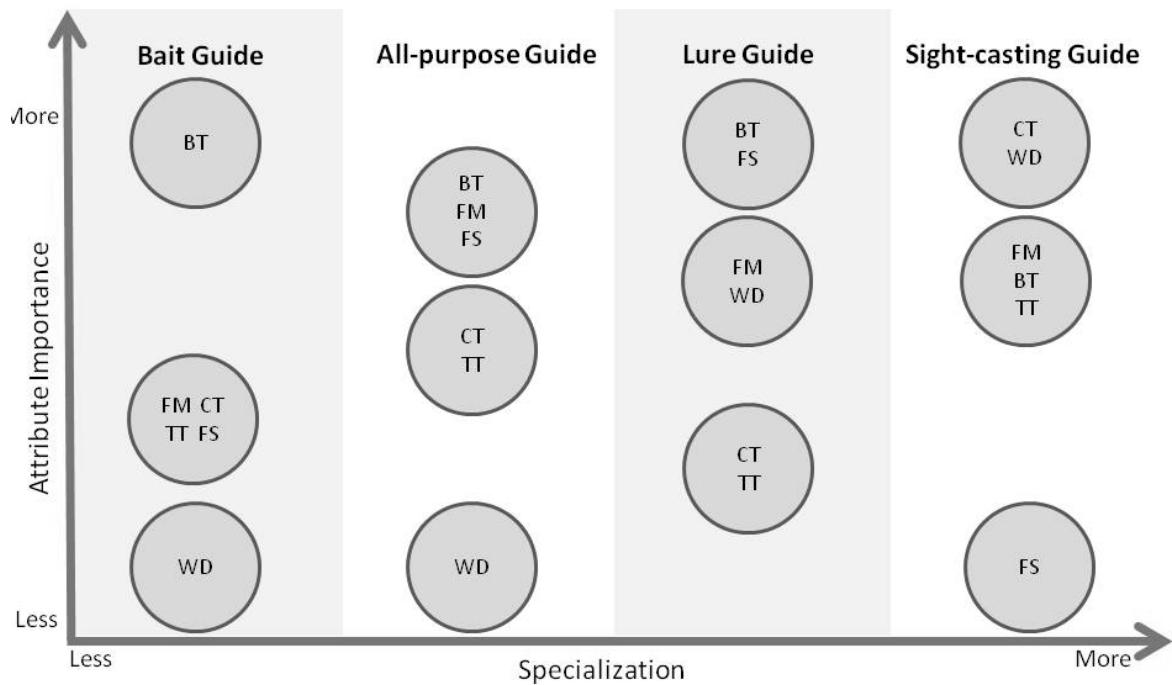
BT = Bait Type, TT = Tackle Type, FM = Fishing Method, CT = Casting Tactic, FS = Fish Species and WD = Water Depth

Figure 3. Specialization Typology and the Importance of Attributes to Each Guide Type

Building on Figure 2, Figure 3 depicts four types of inshore fishing guides based on SOP and the importance of the six individual contextual attributes that comprise SOP. The guide types, ordered from left to right represent increasing specialization level and include: Bait Guides, All-purpose Guides, Lure Guides, and Sight-casting Guides. The importance of each attribute in contributing to a guide type's SOP is indicated by its vertical position. Attributes located higher are more important whereas those positioned lower are less important.

Although they often fished in deeper water (i.e., greater that four feet), water depth was the least important attribute that defined this group. They typically fished from an anchored boat, while blind-casting with spinning tackle for several species of fish. They often guided less experienced and less skilled anglers. Bait Guides often seek to facilitate catching and keeping a limit of any game fish for their clients (e.g., typically seatrout, red drum, flounder, and black drum) while providing a generally entertaining

angling experience. They tended to be very product focused and often measured the success of their trip by their ability to produce a catch for their clients. Informants speculated that *Bait Guides* comprised the largest segment of Texas inshore fishing guides.

All-purpose Guides (2nd from left in Figure 3) represented the most versatile guide type. This group was characterized by their adaptable use of bait type and fishing method to target certain fish species (e.g., SST and red drum). These three attributes in combination define this group. They used both natural and artificial bait to accommodate a range of clients, resource conditions, and fishing situations. They often fished from a drifting boat, fished while using a trolling motor on a watercraft, or wade-fished. Although they typically blind-casted using both spinning and casting tackle in various water depths, these three attributes (i.e., casting tactic, tackle type, and water depth) were of less importance in defining this group. They typically served beginner, intermediate, and advanced anglers. Consequently, their fishing style might vary from day-to-day based on client skill, preference, weather, and other mitigating factors. For example, *All-purpose Guides* might anchor on an oyster reef with beginners and fish with live croaker one day and then take a group of accomplished anglers wade fishing with lures the next day. They provided the broadest range of angling opportunities and acknowledged doing "whatever it takes" to please their clients and accommodate their preferences. Informants speculated that *All-purpose Guides* were the second largest segment of guides along the Texas Gulf coast. While not as product-focused as *Bait Guides*, this group often sought to produce limits of fish for their clients as well.

Lure Guides (2nd from right in Figure 3) represented a more specialized guide type than *Bait* or *All-purpose Guides.* Bait type and fish species were the most salient attributes that defined this group above all others. *Lure Guides* used artificial lures to target large or "trophy" SST and occasionally red drum. Their preferred fishing method was wading in shallow water (i.e., less than four feet) although they might fish from a drifting boat or use a trolling motor occasionally. They typically used casting or spinning tackle to blind and sight-cast to fish in shallow water. However, tackle type and casting tactic were the least important contextual attributes. Unlike, *Bait Guides* and *All-purpose Guides* who often sought a bag limit, *Lure Guides* frequently practiced selective harvest (i.e., keeping smaller slot sized fish SST and releasing larger SST) or reduced catch. *Lure Guides* typically served intermediate and advanced anglers that possessed greater skill and experience than the average angler. They were much more process motivated and often assumed the role of teacher and fishing companion for their customers.

Sight-casting Guides (far right in Figure 3) represented the most specialized guide type and resource dependent group. The primary defining attributes for this group were casting tactic, fishing technique, and water depth. They almost exclusively practiced sight-casting to fish in very shallow water using fly or light tackle. *Sight-casting Guides* often targeted red drum due to the species' affinity for shallow water but also sight-casted to SST, black drum, southern flounder (*Paralichthys lethostigma*), and sheepshead (*Archosargus probatocephalus*). Since sight-casting was a defining attribute, guides typically waded or poled a skiff through extremely shallow water to stalk fish. Additionally, *Sight-casting Guides* often practiced catch and release fishing and were

highly technique and resource setting dependent. They typically served intermediate to advanced anglers and frequently assumed the role of coach, teammate, and companion for their clients. Informants speculated that *Sight-casting Guides* represented the smallest segment among Texas inshore fishing guides.

Each guide type represented a particular subworld with its own social norms, attitudes, perceptions, motivations, and preferences. As informants become more deeply immersed within the social world characterized by each SOP, the meanings ascribed to the attributes defining the specific SOP become increasingly important. Since social attributes were identified as secondary contributors based on my analysis, characterization of SOP among guides and my typology of guides relied exclusively on contextual attributes. This typology was not intended to reflect the SOP for every inshore guide but instead represented ideal types. Although some informants acknowledged their own advancement along this continuum from less specialized to more specialized, these styles of participation do not necessarily represent developmental stages through which informant's progress. Rather, they reflected distinct modes of activity engagement within the broader social world of guides.

Discussion

The purpose of this exploratory study based, on Bryan's (1977) specialization framework, was twofold. First, I wanted to understand how Texas inshore fishing guides characterized SOP within their social world. Second, I wanted to determine if this approach to specialization was useful for exploring heterogeneity among this highly specialized population. Similar to Bryan's original characterization of anglers, my

analysis of inshore fishing guides revealed they distinguished themselves based on their skill and knowledge about the activity, equipment preferences, and resource orientations. Among inshore fishing guides, SOP was predominately defined using attributes to describe the context of the activity. To that end, four types of inshore fishing guides emerged from my analysis that were segmented based solely on their preferences for contextual attributes. My unidimensional contextual approach based on SOP reflects a departure from traditional multidimensional approaches for characterizing specialization. However, this characterization appears to be a more functional and discernible method for discriminating populations that exhibit high levels of behavioral experience, skill and knowledge, and commitment such as guides. Additionally, this contextual perspective provides natural resource agencies a tool for managing fisheries resources that is anchored the context of the activity over which they have direct control.

My findings support past work highlighting the fundamental role of social worlds in the characterization of specialization. My findings also illustrate that guides are members of multiple subworlds that revolve around technologies, objects, spatial dimensions, and ideologies (Ditton et al., 1992; Strauss, 1978, 1984). This study also reinforces the contribution of social world dynamics, identified in previous studies (See Bryan, 1977; Ditton et al., 1992; Kerins et al., 2007; Scott & Godbey, 1994), for the development of specialization in general and styles of participation in particular. Specifically, social worlds and associated subworlds foster the creation of attribute meaning among members via social interaction that facilitates the development of unique styles of participation. Attribute meaning ultimately influences the exhibition of

SOP.

Unlike previous studies (See Kerins et al., 2007; Scott & Godbey, 1994) that have used multidimensional approaches (i.e., behavioral experience, desire to develop or self-reported skill and knowledge, and commitment) for characterizing SOP, my approach differed in a fundamental way. I characterized SOP using a unidimensional, contextual approach that was grounded in context of the activity (i.e., when, where, what, and how). Characterization of SOP using behavioral experience, desire to gain skill and knowledge, and commitment may be useful for detecting heterogeneity among general populations of recreationists with a broad range of involvement and skill profiles. However, my findings suggest that this approach appears to be of limited value for highly specialized populations such as guides. Guides are unique in that the majority is highly committed to the activity, very knowledgeable, highly skilled (in their particular fishing style), possess many years of experience, and participate frequently. The number of days a guide fishes each year or the importance of guiding to his lifestyle provides little insight on how he engages in the activity, the potential for conflict with other fishing styles, or support of fisheries management strategies. Contextual attributes provide a meaningful approach for characterizing fishing styles based on everyday interaction among guides, and with the fishing resource, where meaning is created. Where guides fish, how they fish, what they fish with, and what they fish for, influence the attributes guides use to characterize and distinguish themselves from one another based on activity context.

The emergence of contextual attributes as the primary descriptors of SOP is

likely a function of the highly specialized nature of the population. This is not to downplay the importance of multidimensional approaches. Rather, these findings highlight the salience of context specific indicators that are firmly grounded in the experience, place, and people who engage in an activity. In the context of my findings, attributes such as frequency of participation, centrality to lifestyle, intensity of involvement, and commitment to the activity were secondary to contextual contributors and, for some informants, ineffective for distinguishing among styles of participation. The incorporation of contextual elements (See Bryan, 1977) or a contextual dimension (See Chipman & Helfrich, 1988) is not a novel approach. However, in an effort to generalize specialization across and within activities, the importance of incorporating activity context in characterizing specialization may have diminished among researchers. I propose a return to the inclusion of contextual attributes for characterizing specialization. The development of contextual indicators for quantitative measurement, however, will require preliminary research to develop an understanding of the activity context to frame research investigations. Undoubtedly, this takes time, effort, and potential financial resources on behalf of the investigator and sponsoring agency. The product of these efforts, however, will be the development of a tool that is sensitive to contextual preferences and the associated experiences desired by participants.

Last, understanding SOP using contextual attributes provides resource managers an understanding of participant diversity based on elements of the fishing experience they can influence. Bryan's (1979; Scott & Shafer, 2001a) original impetus for developing the concept of specialization was to provide recreation resource managers a

framework for identifying and characterizing diversity among recreationists within the same activity. Fisher (1997) noted that fisheries managers have the ability to manipulate contextual elements of a fishing experience using spatial and temporal resource regulations (e.g., bag limits, size limits, tackle and bait usage, zoning, etc.). My characterization of SOP among guides using their preference for contextual attributes speaks directly to attributes identified by Fisher (1997) as managerial desirable. An understanding of fisheries resource issues and perceived impacts through the lens of contextual styles of participation may be particularly useful for resource agencies in proactive management of recreational fisheries. Additionally, since guides serve the larger angler community they may provide a surrogate measure of styles of participation among anglers in general. Potentially, a contextual approach offers resource agencies the ability to quantify the percentage of participants based on particular styles of participation. With this information, resource managers could monitor SOP trends among inshore anglers and ultimately create a range of recreation opportunities that reflect the preferences and needs of their constituency.

Finally, I acknowledge that my sample of inshore guides does not constitute the population of Texas inshore guides. A next step for my research will be to develop instrumentation to capture contextual styles of participation among this population. Additionally, I sought to examine its utility for revealing heterogeneity among this specialized population. Invariably, the omission of the behavioral and commitment dimensions does not suggest these elements do not exist. I simply observed that these dimensions were not primary distinguishing characteristics among the social world of

inshore fishing guides. Past work has demonstrated their relevance among general populations of recreationists. Continued testing among sub-populations will likely reveal different specialization profiles where other dimensions will be critical for identifying heterogeneity and the existence of participation subworlds.

CHAPTER III

USING A STYLE OF PARTICIPATION SELF-CLASSIFICATION MEASURE

TO CHARACTERIZE HIGHLY SPECIALIZED POPULATIONS

Specialization was conceived as a framework to assist natural resource managers in understanding diversity among participants within the same activity (Bryan, 1979). In Bryan's (1977) original conceptualization, he suggested that characteristic styles of participation exist among trout anglers based on his observations of their expert use of techniques, sophisticated equipment, and adaptation to setting (Scott & Shafer, 2001a). Bryan (1977, p. 175) posited these anglers could be placed on a "continuum of behavior from the general to the particular reflected by equipment and skills used in the sport and activity setting preferences." Inherent in Bryan's (1977) concept of specialization was the inclusion of activity-specific elements that were unique to fishing such as preferred fishing method or water type. Activity-specific elements provide a contextual understanding of the angling activity and enable differentiation of participants based on how (e.g., skill of participant), with what (e.g., equipment), and where (e.g., setting preference) they engage in a recreational activity. He suggested that the characterization of specialization in terms of a recreationist's style of participation (SOP) necessitates the inclusion of context specific attributes germane to the activity.

Since Bryan's original conception of specialization, researchers have applied the construct to a wide range of recreational activities based on a variety of behavioral and attitudinal measures. However, the development of generalizable measures to

characterize specialization across and within a range of leisure activities has lead to a departure from the use of indicators that are sensitive to context (e.g., equipment, technique, and resource setting preference) intrinsic to Bryan's (1977) original conceptualization. The use of universal measures that generalize across activities downplays the importance of activity-specific attributes that characterize context. Among nature-based activities, measures that fail to account for activity context can be problematic for two reasons: 1) they fail to capture the heterogeneity of highly specialized populations, and 2) they provide little insight on the recreation experience resulting in information that is of little use to resource managers. Collectively, these two issues diminish the utility of specialization as a management tool for resource agencies by limiting their ability to understand the diversity among their constituents and provide the recreation opportunities they seek. To address these issues, I suggest a need for, and propose a return to, the inclusion of contextual attributes within specialization measures based on recreationists' SOP.

Researchers tend to agree that specialization is comprised of behavior (e.g., amount of experience), skill and knowledge (e.g., skill and knowledge assessment and desire to learn), and commitment (e.g., importance of activity relative to participant's life) (Scott et al., 2005; Scott & Shafer, 2001a). However, operationalization of these dimensions has often resulted in the use of indicators that exclude reference to activity context. I have observed that contemporary specialization measures often feature generic attitudinal indicators that broadly reference aspects of the leisure experience and rely on past behavior and commitment. Researchers' quest for external validity and a desire to

adapt "tried and true" scales has lead them to "bury" context. For example, the following items are frequently used for the measurement of skill, knowledge and equipment, and commitment dimensions respectively: "I feel that I am more skilled in [activity], than other participants in general" (Ditton et al., 2005; Oh & Ditton, 2008), "Given the [activity] knowledge I have developed, it is important I continue to [activity]" (Needham et al., 2007), "I have accumulated a lot of [activity] equipment"(Needham et al., 2009). "I would rather go [activity] than do almost anything else" (Kerins et al., 2007; Lee & Scott, 2006; Sorice et al., 2009). For each of these items, the primary attitude object references an experiential attribute that is not germane to any specific activity type. While it allows researchers to substitute the activity reference to fit a wide range of recreation options, key distinguishing characteristics are lost in the adaptation.

Among a highly specialized population such as fishing guides, existing measures that rely on past behavior and commitment may lack the sensitivity to distinguish among the various styles of guiding. For example, recreational fishing guides tend to be highly experienced, possess extensive skill and knowledge, and are extremely committed to the activity of fishing. Efforts to distinguish this population using indicators such as those referenced above would likely fail, consolidating these participants into a single, homogenous, "highly specialized" group. Viewing this population as homogenous fails to recognize the diversity extant among guides evidenced in their distinct styles of participation. Consequently, the utility of guides' commitment and behavioral experience for distinguishing heterogeneity among this population is limited.

Understanding heterogeneity among a high specialized population such as fishing guides is important for several reasons. First, although a number of researchers have drawn upon specialization to explore leisure behavior within a range of activity types, no studies, to my knowledge, have sought to explore specialization among fishing guides or guides within the context of any leisure activity. Second, guides are often considered experts in their activity, are frequently revered among general activity participants as trend setters, and reflect the broader recreational activity population. Third, although guides represent a unique, highly specialized population in the world of recreational fishing, diversity is evident based on the distinct fishing styles they exhibit (Smith et al., 2012). Following from Bryan (1977), I suggest that omitting reference to activity-specific attributes among indicators used to measure specialization may limit the utility of the construct as a tool for differentiating highly specialized populations.

Additionally, the utility of any tool may also rest in the practical application and subsequent adoption of that that tool among researchers and managers who may use it. Researchers have acknowledged that measurement of individual dimensions of specialization has typically required participants to answer a battery of questions regarding their behavior, skill and knowledge, and commitment (Needham et al., 2009). However, recent studies have suggested several advantages to using a single-item, self-classification measure over a multi-item measure. Researchers have indicated that self-classification measures perform as well as multi-item measures in detecting heterogeneity among participants in the same activity (Kerins et al., 2007; Needham et al., 2009; Scott et al., 2005; Sorice et al., 2009). Moreover, a self-classification measure

reduces response burden on participants, is more easily administered by investigators, and does not require advanced multivariate statistical analyses (Scott et al., 2005). Self-classification measures are also well suited for presenting specialization in terms of SOP as distinct options. Self-classification measures allow respondents to self-select one of several categories that most closely describes their particular SOP. Self-classification measures provide a more parsimonious alternative for participants, researchers, and resource managers.

Consequently, I suggest that there is a need to return to Bryan's original specialization tenets and include reference to activity-specific attributes that characterize activity context. These contextual attributes are fundamental to understanding variation among this population. With this in mind, the purpose of this study was twofold: 1) to develop a single-item measure of specialization based on contextual SOP and investigate its ability to reveal heterogeneity among Texas inshore fishing guides, and 2) explore the salience of a contextual dimension (i.e., skill, equipment, and resource setting) compared to the commitment and behavior dimensions among this population.

<div align="center">Literature Review</div>

Specialization and Styles of Participation

Bryan (1977, 1979) recognized that natural resource agencies must be able to identify heterogeneity among anglers to ensure provision of the varied angling opportunities they seek. To that end he developed the concept of specialization to provide natural resource managers a framework for facilitating the identification and characterization of diversity among recreationists within the same activity (Bryan,

1977). Bryan observed differences among trout anglers in resource orientations and activity-specific preferences based on their duration and intensity of involvement (Bryan, 1977, 1979; Scott & Shafer, 2001a). Subsequently, he defined specialization as "a continuum of behavior from the general to the particular, reflected by equipment and skills used in the sport, and activity setting preferences" (Bryan, 1977, p. 175).

Bryan (1977) characterized specialization as both a developmental process by which participants become more committed and involved in an activity over time, and a range of characteristic styles of participation that could be placed along a specialization continuum. Style of participation is a "mix of orientation and behavior that characterizes a person's involvement within a given activity" (Scott & Godbey, 1994, p. 276). Bryan (1977, 1979) posited that characteristic styles of participation existed among trout anglers and he developed a typology to describe these "ideal types". Bryan based his characterization of anglers on their frequency of participation, fishing technique, and their setting preferences. The typology included: 1) occasional anglers who were new to the sport and fished infrequently, 2) generalists who were established in the sport and used a variety of techniques, 3) technique specialists who employed specific angling techniques (e.g., preference for flyfishing), and 4) technique-setting specialists who were highly committed to the activity with preferences for specific water and angling methods. Bryan suggested these styles of participation were reflected in terms of the anglers' skill, equipment preference, fish and resource setting orientation, management philosophy, angling history, social content, and vacation patterns.

Bryan (1977, 1979) considered these "ideal types" stages along a developmental

continuum that a participant would likely experience as they progressed over an angling career. Scott and Shafer (2001) suggested that Bryan regarded specialization, first and foremost, as a developmental process reflecting a progression in behavior, attitudes, and preferences. They proposed that specialization be conceived as a progression in behavior, skill, and involvement (Scott & Shafer, 2001). However, research suggests that specialization progression is uncommon and most participants do not advance along a continuum over time to become more specialized (Kuentzel, 2001; Kuentzel & Heberlein, 2006, 2008; Scott & Godbey, 1994; Scott & Lee, 2010; Scott & Shafer, 2001a). In fact, progression is more likely an aberration rather than the norm and these developmental stages may represent different styles of participation within the same activity (Kuentzel, 2001; Kuentzel& McDonald, 1992). As Kuentzel (2001, p. 354) noted, "some anglers may indeed progress from worm-fishing to fly-fishing. Nevertheless, it might be possible to specialize in worm-fishing, where the specialist may be able to choose just the right type of worm from the appropriate type of soil for the right type of fish under exacting water quality conditions". Kerins et al. (2007) have also suggested that previous studies of progression have mischaracterized specialization in terms of distinct styles of participation due to the assumption that stages are developmentally linked and serve as stepping stones to more advanced stages of specialization. Perhaps participants do not appear to progress, in part, because developmental stages represent distinct trajectories of participation. The lack of evidence to support progression may be indicative of independent or distinct styles of participation based on angler fishing preferences.

Activity-specific Attributes

Fundamental to Bryan's characterization of styles of participation expressed by trout anglers was his reliance on context specific attributes. Bryan's use of the term "specialized" to describe diversity among trout anglers was grounded in their exhibition and adaptation of skill, technique, and equipment to accommodate various stream conditions (Scott & Shafer, 2001a). Activity-specific attributes are defined as contextual elements unique to the fishing experience (Arlinghaus, 2006; Fisher, 1997) and include aspects such as fish species, size of fish, resource setting preference, technique preference, and equipment preference (Bryan, 1977; Graefe, 1980). Activity-specific attributes are inextricably linked to styles of participation as they describe the context of the angling experience. These contextual attributes characterize where (e.g., resource setting preference), with what (e.g., equipment, bait, and species related preferences) and how (e.g., fishing method preference) anglers participate.

The inclusion of activity-specific elements of the fishing experience to characterize specialization is particularly attractive for resource managers. Research suggests that resource managers have control over activity-specific elements of the angling experience (Fisher, 1997). For example, managers can modify contextual elements through temporal and spatial regulation of particular geographic areas as well as manipulation of size requirements, bag limits, tackle, and bait usage. Manipulation of contextual elements enables resource agencies to provide a wide range of diverse angler opportunities to their constituency. This contextual approach to opportunity provision reflects the diversity in SOP found among the fishing population in general.

Limitations of General Measures

Bryan (1979, p. 88) posited that specialization was likely applicable to all recreation activities stating that "from the standpoint of theory it is important to remember that the specialization dimension likely underlies any recreational activity." Researchers have applied specialization to a wide range of leisure activities to understand participant diversity over the past 35 years. Specialization has since evolved methodologically and conceptually and has been successfully applied to a range of leisure activities to understand within activity diversity (Scott & Shafer, 2001a). The evolution of specialization research has resulted in a shift from the use of measures that feature contextual elements in item wording to more general assessments of activity involvement. The evolution in specialization measurement is likely an artifact of researchers' attempts to develop valid and reliable scales that can be adapted to measure specialization across a range of activities. While there has been some success in this regard, lost is a nuanced understanding of the experience context. I would argue that generic measures provide for a generic understanding of the experience for non-existent generic populations (Shafer, 1969). Ultimately, they prevent characterization of diversity among highly specialized populations and offer less utility for natural resource managers because they fail to recognize critical attributes of the experience under managers' control. Constraints researchers have expressed similar concerns regarding general measures (Mannell & Iwasaki, 2005). There is general understanding that factors inhibiting leisure participation and shaping preference vary across both populations and activity contexts. Measures that lack sensitivity to these contextual variations potentially

mask an understanding of factors constraining access. For resource agencies, this can have important implications for their organization and the populations they serve.

Early angling research acknowledged the importance of using context-based indicators for understanding specialization. Chipman and Helfrich (1988) integrated a range of activity-specific attributes to the measure skill, equipment, and resource setting dimensions. Their items included reference to preferences for rod and reel, live or artificial bait, species, and type of water. However, several recent studies of anglers have adopted more general measures, and in some cases excluded contextual aspects that characterize activity-specific attributes all together (See Hawkins et al., 2009; Needham et al., 2009; Salz & Loomis, 2005; Salz et al., 2001). For example, Needham et al.'s (2009) study of Northwest Oregon anglers used a 16 item measure that relied heavily on attitudinal indicators and did not include any contextual indicators to characterize specialization. Although these items assess various dimensions of specialization, general wording coupled with the absence of references to activity-specific attributes prohibits a contextual understanding of the different styles of participation originally noted by Bryan (1979).

Similarly, Salz et al. (2001) developed and tested a specialization measure related to different orientations, experiences, relationships, and commitments among participants. This study was based on Ditton et al.'s (1992) social world perspective of specialization among anglers and, like Needham et al.'s (2009) study, did not include any contextual references. The need to include measures of contextual attributes to characterize specialization may be especially pertinent for differentiating among

populations that expresses similar levels of commitment and behavioral experience in an activity.

The Salience of Specialization Dimensions Among Specialized Populations

Researchers generally agree that specialization is multi-dimensional consisting of behavior, skill and knowledge, and commitment (McIntyre & Pigram, 1992; Scott & Shafer, 2001a). This multi-dimensional approach has proven useful for segmenting general populations of participants in a variety of leisure activities. Although these dimensions have generally been embraced, their salience and utility for revealing specialization heterogeneity may vary among populations and across activities. For example, populations that have the appearance of being "highly specialized" to the outsider likely possess extensive experience, are highly skilled and knowledgeable, and are extremely committed to the activity. Recreational fishing guides reflect such a group. They tend be highly experienced both in terms of the number of years of fished and the number of days annually spent on the water. Consequently, behavioral indicators of experience may not contribute to understanding a guide's style of participation. A guide could have only one year of experience and only guide part-time yet still exhibit a range of participation styles independent of his/her behavioral experience. To date, leisure researchers have given little attention to these issues. Bryan (1977) acknowledged that commitment (i.e., the amount of time and effort invested in a sport) was a critical dimension among all trout angler types but especially salient among the upper end of his typology (i.e., Technique Specialist and Technique/Setting Specialist). Bryan stated that distinction between these specialized types was often difficult due to high levels of

commitment exhibited by participants on the upper end of the continuum. A close examination of Bryan's typology supports this contention and highlights his reliance on activity-specific attributes to differentiate the two most specialized types. The least specialized type, Occasional Anglers, was defined solely in terms of commitment. The next least specialized group, Generalists, was characterized in terms of commitment and technique (i.e., an activity-specific attribute). The two most specialized groups were defined exclusively in terms of technique and setting which are each activity-specific attributes.

Although no studies, to my knowledge, have investigated specialization among fishing guides, Bryan's study of trout anglers is possibly the most similar to my own investigation. Bryan (1979) suggested that most specialized trout anglers were flyfishers and represented the "end-product" or highest level of specialization. While revisiting the origins of specialization, Bryan (2000, p. 344) reflected on his seminal investigation of specialization and noted that his study population was comprised of "highly skilled and committed anglers." Additionally, Bryan relied exclusively on activity-specific attributes to distinguish the two most specialized guide types. Similarly, my study investigates inshore fishing guides that represent the most highly specialized group of inshore anglers. As such, the difficulty Bryan experienced in differentiating the most specialized types of trout anglers may be evidenced among my study population of fishing guides as well. Consequently, measures of commitment and behavior dimensions may provide limited utility for revealing heterogeneity in specialization among this population.

Development of a Self-classification Measure of Specialization

Self-classification measures have received growing attention among specialization researchers as an alternative option for differentiating recreationists compared to traditional multi-item approaches (See Kerins et al., 2007; Needham et al., 2009; Scott et al., 2005; Sorice et al., 2009). Self-classification measures allow research participants to classify themselves into a pre-defined categories of recreationists based on a brief characterization of salient attributes. Respondents are asked to select a category that most closely represents how they participate in an activity even if all criteria do not necessarily apply to them. Self-classification measures provide an attractive alternative to measuring specialization compared to traditional multi-item measures for several reasons: 1) they are well-suited for incorporating styles of participation into discrete options for participants to select , 2) they circumvent measurement issues related to non-linearity of and co-variance identified in previous studies of specialization, 3) they are more parsimonious and provide a simplified approach for resource managers to differentiate their constituency, and 4) they perform as well multi-item measures in their ability to classify recreationists (Kerins et al., 2007; Needham et al., 2009; Scott et al., 2005).

First, there is evidence to suggest that self-classification measures are useful in characterization of specialization in terms of recreationists' distinct styles of participation (Kerins et al., 2007). Typically, these self-classification measures have presented the respondent with three descriptive categories and asked them to select the one they identify with most closely (See Kerins et al., 2007; Needham et al., 2009; Scott

et al., 2005; Sorice et al., 2009). The process of developing these distinct categories results in the inclusion of orientations and behavior that characterize SOP. The development of descriptions to characterize "common types of participants" lends itself to inclusion of orientations and behaviors of involvement as well as elements of activity context.

Second, self-classification measures also circumvent issues related to non-linearity and co-variance noted in previous specialization studies. Past studies have employed two approaches to classifying participants along a continuum: 1) additive indices (Donnelly et al., 1986; Salz et al., 2001; Virden & Schreyer, 1988; Wellman et al., 1982) and 2) cluster analysis (Chipman & Helfrich, 1988; McFarlane, 1994; McIntyre & Pigram, 1992; Scott & Thigpen, 2003) which groups participants together based on their responses to multi-item scales. Limitations, however, have been identified with each of these methods. Researchers have cited issues with the use of additive measures (e.g., summing responses to different measurements) because they assume linearity (See Kuentzel & McDonald, 1992). Kuentzel and McDonald (1992) noted that understanding specialization in terms of a continuum assumes that different dimensions of specialization increase in the same direction and summing respondents' scores across dimensions slights the complexity of dimensional relationships. Responding to the issue, researchers have utilized cluster analysis to segment participants based on their specialization profiles (Chipman & Helfrich, 1988; Scott & Thigpen, 2003). In these analyses, specialization dimensions are used to cluster respondents into homogenous groups, with the emergent segments varying in non-linear patterns (Sorice et al., 2009).

Rather than lying exclusively along a specialization continuum, the emergent segments are often distinguished from one another by a mix of high and low scores on combinations of dimensions. However, unlike additive indices or cluster analysis, a self-classification measure is a more parsimonious approach that does not assume linearity or covariance and does not require the use of advanced multi-variate statistical analyses.

Third, self-classification measures provide a more user-friendly approach for resource managers to differentiate their constituency. Unlike multi-item scales, self classification measures are easily administered and decrease the respondent burden on participants (Needham et al., 2009; Scott et al., 2005).

Last, self-classification measures have performed as well as multi-item scales measuring multiple latent dimensions of specialization (Kerins et al., 2007; Needham et al., 2009; Scott et al., 2005; Sorice et al., 2009). In these investigations, performance is gauged by how well the multi-item measure predicts responses to the self-classification measure. These studies have included analyses of specialization among birders (Scott et al., 2005), anglers (Needham et al., 2009), Ultimate Frisbee players (Kerins et al., 2007), and scuba divers (Sorice et al., 2009). Each study used a multi-item, multi-dimensional specialization measure to predict the responses to a self-classification measure of specialization which included behavior, skill and knowledge, and commitment dimensions. Additionally, Scott et al. (2005) and Kerins et al. (2007) illustrated that their self-classification measures were able to predict motivations among recreationist as well if not better than multi-item measures.

While all the aforementioned studies employed a self-classification measure to capture attributes related to behavior, skill and knowledge, and commitment, my self-classification measure differs in three important ways: 1) it was developed and based solely on contextual attributes (i.e., skill, equipment, and resource setting) that characterize distinct styles of participation; 2) it did not include any reference to elements related to commitment or behavioral experience; and 3) it did not include attitudinal references to characterize contextual attributes. Although Kerins et al.'s (2007) self-classification measure was based on styles of participation, they incorporated references from all three dimensions and relied heavily on commitment and behavioral elements. I contend that understanding participants in terms of their styles of participation based exclusively on context provides a more managerially attractive approach for classification of participants. I would also argue that in a population that appears to be highly specialized, like fishing guides, the inclusion of behavioral experience and commitment may be unnecessary for understanding heterogeneity among participants in terms of SOP.

In sum, the purpose of this research was to develop and test a self-classification measure of specialization based on a single contextual dimension to characterize styles of participation among fishing guides. My self-classification measure included reference to contextual attributes only including skill, equipment and resource setting elements. The performance of this self-classification indicator was then compared to two contemporary measures: 1) a multi-item multidimensional measure, that captures behavior, context (i.e., skill, equipment, and resource setting), and commitment, and 2) a

multi-item, unidimensional measure based on context (i.e., skill, equipment, and resource setting) only. My metric for evaluating each measure's "performance" rested on their ability to reveal heterogeneity in specialization among guides. As I have noted, revelation of this heterogeneity is important for understanding the behavior of guides and resource management.

<div align="center">Methods</div>

Study Population

The sample was drawn from the population of Texas recreational inshore fishing guides. Texas has approximately 1000 saltwater fishing guides that provide for hire service for recreational anglers (TPWD, 2011c) in any given year. TWPD defines a guide as any person who "…for compensation, accompanies, assists, or transports any person engaged in fishing in the waters of the state" (TPWD, 2010a). All guides are required by TPWD to hold a fishing guide license to legally guide anglers within Texas waters. Recreational fishing is economically important to the state generating more than 1.7 billion in total economic output annually (Allen & Southwick, 2006) and guides are an important stakeholder and contributor. Over 1.1 million anglers purchase saltwater fishing licenses and of those approximately 650,000 participate in saltwater fishing annually (Allen & Southwick, 2006; Tseng et al., 2006). One-quarter of all saltwater anglers, and as much as one-third in certain bay systems, that participate in fishing annually hire a guide (Lietz & Grubbs, 2008; Tseng et al., 2006). Guides represent a unique group of recreational fishing participants in that they earn income for guiding other anglers. Regardless of economic motives, from an activity and management

perspective, guides engage in recreational fishing like other general anglers. Pursuit of two species of inshore game fish, red drum (*Sciaenops ocellatus*), and spotted seatrout (*Cynoscion nebulosus*) account for over 60% (1.05 billion) (Southwick, 2006) of the recreational fishing dollars spent and comprise the two primary inshore targets for Texas' fishing guides (Smith et al., 2012).

Data Collection

A 12 page self-administered survey instrument was designed and provided to all TPWD licensed recreational saltwater fishing guides (APPENDIX D). A list containing the names, mailing addresses, and license numbers of all guides holding a saltwater guide license was obtained from the TPWD license division. To ensure only saltwater fishing guides were included in the study, TPWD supplied a guide listing that was comprised exclusively of resident and non-resident all-water (saltwater) and paddle-craft guide license holders. The survey was administered using a modified Dillman et al. (2008) and data collection occurred between April and July of 2011. An initial personalized letter was sent to all guides in the sample (n=909) informing them they had been selected to participant in this study (APPENDIX E). The letter included a brief description of the study purpose and described two options for completing the survey: online (web address was provided) or print version via mail. The letter indicated that recipients could either take the survey online or, if they preferred, wait approximately two weeks for the print version to arrive by mail. Respondents who completed the survey online were required to input an individual code found on the letter in order to gain access. This confirmation was to ensure only licensed guides could take part in the

survey and that each participant could complete the survey only once. The online survey was administered using Qualtrics Labs Inc. software (V17102).

After two weeks, all non-respondents were mailed a survey packet that included a personalized cover letter describing study purpose, the survey questionnaire, and a pre-paid envelope to return the completed survey. One week after the survey packet mailing, a reminder postcard was mailed to all non-respondents. Two weeks after the postcard reminder a final survey packet was sent to non-respondents consisting of another personalized letter, survey questionnaire, and a pre-paid envelope to return the completed survey. The online option produced 202 completed surveys and the hard copy version elicited 189 for a total of 391 useable surveys. After non-deliverables were excluded, the overall response rate was 46%. A non-response bias check was conducted by telephoning 45 guides would did not respond to the survey and asking 10 questions (e.g., "How many days are you on the water guiding anglers in a typical year", "Which species of fish do you prefer to target when guiding?", "If you had to select one bay systems you guide in most of the time which would it be?", etc.) from the original survey. Responses to these 10 survey questions were not statistically different between respondents and non-respondents. Therefore non-response bias was not deemed an issue.

Measures

This study had two main goals: 1) explore the utility of a single-item measure of specialization based on SOP for revealing heterogeneity among Texas inshore fishing guides, and 2) determine if commitment and behavioral dimensions of specialization contribute to revealing heterogeneity among fishing guides. To that end, a single-item,

self-classification measure of specialization was created using a SOP typology of inshore

fishing guides (Smith & Kyle, 2012). The self-classification measure was based on a

single dimension related to context (i.e., skill, equipment, and resource setting). To

achieve my two goals respectively, my self-classification measure was compared against

two adapted versions of a traditional specialization measure developed and used by

Chipman and Helfrich (1988). The first version was a multi-item, multidimensional

measure that included indicators related to a) behavior, b) context (i.e., skill, equipment,

and resource setting), and c) commitment. The second version was a multi-item,

unidimensional measure that included contextual indicators only.

Self-Classification Measure

My self-classification measure was developed based on a contextual style of

participation typology of fishing guides in addition to Bryan's (1979) original typology

of anglers. My contextual understanding emerged from a qualitative study of inshore

fishing guides that I conducted along the Texas coast from Louisiana to Mexico to

explore specialization (Smith et al., 2012). During the summer and fall of 2010, I

conducted eighteen face-to-face, semi-structured, in-depth interviews. Informants were

selected based on my knowledge of the inshore fishing guide social world,

recommendations by other informants, the guide's geographic location (i.e., to ensure all

major bay systems were represented), observed fishing style, and reputation among

anglers and guides alike. My analysis revealed informants characterized SOP within

their social world based primarily on six contextual attributes that included: tackle type,

bait type, fishing technique, casting tactic, water depth, and fish species. I identified four

types of inshore fishing guides that emerged based on contextual styles of participation. These general guide types can be placed on a continuum from least specialized fishing style to most specialized and include Bait Guides, All-purpose Guides, Lure Guides, and Sight-casting guides. The self-classification measure was created to reflect these four general guide types. The qualitative study revealed that certain contextual attributes were more salient than others for characterizing each guide type. Therefore, each self-classification description was tailored incorporate the contextual attributes identified by informants as the most significant for each guide type.

The self-classification measure asked respondents to select a category description that best characterized how they typically engaged in fishing while guiding the majority of the time. Like Bryan's (1977) typology, this measure was not intended to describe every single guide, but instead represented the most common types of guides. The four descriptive categories reflected guide types from least specialized to most specialized style of participation (1 = Bait Guides, 2 = All-purpose Guides, 3 = Lure Guides, and 4 = Sight-casting Guides) and were characterized as follows:

1. We typically blind-cast using natural bait from an anchored, occasionally drifting boat. We target several different species (reds, seatrout, black drum and flounder) of fish depending on which one is biting best.

2. We use a variety of methods to catch fish. We often blind-cast for fish using artificial lures but sometimes use natural bait if needed. We may anchor, drift fish or wade. We typically target seatrout and reds.

3. We typically target big trout in shallow water using artificial lures. We wade fish most of the time but may drift occasionally. We typically blind-cast but may sight-cast to structure or occasional fish.

4. Our main goal is to sight-cast to fish is very shallow water. We mainly flyfish or use light tackle. We often fish from boat but may wade occasionally. We typically catch redfish with a trout or drum on occasion.

Each descriptive category highlighted the most salient contextual attributes representing a particular guide type. For example, category 1 (Bait Guides) are predominately characterized by their use of natural bait, using basic, effective tactics (blind-casting) to catch the most cooperative fish species. Collectively, this self-classification measure reflects a unidimensional approach to measuring specialization based on activity context only.

Multidimensional Measure

My multidimensional and unidimensional measures were adaptations of Chipman and Helfrich's (1988) scale. Chipman and Helfrich (1988) used an 18 item measure comprised of four dimensions (experience, resource use, investment, and centrality) to characterize specialization among Virginia river anglers. The indicators used to measure these dimensions are typical of indicators used in specialization research. I adapted the scale to conform to a contemporary tripartite dimensional approach and indicator terminology was tailored for my population and activity context. For example, Chipman and Helfrich's experience dimension was re-labeled as a behavior dimension in my adapted version. Likewise, their resource use dimension was

relabeled as a contextual (i.e., skill, equipment, and resource setting) dimension. Additionally, the investment and centrality dimensions of the original measure were grouped together and relabeled as a commitment dimension in my adapted version. The selection of this particular scale was based on its incorporation of contextual factors related to skill, equipment, and resource setting that I have argued are fundamental to understanding specialization in terms of SOP. Additionally, this scale is representative of the dimensions proposed by Scott and Shafer (i.e., behavior, skill and knowledge, and commitment) and used in many recent studies (Lee & Scott, 2006; McFarlane, 2004; Oh & Ditton, 2006; Sorice, et al., 2009).

Behavioral Indicators: Two behavioral indicators were used including measures of respondents' *total days guiding in the last 12 months* and *total years of guide experience.* These indicators have also been commonly used to measure behavior in other specialization studies as well (See Anderson, 2003; Ditton et al., 1992; Fisher, 1997; Graefe, 1980; Loomis & Holland, 1997; McFarlane, 2004; Oh & Ditton, 2008; Sorice et al., 2009).

Contextual Indicators: The contextual indictors directed participants to respond to my measures based on how they "typically guide anglers most of the time" and not their personal leisure-based angling preferences. These indicators (i.e., skill, equipment, and resource setting) examined participants' use and preferences for: *tackle type, bait type, water depth, fishing technique, casting technique,* and *species preference*. Similar contextual attributes were also used in Bryan's (1977) study and Chipman and Helfrich's (1988) investigation to characterize specialization. All six indicators were similarly

worded and respondents were instructed to select the option that described their

behavior. For example, for bait type, respondents were asked, "*How would you describe*

the type of bait used most of the time when you are guiding?" Response options for each

indicator, except fish species which is discussed below, were ranked *a priori* in a scaled

manner based on three criteria: 1) my qualitative study of Texas inshore guides (Smith et

al., 2012) in which participants consistently ranked the attribute types, like bait type,

along a specialization continuum, 2) popular notions among the recreational fishing

community regarding skill level associated with each attribute, and 3) the my knowledge

of recreational inshore fishing. In parentheses, my coding schema was structured such

that higher values reflected a more specialized preference or behavior.

Tackle type referred to a preference for rod and reel combination such as

spinning, casting, light tackle, and flyrod (e.g., spinning = 1, casting = 2, fly or light

tackle = 3). *Bait type* referred to preference for natural bait, artificial lures, or flies while

guiding most of the time (e.g., mostly natural bait = 1, artificial lure and natural bait = 2,

mostly artificial lures = 3, and mostly fly = 4). *Water depth* referred to a preference for a

particular depth of water (e.g., greater than four feet = 1, less than four feet = 2, less than

two feet = 3). *Fishing technique* described the manner in which a guide approached and

engaged the fish or fishing situation (e.g., from shore = 1, anchored from boat = 2,

drifting from boat = 3, trolling motor on a boat = 4, drifting/anchored from kayak = 5,

wading = 6, poling a skiff = 7). *Casting tactic* represented the act of casting to a general

area or a specifically casting to a fish, substrate, structure, or water disturbance (e.g.,

blind-casting = 1, blind-casting with some sight-casting to structure of fish = 2, sight-

casting to fish = 3). *Species preference* referred to the species of fish typically caught or targeted.

To determine preference for fish species, respondents were asked "*Which species of fish do you prefer to target when guiding*?" Because SST and red drum comprise the bulk of recreational inshore fishing effort and nearly all guides target one or both, fish species could only be ranked *post hoc* in light of how guides pursued or targeted the fish. Thus, I focused on preference for SST and red drum in relation to the respondent's preference for bait type, fishing technique, and water depth. Examination of fish species preference in conjunction with how, where, and with what provided insight to the specialization required to target a particular species. For example, a redfish caught on natural bait while anchored in three feet of water reflects less specialization needed to catch the fish compared to a redfish caught using a fly, while wading, in 10 inches of water. To that end, I established criteria using these attributes to rank red drum and SST species from one (least specialized) to four (most specialized) as follows: If targeting red drum or SST and bait = 1, fishing technique $\leq$ 3, water depth $\geq$ 1 then species = 1; If targeting red drum or SST and bait $\geq$ 2, fishing technique $\geq$ 3, water depth $\geq$ 1 then species =2; If targeting SST and bait $\geq$ 3, fishing technique $\geq$ 5, water depth $\geq$ 3 then species = 3; If targeting red drum and bait $\geq$ 3, fishing technique $\geq$ 3, water depth $\geq$ 3 then species = 4.

Commitment Indicators: Measures of commitment included the *replacement value of all fishing equipment* and *number of fishing or conservation memberships* as well as the following statements: *If I stopped fishing an important part of my life would*

be missing, participation in fishing is a large part of my life, and *I would rather go fishing than do almost anything else*. My earlier qualitative work revealed that guides used the term "guiding" and "fishing" interchangeably. Given that I was primarily concerned with their attitudes about their fishing behavior while guiding and not their attitudes toward their career, the term "fishing" was intentionally left and not replaced with "guiding" in these statements. Each of these statements was measured on a 5 point scale ranging from 1 (strongly disagree) to 5 (strongly agree). Like the behavioral and contextual indicators, these commitment items have also been used in many other specialization studies (Loomis & Holland, 1997; Moore et al., 2008; Needham et al., 2009; Oh & Ditton, 2006; Scott et al., 2005; Wellman et al., 1982) in addition to Chipman and Helfrich's (1988) study.

Unidimensional Measure

The multi-item, unidimensional measure included the same indicators measuring the contextual dimension (i.e., skill, equipment, and resource setting) discussed above. As noted, these items were adapted from Chipman and Helfrich's (1988) study.

Data Analysis

In order to address both research objectives, discriminant analyses (DA) were conducted using both the multidimensional measure and the unidimensional measure to determine how well each approach predicted responses to the self-classification measure. High classification of responses using the multidimensional items would support the utility of my self-classification measure. Similarly, high classification of responses using the unidimensional items would suggest that commitment and behavior dimensions may

not be useful for revealing heterogeneity among my population.

Discriminant analysis is a robust tool that is used to predict group membership of one or more continuous predictor variables (Vaske, 2008). The goal of DA is to classify respondents into groups based on a prediction equation, evaluate the contribution of independent variables in correctly classifying the dependent variable, and determine the variance explained by the independent variables (Vaske, 2008). This analysis generates a maximum number of functions that is usually one less than the dependent variable - my self-classification measure (Needham et al., 2009). Reported eigenvalues indicate how much variance is explained by each function and canonocial correlations represent the degree of association between discriminant scores and the dependent variable (Vaske, 2008). The Wilks' Lambda examines the equality among group centroids (means) with smaller values indicating the relative importance of the function. Standardized coefficients signify the relative importance of each independent variable in its ability to predict the dependent variable with larger coefficients indicating greater importance (Vaske, 2008). Recent studies have effectively employed this analysis to assess the utility of self-classification measures compared to multi-dimensional measures of specialization (Kerins et al., 2007; Needham et al., 2009; Scott et al., 2005). Analysis of variance (ANOVA) using least significant differences and Games-Howell post-hoc tests (if necessary) were employed to identify significant differences among self-classification categories (Bait Guides, All-purpose Guides, Lure Guides, and Sight-casting Guides).

Findings

Descriptive Characteristics

Overall, respondents reported an average age of 52 years (Table 1), were predominately male (98.6%), and white (86.9%). Additionally, 46.5% of the sample indicated guiding was their primary source of income while 28.4% reported they worked part-time as a guide in addition to their full-time job. Over 64% reported they earned over $60,000 per year and 40% indicated they held an associate's degree or higher. Bait Guides represented 39.4% of the population, All-purpose Guides comprised 42.7%, and Lure and Sight-casting Guides constituted 8.4% and 9.5% respectively.

Contrary to past research that has suggested the most specialized groups in a population possess the most behavioral experience, my findings suggest the reverse is true among Texas inshore fishing guides based on SOP. As displayed in Table 1, total years of guiding experience decreased in a linear fashion from the least specialized guide group to the most specialized (i.e., Bait Guides = 14.37 years, All-purpose Guides = 12.40, Lure Guides = 11.37, and Sight-casting Guides = 10.89). Similarly, annual avidity was also highest among the least specialized guide type (Bait Guides = 114.75 days of annual participation) and lowest among the most specialized guide type (Sight-casting Guides = 94.0 days of annual participation). Mean scores for tackle type, bait type, species type, fishing technique, and casting tactic (Table 2) all increased in a linear manner from the least specialized guide group to the most specialized guide group.

Table 1 Descriptive Information

	Overall	Self-classification Categories			
		Bait	All-purpose	Lure	Sight-casting
Age in years (*M, SD*)	52.0, 11.5	53.0, 12.7	51.8, 10.5	49.9, 11.2	50.9, 10.1
Gender (%, n)					
Male	98.6, 352	99.3, 137	98.1, 151	96.8, 30	97.1, 33
Female	1.4, 5	.7, 1	1.9, 3	3.2, 1	2.9, 1
Education (%, n)					
High school or less	2.8, 10	3.6, 5	2.6, 4	3.3, 1	0,0
High school graduate	18.2, 65	20.1, 28	20.8, 32	10.0, 3	5.9, 2
Some college	38.3, 137	33.8, 47	43.5, 67	30.0, 9	38.2, 13
Associates degree (2 year)	13.1, 47	12.9, 18	11.0, 17	26.7, 8	11.8, 4
Bachelors degree (4 year)	23.2, 83	25.9, 36	18.2, 28	23.3, 7	35.3, 12
Masters, doctoral or professional degree	4.5, 16	3.6, 5	3.9, 6	6.7, 2	8.8, 3
Race/Ethnicity (%, n)					
Hispanic	10.3, 37	8.6, 12	10.5, 16	13.3, 4	14.7, 5
White	86.9, 311	86.4, 121	87.6, 134	86.7, 26	85.3, 29
Black or African-American	.6, 2	1.4, 2	0,0	0,0	0,0
Native American or Alaskan Native	2.2, 8	3.6, 5	2.0, 3	0,0	0,0
Asian or Pacific Islander	0,0	0,0	0,0	0,0	0,0
Other	0,0	0,0	0,0	0,0	0,0
Employment (%, n)					
Guiding is my primary source of income	46.5, 167	54.3, 76	39.6, 61	46.7, 14	44.1, 15
I have a full time job and guide part-time	28.4, 102	20.0, 28	34.4, 53	33.3, 10	32.4, 11
I am retired, but guiding is my primary source of income	13.9, 50	18.6, 26	12.3, 19	10.0, 3	5.9, 2
I am retired and work part-time as a guide	6.1, 22	2.9, 4	9.1, 14	3.3, 1	8.8, 3
Other	5.0, 18	4.3, 6	4.5, 7	6.7, 2	8.8, 3
Income (%, n)					
Less than $20,000	3.6, 12	4.6, 6	2.8, 4	3.4, 1	3.1, 1

Table 1 Continued

	Overall	Self-classification Categories			
		Bait	All-purpose	Lure	Sight-casting
$20,000 - $39,000	10.7, 36	13.1, 17	9.0, 13	6.9, 2	12.5, 4
$40,000 - $59,000	20.8, 70	22.3, 29	18.1, 26	27.6, 8	18.8, 6
$60,000 - $79,000	18.5, 62	19.2, 25	21.5, 31	13.8, 4	6.3, 2
$80,000 - $99,000	17.3, 58	15.4, 20	21.5, 31	0	21.9, 7
$100,000 - $149,000	19.6, 66	17.7, 23	20.1, 29	20.7, 6	25.0, 8
Over $150,000	9.5, 32	7.7, 10	6.9, 10	27.6, 8	12.5, 4
Total years guiding experience in years (*M, SD*)	13.0, 9.8	14.4, 11.0	12.4, 8.9	11.4, 8.1	10.9, 8.4
Annual avidity in days (*M, SD*)	160.0, 68.0	166.2, 64.6	154.7, 71.6	166.3, 66.2	152.7, 66.5
n (%)	370	146 (39.4)	158 (42.7)	31 (8.4)	35 (9.5)

Table 2 Responses to Specialization Indicators for Each Self-classification Category

Specialization Dimensions and Indicators		Self-classification Category[1] (*M, SD*)				F	p
	Overall	Bait	All-purpose	Lure	Sight-casting		
Behavior							
Total years of guide experience	12.95, 9.76	14.37, 11.05	12.40, 8.92	11.37, 8.12	10.89, 8.39	2.01	.113
Total days guiding in a typical year	108.26, 64.41	114.75, 60.91	105.34,66.86	108.23, 64.69	94.00, 66.97	1.17	.320
Context (Skill, Equipment and Resource Setting)							
Tackle type[2]	1.55, .61	1.34^{AB}, .49	1.47^{CD}, .50	1.94^{ACE}, .25	2.41^{BDE}, .82	45.72	.000
Bait type[3]	1.85, .91	1.08^{A}, .29	2.07^{A}, .69	2.81^{A}, .48	3.26^{A}, .71	210.87	.000
Species preference[4]	1.83, .97	1.04^{A}, .29	1.99^{A}, .69	2.76^{A}, .51	3.60^{A}, .81	209.68	.000
Water depth[5]	2.01, .66	1.93^{A}, .64	1.88^{B}, .62	2.06^{C}, .44	2.86^{ABC}, .35	26.91	.000
Fishing technique[6]	3.45, 1.67	2.26^{ABC}, .60	3.67^{ADE}, 1.46	5.52^{BD}, 1.06	5.53^{CE}, 1.80	112.41	.000
Casting tactic[7]	1.95, .48	1.84^{A}, .42	1.89^{B}, .42	1.94^{C}, .25	2.69^{ABC}, .47	41.39	.000
Commitment							
Replacement value of all fishing equipment (Dollars)	70448, 95349	71718, 127814	72809,77580	65095, 30888	59400, 28751	.28	.878
Number of fishing or conservation memberships	1.45, 1.77	1.43, 2.07	1.29, 1.45	1.67, 1.68	2.09, 1.70	2.10	.100
If I stopped fishing, an important part of my life would be missing[8]	4.69, .58	4.68, .57	4.70, .52	4.65, .84	4.71, .62	.13	.940
I would rather go fishing than do almost anything else[8]	4.13, .91	4.04, .97	4.18, .90	4.19, .83	4.17, 82	.655	.580
Participation in fishing is a large part of my life[8]	4.56, .57	4.56, .55	4.55, .55	4.58, .62	4.57, .66	.043	.988
n (%)		146 (39.4)	158 (42.7)	31 (8.4)	35 (9.5)		

[1] Reported data for self-classification category represent means. Like uppercase superscripts indicate significant difference using LSD Test at 0.05 level or Games-Howell.

 The following indicators were measured on a scale from least to most specialized and then coded 1 to n.

[2] Spinning=1, casting=2, fly or light tackle=3

[3] Mostly natural bait=1, artificial lure and natural bait=2, mostly artificial lures=3, mostly fly=4

[4] Species preference for red drum and seatrout only (If targeting red drum or seatrout and bait=1, fishing technique<=3, water depth>=1 then species =1; If targeting red drum or seatrout and bait>=2, fishing technique >=3, water depth>=1 then species =2; If seatrout and bait >=3, fishing technique >=5, water depth>=3 then species =3; If targeting red drum and bait>=3, fishing technique >=3, water depth>=3 then species =4

[5] Greater than four feet =1, less than four feet=2, less than two feet=3

[6] Shore =1, anchored from boat =2, drifting from boat=3, trolling motor on a boat=4, drifting/anchored from kayak=5, wading =6, poling a skiff =7

[7] Blind casting =1, blind casting with some sight-casting to structure of fish =2, sight-casting to fish =3

[8] Measured on a 5 point scale ranging from 1 (strongly disagree) to 5 (strongly agree)

Only mean scores for water depth deviated with the second least specialized group, (All-purpose Guides = 1.93) reporting the lowest scores while the most specialized group (Sight-casting Guides = 2.86) reported the highest scores. The two least specialized guide types reported the highest replacement cost of all equipment (i.e., Bait Guides = $ 71,718; All-Purpose Guides = $72,809), while the most specialized guide type reported the lowest (Sight-casting Guides = $59,400). Sight-casting guides had the most fishing or conservation memberships ($M = 2.09$) and All-purpose Guides had the least ($M = 1.29$). All three groups reported similar mean scores for the remaining commitment indicators.

Variations in Specialization Among Guides

Analysis of variance revealed no significant differences among self-classification categories for all indicators in the behavior and commitment dimensions (Table 2). Conversely, mean responses for all six indicators of the contextual (i.e., skill, equipment, and resource setting) dimension differed significantly between self-classification categories ($F = 26.91$ to 210.68, $p < .001$). For *tackle type*, the mean responses for Lure Guides ($M = 1.94$, $SD = .25$) and Sight-casting guides ($M = 1.94$, $SD = .25$) differed significantly from all other groups. Mean response for *bait type* (Bait Guides, $M = 1.08$, $SD = .29$; All-purpose Guides, $M = 2.07$, $SD = .69$; Lure Guides, $M = 2.81$, $SD = .48$; Sight-casting Guides, $M = 3.26$, $SD = .71$) and *species preference* (Bait Guides, $M = 1.04$, $SD = .29$; All-purpose Guides, $M = 1.99$, $SD = .69$; Lure Guides, $M = 2.76$, $SD = .51$; Sight-casting Guides, $M = 3.60$, $SD = .81$) differed significantly among all groups. Sight-casting guide mean responses for water depth ($M = 2.86$, $SD = .35$) were

significantly different from Bait Guides ($M = 1.93$, $SD = .64$), All-purpose Guides ($M = 1.88$, $SD = .62$) and Lure Guides ($M = 2.06$, $SD = .44$). Similarly, Sight-casting Guides also reported higher means for casting tactic ($M = 2.69$, $SD = .47$) compared to Bait Guides ($M = 1.84$, $SD = .42$), All-purpose Guides ($M = 1.89$, $SD = .42$) and Lure Guides ($M = 1.94$, $SD = .25$). Lastly, Bait Guides responses ($M = 2.26$, $SD = .60$) and All-purpose Guides ($M = 3.67$, $SD = 1.46$) differed on *fishing technique* preference from all other guide types while no significant differences existed between Lure ($M = 5.52$, $SD = 1.06$) and Sight-casting Guides ($M = 5.53$, $SD = 1.80$).

Prior to conducting DA, I first established the validity and reliability of the multi-item scales beginning with confirmatory factor analysis (CFA in LISREL V8.8) and then the calculation of composite reliabilities for each of the specialization dimensions. Findings from the CFA illustrated satisfactory model fit[1]; $\chi^2 = 173.69$, df $= 62$, RMSEA $= .073$, CFI $= .92$, IFI $= .92$, and NFI $= .90$) suggesting that these indicators are valid representations of their latent dimensions (Brown, 2006). Factor loadings ranged between .40 and .83 and were all above .4 (Hair et al., 1998). Following the CFA, composite reliabilities were also calculated and ranged between .70 and .72 (Raykov, 2001); all falling above .70 (Hult et al., 2006).

Utility of a Single-Item Measure to Revealing Heterogeneity

Discriminant analysis was then performed using all indicators from the multi-

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[1]The goodness-of-fit indices that I used to empirically assess fit where the root mean square error of approximation (RMSEA; Steiger & Lind, 1980), the normed fit index (NFI; Bentler & Bonnett, 1980), the comparative fit index (CFI; Bentler, 1990), and the incremental fit index (IFI; Bollen, 1989). Generally accepted values for each of these fit indices are; (a) RMSEA values falling between .06 - .08 indicate acceptable fit with .10 considered the upper limit (Byrne, 2000), (b) NFI values greater than .90 (Kenny, 2011), and (c) IFI and CFI values greater than .95 (Hu & Bentler, 1998).

item, multidimensional measures to assess how well each predicted responses to my self-classification measure. Three functions were generated for the multidimensional measure (i.e., four self-classification categories minus one) with functions 1 and 2 explaining 98.1% of the variance and function 3 accounting for only 2% (Table 3). Canonical correlations were higher for functions 1 (R_c = .871) and 2 (R_c = .556) compared to function 3 (R_c = .258). Functions 1 and 2 had larger eigenvalues (3.133 and .448 respectively) than function 3 (.071). Additionally, the Wilks' Lambda value (λ = .933) for function 3 was relatively high compared to function 2 (λ = .645), and extremely high compared to function 1 (λ = .156), indicating little separation between group means (Vaske, 2008). Collectively, these results indicate function 3 explains little beyond functions 1 and 2, therefore only the first two functions will be examined further.

Standardized coefficients for function 1 and 2 of the multidimensional measure indicated that only the contextual indicators measuring skill, equipment, and resource setting significantly predicted participant responses to the self-classification measure (Table 4). All six indicators in this dimension (i.e., *tackle type, bait type, species type, water, depth, fishing technique,* and *casting tactic*) had statistically significant F-values (F = 23.73 through 239.59). Standardized coefficients from function 1 indicated *bait type* (β_1 = .523) and *species type* (β_1 = .398) were the most discriminating variables. In function 2, *tackle type* was most discriminating (β_2 = .607) with *water depth* (β_2 = .492) and *casting tactic* (.463) following closely. No indicators from the behavior or commitment dimensions significantly predicted responses in function 1 or 2.

Table 3 Discriminant Analysis Results - Multidimensional Measure

Function	Eigenvalue	Percent Variance	Canonical Correlation (R_c)	Wilks' Lambda (λ)	Chi-square (χ^2)	df	p
1	3.133	85.8	.871	.156	552.75	39	.000
2	.448	12.3	.556	.645	130.63	24	.000
3	.071	2.0	.258	.933	20.48	11	.039

Table 4 Discriminant Function Coefficients - Multidimensional Measure

Dimensions and Indicators	Function 1 Standardized Coefficient (β_1)	Function 2 Standardized Coefficient (β_2)	F	p
Behavior				
Total years of guide experience	-.123	-.004	1.71	.164
Total days guiding in a typical year	-.082	-.095	.928	.427
Context (Skill, Equipment, and Resource Setting)				
Tackle Type	.233	.607	42.95	.000
Bait Type	.523	-.613	239.59	.000
Species Type	.398	.426	211.43	.000
Water Depth	.028	.492	23.73	.000
Fishing Technique	.099	-.449	108.46	.000
Casting Tactic	.232	.463	37.10	.000
Commitment				
Replacement value of all equipment (Dollars)	.033	.051	.153	.928
Number of fishing or conservation memberships	.031	.090	.730	.535
If I stopped fishing, an important part of my life would be missing	-.061	-.092	.620	.602
Participation in fishing is a large part of my life	-.136	-.136	1.19	.315
I would rather go fishing than do almost anything else	.099	.099	.162	.922

Group centroids (Table 5) distances for function 1 (Bait Guide = -1.790, All-purpose Guide = .331, Lure Guide = 2.00, Sight-casting Guide = 3.853) and function 2 (Bait Guide = .438, All-purpose Guide = -.554, Lure Guide = -.772, Sight-casting Guide = 1.375) were well dispersed demonstrating that indicators effectively discriminated guide types from one another. Overall, the multidimensional measure correctly classified 83.7% of the cases (Table 5). Categorically, correct classification included 97.5% of Bait

Guides, 74.8% of All-purpose Guides, 74.1% of Lure Guides, and 76.7% of the Sight-casting Guides.

Table 5 Discriminant Analysis Classification Results Using Multidimensional Measure

Actual self-classification	Predicted self-classification membership[1]				Group Centroids	
	Bait	All-purpose	Lure	Sight-casting	Function1	Function 2
Bait Guide	**97.5**	1.7	.0	.8	-1.790	.438
All-purpose Guide	16.0	**74.8**	8.4	.8	.331	-.554
Lure Guide	.0	25.9	**74.1**	.0	2.00	-.772
Sight-casting Guide	.0	23.3	.0	**76.7**	3.853	1.375

[1] 83.7 % of original grouped cases correctly classified

Contribution of Commitment and Behavior for Revealing Heterogeneity

Similarly, DA was conducted on the multi-item, unidimensional measure to explore the contribution made by behavioral and commitment indicators to distinguishing heterogeneity among my study population. All result values exhibited similar results compared to the multi-item multidimensional measure (Table 6) and again, standardized coefficients for function 1 and 2 of the unidimensional measure confirm all six indicators in the contextual dimension (i.e., skill, behavior, and resource setting) significantly predicted responses to the self-classification measure (Table 7). Overall, the unidimensional measure correctly classified 84.0% of the cases (Table 8). Categorically, correct classification included 97.6% of Bait Guides, 75.0% of All-purpose Guides, 75.9% of Lure Guides, and 76.7% of the Sight-casting Guides

Table 6 Discriminant Analysis Results - Unidimensional Measure

Function	Eigenvalue	Percent Variance	Canonical Correlation (R_c)	Wilks' Lambda (λ)	Chi-square (χ^2)	df	p
1	2.800	85.5	.858	.176	556.182	18	.000
2	.431	13.1	.549	.668	128.975	10	.000
3	.046	1.4	.209	.956	14.330	4	.006

Table 7 Discriminant Function Coefficients - Unidimensional Measure

Dimensions and Indicators	Function 1 Standardized Coefficient β_1	Function 2 Standardized Coefficient β_2	F	p
Context (Skill, Equipment and Resource Setting)				
Tackle Type	.246	.589	42.674	.000
Bait Type	.499	-.611	240.069	.000
Species Type	.400	.421	209.679	.000
Water Depth	-.011	.483	23.959	.000
Fishing Technique	.124	-.422	110.536	.000
Casting Tactic	.233	.510	37.805	.000

Table 8 Discriminant Analysis Classification Results Using Unidimensional Measure

Actual self-classification	Predicted self-classification membership[1] Bait	All-purpose	Lure	Sight-casting	Group Centroids Function1	Function 2
Bait Guide	**97.6**	1.6	.0	.8	-1.672	.422
All-purpose Guide	18.6	**75.0**	6.4	.0	.303	-.519
Lure Guide	.0	24.1	**75.9**	.0	1.992	-.804
Sight-casting Guide	.0	23.3	.0	**76.7**	3.737	1.410

[1] 84.0 % of original grouped cases correctly classified

Discussion

The first goal of this paper was to develop and explore the efficacy of a single item self-classification measure of specialization based on contextual styles of participation. To that end, my self-classification measure was compared against an

adapted multi-item, multidimensional measurement. Findings from my DA indicated that the multidimensional measure predicted 83.7% of the cases correctly. These classification values are comparable, if not higher, than values reported in previous studies that have investigated self-classification measures. For example, Needham et al.'s (2009) study reported 88% correct classification among anglers, Scott et al. (2005) reported 71% correct classification among birders and Kerins et al. (2007) reported a 71% correct classification of Frisbee players. Given the high classification rate, my results support previous research illustrating that single-item self-classification measures of specialization perform as well as multi-item measures (Kerins et al., 2007; Needham et al., 2009; Scott et al., 2005; Sorice et al., 2009).

Furthermore, a single-item measure of specialization based on SOP has several advantages for understanding diversity among recreational fishing participants. Past studies have noted the benefits of self-classification measures compared to multidimensional approaches such as user friendliness, ease of administration, intuitiveness, reduction of response burden, elimination of the need for advanced multivariate analyses, and allowing respondents to classify themselves (Needham et al., 2009; Scott et al., 2005). However, Needham et al. (2009) noted that one of the problems with previous self-classification approaches is that the categories reflected a continuum of progression. Recent work has begun to challenge this idea (Kuentzel, 2001; Kuentzel & Heberlein, 2006, 2008; Scott & Godbey, 1994; Scott & Lee, 2010; Scott & Shafer, 2001a). A self-classification measure based on styles of participation circumvents this issue and treats each category as a separate trajectory of participation or unique type of

activity engagement.

Self-classification measures also avoid issues related to the assumption of linearity among dimensions. Researchers have noted that all dimensions of specialization may not increase uniformly as individuals' level of specialization also increases (Kuentzel & McDonald, 1992; Scott et al., 2005). I also observed this pattern among my dimensions with guide experience inversely related to increased specialization. The least specialized guide type reported the most guiding experience (Bait Guides = 14.37 years) while the most specialized guide type exhibited the least guiding experience (Sight-casting Guides = 10.89 years). Similarly, guiding avidity did not increase linearly with increasing specialization. Self-classification measures do not assume linearity or that dimensions covary.

Although my study investigated contextual SOP among inshore fishing guides, this population does not participate in fishing any differently than general anglers from a management perspective. Additionally, guide fishing styles are reflective of the broader angling community and represent styles of participation prevalent among general recreational inshore anglers. Consequently, understanding specialization in terms of SOP is uniquely suited to provide fisheries agencies a management approach based on contextual, activity-specific elements of the fishing experience they can control for all angling participants. Fisher (1995) noted that fisheries managers have the ability to manipulate fishing context through regulation of where, when, how, and with what participants engage the activity. Understanding specialization in terms of SOP facilitates segmentation of guides based on how they engage the activity. This contextual approach

may provide resource managers a more precise and efficient method for understanding diversity compared to contemporary specialization measures that rely more heavily on attitudinal indicators of activity involvement. This understanding will enable them to provide diverse angling opportunities that accommodate varying fishing styles.

The second goal of this paper was to investigate the contribution of commitment and experience in revealing heterogeneity among my study population. Findings from my DA indicated that the unidimensional measure, which included contextual indicators only, predicted 84.0% of the cases correctly. The unidimensional measure actually performed slightly better than the multidimensional measure, which included behavioral and commitment indicators as well as contextual measures, in predicting case classification. This suggests that commitment and behavior offer little assistance in revealing heterogeneity among my population of highly specialized inshore fishing guides. This is likely due to extensive on-water avidity and years of experience of this population. I suggest that a single-item, unidimensional measure based on context may be as useful as a multi-item, multidimensional measure for differentiating highly specialized populations in nature based activities.

This study has several limitations. Unlike general self-classification measures that may be used across varying activities to segment recreationists, my contextual self-classification measure is customized for Texas coastal fishing guides. Although this self-classification measure may also reflect general coastal anglers in Texas and might be applicable to other Gulf States, the measure I developed may not translate well to other locales or activities. My measure was customized and developed from my qualitative

investigation of guides based on contextual styles of participation. Other locales may have greater diversity with regard to fish species, habitat, or cultural preferences that result in a more diverse range of contextual fishing styles. However, the contextual approach and methods I utilized for this investigation would translate to other nature-based activity and locales. Additionally, the development of my self-classification emerged from extensive field work (i.e., participant observation and in-depth interviews) focused on exploring guide participation styles. This process may prove too costly or time consuming for other activities or situations. I would contend, however, that an intimate understanding of the study context will always benefit research efforts. If the researcher is able to embed themselves within the study context, by partnering with professionals or other colleagues closely aligned to the activity or setting, they will be better positioned to develop methods (and measures) that more accurately capture the phenomena of interest. Lastly, my self-classification measure was designed for a highly specialized population where conventional measures of commitment and behavioral experience reveal universally high levels of engagement. For general angler populations, commitment and past behavior may be more relevant and provide valuable insight on specialization characterization.

In sum, whereas previous single-item, self-classification measures of specialization have relied heavily measures of commitment and past behavior, my self-classification measure based on styles of participation is grounded in the context of the activity. Among this population of highly specialized participants, context was the discriminating factor that allowed segmentation and the revelation of heterogeneity.

Regardless of population, future research should consider returning to Bryan's (1979)

original tenets underlying his characterization of specialization by including contextual,

activity-specific indicators to characterize specialization.

CHAPTER IV

USING STYLE OF PARTICIPATION TO UNDERSTAND DISPLACEMENT AND

SUBSTITUTION AMONG TEXAS INSHORE FISHING GUIDES IN RESPONSE TO

PERCEIVED DECLINES IN SPOTTED SEATROUT POPULATIONS

The spotted seatrout (*Cynoscion nebulosus*) is one of the most highly sought-after game fish in the coastal waters of Texas (Anderson & Ditton, 2004). The existence of a flourishing spotted seatrout (SST) population is critical for the state of Texas and its citizens from both a recreational and economic perspective. Each year, over 634,000 saltwater anglers target SST and devote nearly 9,000,000 days to its pursuit (Allen & Southwick, 2006). The pursuit of this single species accounts for over 27% ($487 million) of Texas' total 1.8 billion dollar recreational saltwater fishing industry output (Allen & Southwick, 2006). Maintenance of thriving SST stock is critical for the continued financial infusion to the State's economy and the enjoyment of anglers that target this species throughout Texas coastal waters.

Over the past several years, dramatically reduced SST catches among some anglers has lead to a perception of severe SST population decline in multiple bay systems. Perceptions of SST decline worsened among some anglers during 2010 and fueled a growing chorus for resource managers to address this issue (TPWD, 2011d). In response, TPWD Coastal Fisheries Division hosted a series of scoping meetings in January 2011 to assess support for implementation of SST conservation measures. Upon the completion of seven scoping meetings, TPWD Coastal Fisheries Division declined to

recommend changes to SST regulations due to lack of biological urgency (i.e., increased recruitment of SST), relatively high angler satisfaction, and divided reactions to SST management options (TPWD, 2011d).

Irrespective of actual SST population declines, perceived decline of SST populations may have major implications for resource managers. Participants who target SST and perceive a decline in their overall abundance or desired size may experience displacement. Displacement is a shift in angler behavior patterns in response to a change in the fishery such as declining fish stocks (Ditton & Clark, 1995). Research has indicated that anglers will sometimes modify their behavior to overcome certain constraints in order to continue fishing (Jackson et al., 1993). Potential behavioral modification due to perceived SST declines could lead to a variety of alternative behaviors including substitution of fish species, location, and fishing method or even cessation of the activity (Ditton & Sutton, 2004). This behavior modification could result in increased fishing pressure on alternative game fish species, increased crowding in nearby bays, and adoption of unfamiliar fishing equipment, techniques, and methods. Displacement could also lead to a reduction in the overall number of anglers, fishing frequency, angler expenditures, and fishing licenses sold. However, research suggests that not all anglers are displaced equally (Ditton & Clark, 1995). Anglers are a diverse group of participants that exhibit distinct contextual styles of participation (i.e., preferences and behavior that characterize an angler's involvement) (Bryan, 1977). Characterization of anglers using activity context (i.e., where, when, how, and with what) allows managers to understand, predict, and manage potential or actual

displacement. Inshore fishing guides are one group of inshore fishing participants that may be particularly impacted by displacement due to perceived SST population declines.

Texas inshore fishing guides are in a unique position to provide resource agencies valuable insight on perceptions of SST declines statewide and speak to the potential management implications resulting from displacement due to perceived decline. Due to their years of experience, on-water frequency, diffuse geographic positioning, and the amount of fishing effort they direct toward SST, guides can provide an unparalleled perspective on perceived SST populations and trends over time. Texas has, on average, approximately 1000 licensed recreational saltwater fishing guides (TPWD, 2011c) that "…for compensation, accompanies, assists, or transports any person engaged in fishing in the waters of the state" (TPWD, 2011a). In addition to their extensive angling experience prior to becoming a guide, a recent study of inshore guides revealed they have an average of 13 years of experience guiding other anglers and spend over 108 days guiding annually (Smith & Kyle, 2012). Over 90% of these inshore guides identified SST as their primary or secondary target species while guiding. The focused efforts guides direct toward SST make them particularly sensitive to SST decline and associated displacement. Guide sensitivity to SST decline may make them more susceptible to displacement resulting in substitution behavior that may exacerbate issues related to fisheries management.

Guide perceptions of SST populations may have direct and indirect implications for fisheries managers. Over 650,000 anglers participate in saltwater fishing each year in Texas and one-quarter of those participants report hiring a guide in a given year (Tseng

et al., 2006). The number of anglers hiring guides may be as high as one-third in some bay systems (Lietz & Grubbs, 2008). Displaced guides may be unable to provide a satisfactory fishing experience for their customers leading to a reduction in participation by displeased anglers. This could lead to a reduction in the number of guides and decrease the number and types of fishing opportunities for anglers. Guide perceptions of SST decline and associated displacement may also indirectly influence other anglers' behavior due to their status in the inshore fishing community. Guides are a heterogeneous group exhibiting distinct fishing styles that may influence fishing styles among the larger angler population (Smith et al. 2012). Guides are often revered for their fishing style, and anglers seek their advice and opinion regarding when, where, and how they should fish for a particular species. Guide perceptions and associated behavior are often disseminated through a variety of media and social outlets and may assist in shaping the collective opinions of the broader inshore angling community. Subsequently, guide perceptions may ultimately facilitate behavior modification in the general angler population as well exacerbating management issues.

The purpose of this study was to use SOP to detect heterogeneity in displacement behavior among Texas inshore fishing guides in response to perceived SST declines in 2010. A self-classification measure of specialization (Smith & Kyle, 2012) based on contextual styles of participation was used to examine variation among guides with respect to their displacement behavior (e.g., substitution of fish species, location, and fishing method).

Literature Review

Importance of Recreational Fishing for SST in Texas

Recreational anglers have been identified as important stakeholders to fishery resource management agencies and as contributors to local, regional, and national economies (Finn & Loomis, 2001). This statement holds true for anglers in the U.S. at both the national and state level. The U.S. has over 7.7 million licensed saltwater anglers that fish over 85.7 million days annually and contribute over 8.9 billion to the U.S. economy (USDI, 2006). Saltwater anglers take over 67 million trips a year and spend $751 per trip and nearly $62 per day. National averages indicate a downward trend among saltwater angler participation between 2001 and 2006 with saltwater anglers declining from 9.0 million in 2001 to 7.7 million in 2006 (USDI, 2006). Despite this 15% decline nationally, Texas added over 287,000 saltwater anglers between 2001 (860,000) and 2006 (1.147 million) representing a 25% increase during that time span (USDI, 2001; 2006).

The increase in the number of saltwater anglers is a welcome economic benefit for Texas. Texas ranks third, behind Florida ($5.12 billion) and California ($2.82 billion), in the nation in total economic output from saltwater fishing (Allen & Southwick, 2008). In total, saltwater fishing in Texas accounts for nearly $1.8 billion annually in total economic output, with over 1.1 million anglers purchasing fishing license each year (Allen & Southwick, 2006). The bulk of these anglers, and their financial outpouring, is centered around the pursuit of red drum (*Sciaenops ocellatus*) and SST. Nearly 60% ($1.05 billion), of the total economic output generated by

saltwater anglers in Texas, both inshore and offshore, is directed toward these two inshore species. In particular, SST have garnered special attention from anglers and guides possibly ranking as the most targeted inshore species in Texas waters.

The popularity of fishing for SST in Texas is undeniable. SST fishing is the subject of countless magazine and newspaper articles, television programs, online forums, and chat rooms. Additionally, SST are the focus of numerous recreational fishing tournaments and are the impetus for development of specific lines of fishing tackle, lures, and other fishing related equipment that cater to SST anglers. Over 630,000 saltwater anglers spend an average of 14 days per year targeting SST in Texas waters (Allen & Southwick, 2006). SST fishing accounts for over $487 million in total economic output and supports 4,836 jobs in Texas. Anglers that target SST are also responsible for the generation of nearly $33 million in federal tax revenue and $28 million in state and local revenue (Allen & Southwick, 2006). The viability of this species is critical for saltwater anglers, whose recreational fishing satisfaction is linked with SST populations, as well as the State that receives economic benefits from the anglers who target SST. One population of inshore fishing participants is fully aware of the need to maintain a thriving SST population and particularly sensitive to perceived population declines and resulting displacement.

Inshore Fishing Guides

Despite its economic contribution, the saltwater fishing guide industry (often referred to as the saltwater charter boat industry) did not garner research attention until the mid 1970s (McEachron & Matlock, 1983). Since little information existed about the

charter industry at that time, early research focused on describing various aspects of Texas saltwater charter operators such as: business structure, industry organization, and economic characteristics (Ditton et al., 1978a), industry turnover (Woods & Ditton, 1980), and socio-demographic characteristics and motivations of their angler clientele (Ditton et al., 1978b; Mertens, 1977). Other studies have investigated their usage of offshore artificial reefs (Ditton et al., 1979) and estimated fish harvest among charter boats (McEachron & Matlock, 1983). More recently, studies related to Texas charter operators were incorporated into broader research efforts for the Gulf of Mexico. However, these research efforts were still largely limited to investigating socio-demographic characteristics, understanding industry dynamics, and evaluating economic impacts (Ditton et al., 2001; Ditton & Vize, 1987; Gill et al., 1993; Stoll et al., 2002). Several angler studies have inquired about the frequency with which anglers hire guides in a given year (Anderson & Ditton, 2004; Bohnsack & Ditton, 1999; Tseng et al., 2006) and investigated angler attitudes toward regulations (i.e., boating safety and Cardio Pulmonary Resuscitation (CPR), prohibition of personal fish retention while guiding, and submission to equipment inspection) potentially imposed on saltwater guide operators.

However, despite the research attention fishing guides have received, few studies have sought to exclusively investigate recreational inshore fishing guides as a source of fisheries dependent (i.e., data collected from angler interviews) information. Inshore fishing guides represent a unique angler group within the recreational inshore fishing community whose livelihood is based to some degree on their participation in fishing.

Guides are simply anglers that receive money for taking other anglers fishing and, from a manager's perspective participate no differently than general anglers (Ditton et al., 1978a). Inshore fishing guides provide a fee-based service in which they lead a small number of anglers on fishing excursions. Unlike head boat fishing operators that take large groups of anglers fishing offshore, inshore guides typically accommodate between 3 - 4 anglers in their boat (Ditton et al., 1978a). Inshore fishing guides are hired by anglers based on their perceived ability to provide a particular type of fishing experience (Mertens, 1977). To that end, guides exhibit a range of fishing styles to accommodate a variety of angler motivations, needs, and preferences (Smith et al., 2012). Since guides tend to reflect the preferences of their clients, fishing styles exhibited by guides may be a manifestation of the fishing styles of the general angler population who hire them. Anglers select guides based on their perceived skill, knowledge, experience, and general fishing acumen of inshore waters and the game fish that reside therein (Mertens, 1977; Smith et al., 2012). The lack of research investigating inshore guides as dependent sources of fisheries data is puzzling considering the essential role they play in the Texas recreational inshore fishing community.

Anglers often revere guides and may even adopt the ideologies and viewpoints of these opinion leaders. Due to their fishing expertise, guides are often solicited by media outlets to provide opinions, educational pieces, and fishing reports for consumption by the inshore fishing community. Their up-to-the-minute knowledge of when, where, and how to catch inshore game fish often make them an esteemed group among many anglers. Featured articles and opinions, written by and about guides are staples among

inshore fishing magazines, newspaper articles, radio broadcasts, television programs, and online forums. In addition, some guides have even developed instructional DVDs to teach others how to become more knowledgeable and skilled inshore anglers. The impact of guides on recreational anglers is also evidenced through sponsorships provided to some guides by fishing equipment, tackle, and clothing companies. Much of the effort exerted by anglers, guides, and the inshore fishing industry in general revolves around the guides' intimate knowledge and expertise in fishing for SST.

Since guides are anglers themselves and also serve the general angler population, they have devoted much of their on-water time and energy over the years to the pursuit of SST. Spotted seatrout, along with red drum, are the most sought-after game fish in Texas inshore waters among anglers (Allen & Southwick, 2006). Consequently, SST are the most targeted inshore game fish species among recreational fishing guides along the Texas Gulf Coast (Ditton et al., 1978a; Smith et al., 2012). The focused effort among guides to target SST can be attributed to both the guide's preference for the species and to the popularity of SST among general anglers. This extensive and focused quest affords guides a unique historical perspective to comment on SST population declines. With their livelihood directly linked to SST populations guides may be particularly impacted by SST population declines.

Displacement and Resource Substitution

Displacement is a modification of behavior in response to changes in the recreation environment (Anderson, 1980; Schreyer, 1979). Research has indicated that negative perceptions of the recreation environment influence displacement (Brown &

Anderson, 1984) resulting in a move from an undesirable situation to a more favorable situation (Becker, 1981). Ditton and Sutton (2004, p. 88) expanded displacement to encompass "any change in activities as a result of an inability to negotiate the constraints involved in the primary activity." Displacement may be caused by a variety of social, economic, and environmental constraints such as lack of fishing partners, lack of time, relationships with others, increased costs, newly implemented management regulations, and reduction in fish stock (Ditton & Sutton, 2004). When faced with a constraint, such as perceived reduction in fish stocks, anglers may respond via resource substitution (i.e., engaging in the same activity in another location), recreation substitution (i.e., replace angling with an alternative activity that is equally fulfilling), activity attribute substitution (i.e., changing target species, fishing mode), or cessation of angling altogether (Ditton & Clark, 1995). However, rather than switch activities or cease fishing, displaced anglers will often engage in a form of substitution to overcome constraints and continue their fishing participation (Ditton & Sutton, 2004; Jackson et al., 1993).

Human dimensions researchers have investigated various types of substitution among anglers including: activity substitution (Hendee & Burdge, 1974), resource substitution (Manfredo & Anderson, 1987; Shelby & Vaske, 1991), and species substitution that involves targeting an alternative species (Ditton & Sutton, 2004). Researchers have suggested that angler willingness to substitute is contingent on personal characteristics (e.g., skill level, participation frequency, equipment investment, etc.), motivations, and demographic characteristics such as gender, age, and educational

level (Ditton & Clark, 1995; Driver & Cooksey, 1977; Shelby & Vaske, 1991; Sutton & Ditton, 2005). Recreationists choose substitutes that are similar to the original activity (Ditton & Clark, 1995; Iso-Ahola, 1986; Vaske & Donnelly, 1983). For example, Florida and Texas saltwater anglers were more likely to substitute alternative fishing modes (i.e., fishing from a boat or fishing from shore) that reflected their current fishing mode (Ditton & Clark, 1995). Similarly, substitution of target species among anglers is more likely when the alternative species are available and reflect attributes of the primary target species (Ditton & Clark, 1995). Anglers are also more willing to substitute locations if the alternative setting is similar to the preferred location and does not increase cost and travel distance (Ditton & Clark, 1995; Shelby & Vaske, 1991). However, if the alternative does not provide the same level of satisfaction or benefits as the original it is not a true substitute but rather complimentary choice (Iso-Ahola, 1986; Shelby & Vaske, 1991).

Displacement does not affect all anglers uniformly (Ditton & Clark, 1995) and willingness to substitute is likely related to an angler's particular fishing style. For example, some styles of participation will be impacted to a greater degree due to perceived SST declines due to where they fish (e.g., geographic setting, water depth), how they fish (e.g., fishing method, casting tactic), what they use to fish (e.g., tackle and bait type, and species preference). This perceived or realized impact could lead to a range of displacement behaviors among certain styles of participation. The specialization framework based on contextual styles of participation provides a method of understanding displacement behavior among fishing participants.

Specialization and Styles of Participation

Specialization was conceived as a framework to assist natural resource managers in characterizing diversity among participants in the same activity (Bryan, 1979; Scott & Shafer, 2001a). As an avid fly angler, Bryan (1977, 1979) observed differences among trout anglers in their resource setting and angling preferences based on their years of fishing experience and intensity of involvement. He posited that anglers could be placed "on a continuum from the general to the particular based on equipment and skills used in the sport and activity setting preferences" (Bryan, 1977, p.175). Bryan suggested that this continuum was composed of developmental stages that an angler would naturally progress through over a career. He suggested that these stages could be represented by "ideal types" of anglers that exhibit distinct styles of participation. Styles of participation have been described as a "mix of orientation and behavior that characterize a person's involvement within a given activity" (Scott & Godbey, 1994, p. 276). To that end, Bryan developed a typology of anglers that represented particular styles of participation among trout anglers that included: 1) occasional anglers who were inexperienced and fish infrequently, 2) generalists who were somewhat experienced and used a range of fishing techniques, 3) technique specialists who used specific fishing techniques (e.g., preference for light-tackle only), and 4) technique-setting specialists who were very committed and used specific techniques in particular settings (Bryan, 1977; 1979).

Researchers have sought to conceptualize, characterize, and measure specialization from a variety of perspectives. Contemporary researchers generally agree that specialization is multidimensional and composed of behavioral, skill and

knowledge, and commitment dimensions (McFarlane, 2004; Scott & Shafer, 2001a).

Specialization is regarded as both a developmental process by which participants

become more committed and involved the longer they participate and a range of

orientations and behaviors reflected in characteristic styles of participation (Bryan, 1977;

Scott & Shafer, 2001a). However, specialization as a process evidenced by

developmental stages may not be entirely accurate. Research suggests that, in fact,

participants do not usually progress and that these developmental stages may be better

understood as distinct styles of participation (Kuentzel, 2001; Kuentzel & Heberlein,

2006, 2008; Scott & Godbey, 1994; Scott & Lee, 2010; Scott & Shafer, 2001a).

Additionally, in Bryan's conceptualization of specialization, he relied heavily on

activity context (e.g., preferences for specific bait, equipment, and setting) to

characterize styles of participation among trout anglers. A contextual approach to

understanding specialization in terms of a SOP is attractive for several reasons. First,

contextual styles of participation do not rely on behavioral experience use history or

commitment to characterize anglers. This approach is especially useful for

differentiating a population that appears to be highly specialized such as fishing guides

(Smith & Kyle, 2012). Research also suggests that specialization based on experience

commitment may not accurately reflect styles of participation. For example, some

recreationists who participate regularly and become committed may still exhibit little

evidence of being highly skilled (Scott & Shafer, 2001a). Second, contextual styles of

participation facilitate the discernment of heterogeneity among a highly specialized

population (Smith & Kyle, 2012). A contemporary multidimensional approach that

excludes activity context would likely clump all fishing guides into a single group and be unable to detect distinctions in the perceptions and behaviors that accompany their distinct fishing styles. Third, contextual styles of participation are comprised of activity-specific attributes that reflect elements of the fishing experience that resource agencies can manipulate to provide satisfying, diverse, angling opportunities (Fisher, 1997; Smith & Kyle, 2012). Last, contextual styles of participation can illuminate how closely guide fishing styles are linked with specific resource elements (i.e., fish species, setting preference, water depth, etc.). This may provide insight on which types of guides may experience realized or potential displacement due to perceived declines among SST populations.

Resource Substitution and Specialization among Anglers

Several research efforts have investigated the effect of specialization, or variables typically used to measure specialization, on potential resource substitution decisions among anglers. Previous studies on resource substitution have measured specialization using single items, such as number of days fished in the previous year (Choi et al., 1994), and multiple items such as self-reported skill level, amount of fishing equipment owned, number of days fished in previous year, club membership, and fishing tournament participation (Hyun & Ditton, 2007; Sutton & Ditton, 2005). Researchers have posited that an inverse relationship exists between specialization and substitution (i.e., activity, species, setting, equipment) and as specialization increases participants would become less willing to substitute (Bryan, 1977; Choi et al., 1994; Ditton et al., 1992; Sutton & Ditton, 2005). However, findings suggest the relationship between

specialization and substitution is tenuous and not all specialization attributes follow this reasoning (Choi et al., 1994; Ditton & Sutton, 2004; Sutton & Ditton, 2005). However, inconsistencies regarding the affect of specialization on substitution may lie in the conception and measurement of specialization in these studies. For example, Choi et al. (1994) used a single item (i.e., number of days fished in the previous 12 months) to measure specialization and found the relationship with specialization was weak compared with the impact of social group (i.e., fishing with friends, family) on specialization. Sutton and Ditton (2005), measured individual variables related to specialization (e.g., self-perceived skill level, investment in fishing equipment, frequency of fishing over last 12 months, and importance of fishing compared to other recreation activities) to draw conclusions on the relationship between specialization and substitution. They noted that specialization indicators such as centrality of fishing to other activities, amount of fishing equipment owned, and willingness to substitute an alternative type of fishing (i.e., target switching) did not predict willingness to substitute (Sutton & Ditton, 2005). Characterization of specialization in these studies may not reflect the contextual nature of substitution behavior. Alternatively, SOP provides an approach that is grounded in the activity context of the fishing experience and reflects specific components (e.g., setting, target fish species, fishing method, equipment, etc.) that might be impacted by a substitution decision (Smith et al., 2012). An understanding of SOP would provide insight on substitution behavior by identifying what types of anglers might be impacted, how they might be impact, why they would be impacted, and how they might respond. Despite the advantages of understanding substitution in terms

of contextual styles of participation, no studies to my knowledge have investigated resource substitution among anglers in this manner.

Methods

Data Collection and Analysis

A self-administered survey was provided to all TPWD licensed saltwater fishing guides (n=909). Guides were identified from a list provided by the TPWD license division that included individuals who possessed a current resident or non-resident all-water (i.e., designates saltwater) or paddle-craft guide license. This selection process allowed me to filter out only individuals that were saltwater licensed fishing guides. The survey employed a modified Dillman et al. (2008) approach that included four main steps. First, a personalized letter on university letterhead was sent to all guides in the sample informing them of their selection to participate in my study. The letter also included a brief description of the study and provided an online option to participate immediately or a print option (i.e., hard copy survey packet) that would arrive in approximately two weeks. Access codes located on each letter were required to validate online survey submission. This confirmation prohibited multiple respondent submissions and prevented individuals that were not guides from participating in the survey. Second, all non-respondents (i.e., those who did not complete the online version) were mailed a survey packet that included another personalized letter, survey, and a pre-paid envelope to return their completed survey. Third, a reminder postcard was mailed to all non-respondents one week after the survey packet was mailed. Last, a final survey packet (containing another personalized letter, survey, and return envelope) was mailed two

weeks after the postcard reminder to remaining non-respondents. Data was collected

between April and July of 2011 resulting in 391 useable surveys. The print version

generated 189 surveys and the online version generated 202 surveys. Exclusion of non-

deliverables resulted in a response rate of 46%. Forty-five non-respondents were

contacted to check for non-response bias and asked to answer 10 questions from the

original survey. The questions posed to non-respondents included items such as: "How

would you describe the type of bait used most of the time when you are guiding" and

"How would you describe the fishing method you use most on a guided trip?" No

significant differences were revealed between the survey respondents and the non-

respondents suggesting non-response bias was not an issue.

Self-classification Measure Based on Contextual Styles of Participation

A self-classification measure was developed based on an exploratory

investigation of the social world of inshore fishing guides that spanned the entire Texas

coast (Smith et al., 2012). In-depth, face-to-face interviews were conducted with 18

guides that were selected based on my knowledge of the social world of inshore guides,

geographic location of each guide, other informant's recommendations, their observed

fishing style, and their reputation within the recreational inshore fishing community. My

analysis revealed that respondents characterized SOP within their social world using

activity context. Six activity-specific attributes were primarily used by informants and

included: tackle type, bait type, fishing technique, casting tactic, water depth, and fish

species. Four distinct guide types emerged based on a contextual SOP that included Bait

Guides, All-purpose Guides, Lure Guides, and Sight-casting Guides. My analysis

indicated that contextual attributes were not equally important among guide types.

Consequently, descriptions of my self-classification measure reflect only the most salient

elements of each guide type. To that end, a self-classification measure was developed to

reflect these four general guide types that could be placed on a continuum from least

specialized to most specialized (i.e., Bait Guides, All-purpose Guides, Lure Guides, and

Sight-casting Guides) and were as follows:

1. We typically blind-cast using natural bait from an anchored, occasionally drifting boat. We target several different species (reds, seatrout, black drum, and flounder) of fish depending on which one is biting best.

2. We use a variety of methods to catch fish. We often blind-cast for fish using artificial lures but sometimes use natural bait if needed. We may anchor, drift fish or wade. We typically target seatrout and reds.

3. We typically target big trout in shallow water using artificial lures. We wade fish most of the time but may drift occasionally. We typically blind-cast but may sight-cast to structure or occasional fish.

4. Our main goal is to sight-cast to fish in very shallow water. We mainly flyfish or use light tackle. We often fish from boat but may wade occasionally. We typically catch redfish with a trout or drum on occasion.

Respondents were instructed to select a category that best describes how they

participated while guiding the majority of the time.

My self-classification measure was then used in a subsequent quantitative study

to compare its performance against a multi-item, multidimensional measure of

specialization. My analysis revealed that a single-item, self-classification measure based on a single contextual dimension (i.e., skill, equipment, and resource setting) performed as well as a multi-item, multidimensional measure (i.e., behavior, context, and commitment) (Smith & Kyle, 2012). Performance was determined based on how well the multi-item, multidimensional measure predicted responses to my self-classification measure using discriminant analysis. My findings revealed that 83.7% of cases were classified correctly indicating that my self-classification measure was as useful as a multi-item, multidimensional measure. The performance of my self-classification measure is comparable, or better, than previous research that suggest that self-classification measures perform as well as multi-item, multidimensional measures (See Kerins et al., 2007; Needham et al., 2009; Scott et al., 2005; Sorice et al., 2009).

Self-classification measures are a desirable alternative for researchers and resource agencies, compared to multi-item, multidimensional measures. Self-classification measures are easier to administer, more user-friendly, reduce response burden, allow respondents to classify themselves, and eliminate the need for advanced multivariate statistics (Needham et al., 2009). Self-classification measures also circumvent previously noted issues related to linearity among multi-dimensional measurement (Kuentzel & McDonald, 1992). For example, all specialization dimensions may not increase or decrease in a consistent manner compared to specialization level. Additionally, self-classification measures are ideally suited for representing styles of participation in discrete options for respondent selection.

Perceptions of SST Decline and Associated Displacement Scale

        A scale was developed, based on my analysis of guide responses in the previously described exploratory investigation, to examine displacement caused by perceived SST declines during 2010. Informants revealed that displacement behavior was often manifest in the substitution of geographic setting, alternative fish species, methods, or baits in response to perceived SST population declines. To that end, I developed five indicators to measure displacement behavior. Each statement began with "During the 2010 calendar year, (the) SST population was so low…" and was followed by five separate indicators that represented potential substitution behaviors: 1) *I began to fish in other bay systems*, 2) *I began to target alternative species of fish*, 3) *I began to use other methods or baits to produce a catch*, 4) *I had to travel greater distances to fish for seatrout* and 5) *I noticed more fishing pressure from others in the areas I fish.* Respondents were instructed to rate their level of agreement with each statement on a 5 point scale ranging from 1 (strongly disagree) to 5 (strongly agree). The first indicator, *I began to fish in other bay systems,* was designed to measure substitution of resource setting. It was used to determine if perceptions of SST decline caused guides to fish in alternative bay systems. The second indicator, *I began to target alternative species of fish,* was used to measure if guides had substituted alternative species for SST. The third indicator, *I began to use other methods or baits to produce a catch*, measured substitution of bait type or fishing technique in order to continue to fish for SST. The fourth indicator, *I had to travel greater distances to fish for seatrout,* was used to determine if respondents were required to travel greater distances to find a viable setting

substitute to continue fishing for SST. This represents travel, either transporting boat via trailer to a different access point or by boat on the water, within their usual bay system. The last indicator, *I noticed more fishing pressure from others in the areas I fish* determined if perceptions of crowding in the areas respondents typically fish were due to perceived SST declines among other anglers. Collectively, the five indicators were designed to reveal how perceived SST declines were manifest in displacement behavior among guide types during the 2010 calendar year.

Data Analysis

In order to reveal variation among the self-classification categories (i.e., Bait Guides, All-purpose Guides, Lure Guides, and Sight-casting Guides) with regard to displacement behavior, ANOVAs using least significant differences were conducted. Games-Howell post hoc tests were used for unequal variances (Vaske, 2008). P-values from the Brown-Forsythe test were reported when Levene's test for homogeneity of variances was violated (i.e., $p \leq .05$) (Pallant, 2001).

<div align="center">Findings</div>

Demographic Characteristics

Respondents (n = 370) reported an average age of 52 years and were primarily white (86.9%) with 10.3% claiming Hispanic origin (Table 9). Over 46% indicated that guiding was their primary source of income while 20% reported that they were retired but guided part-time or as their primary source of income. Over 40% of respondents indicated they held an associate's degree or higher and 64% reported they made more than $60,000 per year. Bait Guides (n = 146, 39.4%) and All-purpose guides (n = 158,

42.7%) comprised the two largest groups while Lure Guides (n = 31, 8.4%) and Sight-casting Guides (n = 35, 9.5%) comprised the two smallest groups. The least specialized guide type reported the most total years of guide experience while the most specialized guide type reported the least (i.e., Bait Guides = 14.4 years, All-purpose Guides = 12.4, Lure Guides = 11.4, and Sight-casting Guides = 10.9). Likewise, the number of days spent guiding each year was highest among the least specialized guide type (Bait Guides = 114.9 days) and lowest among the most specialized guide type (Sight-casting Guides = 94.0 days). Mean responses among guide types, for total years guiding experience and number of days guiding each year, contradict previous specialization research that suggests the most specialized types would exhibit the greatest behavioral experience. Sight-casting Guides and Lure Guides made up the two smallest groups, 9.5% and 8.4% respectively, while All-purpose Guides and Bait Guides comprised the largest groups with 39.4% and 42.7% of the sample respectively.

Descriptive Characterization of Self-classification Measure

Response percentages of self-classification categories suggest that certain contextual attributes (i.e., *tackle type, bait type, fishing method, fish species, water depth,* and *casting tactic*) were more salient in characterizing certain guide types than others (Table 10). Based on my exploratory investigation, I suggested each guide type exhibited preferences for specific attributes and the combination of these preferences characterized their SOP.

Table 9 Socio-Demographic Characteristics of Self-classification Categories

Characteristics	Overall	Self-classification Categories			
		Bait	All-purpose	Lure	Sight-Casting
Age in years (*M, SD*)	52.0, 11.5	53.0, 12.7	51.8, 10.5	49.9, 11.2	50.9, 10.1
Gender (%, n)					
Male	98.6, 352	99.3, 137	98.1, 151	96.8, 30	97.1, 33
Female	1.4, 5	.7, 1	1.9, 3	3.2, 1	2.9, 1
Education (%, n)					
High school or less	2.8, 10	3.6, 5	2.6, 4	3.3, 1	0,0
High school graduate	18.2, 65	20.1, 28	20.8, 32	10.0, 3	5.9, 2
Some college	38.3, 137	33.8, 47	43.5, 67	30.0, 9	38.2, 13
Associates degree (2 year)	13.1, 47	12.9, 18	11.0, 17	26.7, 8	11.8, 4
Bachelors degree (4 year)	23.2, 83	25.9, 36	18.2, 28	23.3, 7	35.3, 12
Masters, doctoral, or professional degree	4.5, 16	3.6, 5	3.9, 6	6.7, 2	8.8, 3
Race/Ethnicity (%, n)					
Hispanic	10.3, 37	8.6, 12	10.5, 16	13.3, 4	14.7, 5
White	86.9, 311	86.4, 121	87.6, 134	86.7, 26	85.3, 29
Black or African-American	.6, 2	1.4, 2	0,0	0,0	0,0
Native American or Alaskan Native	2.2, 8	3.6, 5	2.0, 3	0,0	0,0
Asian or Pacific Islander	0,0	0,0	0,0	0,0	0,0
Other	0,0	0,0	0,0	0,0	0,0
Employment (%, n)					
Guiding is my primary source of income	46.5, 167	54.3, 76	39.6, 61	46.7, 14	44.1, 15
I have a full time job and guide part-time	28.4, 102	20.0, 28	34.4, 53	33.3, 10	32.4, 11
I am retired, but guiding is my primary source of income	13.9, 50	18.6, 26	12.3, 19	10.0, 3	5.9, 2
I am retired and work part-time as a guide	6.1, 22	2.9, 4	9.1, 14	3.3, 1	8.8, 3
Other	5.0, 18	4.3, 6	4.5, 7	6.7, 2	8.8, 3
Income (%, n)					
Less than $20,000	3.6, 12	4.6, 6	2.8, 4	3.4, 1	3.1, 1

Table 9 Continued

Characteristics	Overall	Self-classification Categories			
		Bait	All-purpose	Lure	Sight-Casting
$20,000 - $39,000	10.7, 36	13.1, 17	9.0, 13	6.9, 2	12.5, 4
$40,000 - $59,000	20.8, 70	22.3, 29	18.1, 26	27.6, 8	18.8, 6
$60,000 - $79,000	18.5, 62	19.2, 25	21.5, 31	13.8, 4	6.3, 2
$80,000 - $99,000	17.3, 58	15.4, 20	21.5, 31	0,0	21.9, 7
$100,000 - $149,000	19.6, 66	17.7, 23	20.1, 29	20.7, 6	25.0, 8
Over $150,000	9.5, 32	7.7, 10	6.9, 10	27.6, 8	12.5, 4
Total years guiding experience in years (*M, SD*)	13.0, 9.8	14.4, 11.0	12.4, 8.9	11.4, 8.1	10.9, 8.4
Number of days on the water (*M, SD*)	160.0, 68.0	166.2, 64.6	154.7, 71.6	166.3, 66.2	152.7, 66.5
Number of days guiding (*M, SD)*	108.3, 64.4	114.8, 60.9	105.3, 66.9	108.2, 64.7	94.0, 67.0
n (%)	370	146 (39.4)	158 (42.7)	31 (8.4)	35 (9.5)

Table 10 Descriptives of the Contextual Attributes that Comprise Self-classification Categories

Contextual Attributes	Overall	Self-classification Categories (%, n)			
		Bait	All-purpose	Lure	Sight-casting
Targeted fish species while guiding					
SST - 1st choice	65.4, 374	56.8, 83	79.7, 126	87.1, 27	17.1, 6
SST - 2nd choice	24.6, 91	26.7, 39	17.7, 28	9.7, 3	60.0, 21
SST – 3rd choice	7.0, 26	8.9, 13	4.4, 7	0,0	17.1, 6
Red drum – 1st choice	53.8, 199	58.9, 86	46.8, 74	35.5, 11	80, 28
Red drum – 2nd choice	40.8, 151	32.9, 48	50.6, 80	58.1, 18	14.3, 5
Red drum – 3rd choice	4.1, 15	2.7, 4	5.1, 8	9.7, 3	0, 0
Black drum – 1st choice	5.4, 20	9.6, 14	2.5, 4	3.2, 1	2.9, 1
Black drum – 2nd choice	18.6, 69	30.8, 45	12.7, 20	0, 0	11.4, 4
Black drum – 3rd choice	23.8, 88	32.9, 48	17.7, 28	9.7, 3	25.7, 9
Flounder – 1st choice	8.1, 30	7.5, 11	10.1, 16	6.5, 2	2.9, 1
Flounder – 2nd choice	12.1, 45	11.0, 16	14.6, 23	16.1, 5	2.9, 1
Flounder – 3rd choice	31.6, 117	21.2, 31	41.8, 66	38.7, 12	22.9, 8
Fishing method while guiding					
Anchored from boat	38.7, 142	78.5, 113	18.4, 29	0, 0	0, 0
Drifting from boat	31.9, 117	19.4, 28	47.5, 75	12.9, 4	29.4, 34
Trolling motor on boat	4.1, 15	0, 0	8.2, 13	3.2, 1	3.2, 1
Drifting/anchored from a kayak	1.6, 6	1.4, 2	.6, 1	3.2, 1	5.9, 2
Wading	18.8, 69	.69, 1	25.3, 40	80.6, 25	9.7, 3
Poling a skiff	4.9, 18	0, 0	0, 0	0, 0	58.1, 18
Bait type					
Mostly natural bait (crab, shrimp, croaker)	45.9, 169	93.1, 135	20.3, 32	3.2, 1	2.9, 1
Artificial lures and natural bait	26.6, 98	6.2, 9	52.5, 83	12.9, 4	5.9, 2
Mostly artificial lures	23.9, 88	.7, 1	27.2, 43	83.9, 26	52.9, 18
Mostly fly	3.5, 13	0, 0	0, 0	0, 0	38.2, 13
Tackle type (rod and reel)					
Spinning	51.3, 189	66.2, 96	53.2, 84	6.5, 2	20.6, 7
Casting	42.7, 157	33.1, 48	46.8, 74	93.5, 29	17.6, 6

Table 10 Continued

Contextual Attributes	Overall	Self-classification Categories (%, n)			
		Bait	All-purpose	Lure	Sight-casting
Fly or light tackle	6.0, 22	.7, 1	0, 0	0, 0	61.8, 21
Casting tactic					
Blind casting	14.1, 52	17.8, 26	15.2, 24	6.5, 2	0, 0
Blind-casting with some sight-casting	77.0, 285	80.1, 117	81.0, 128	93.5, 29	31.4, 11
Sight-casting to fish	8.9, 33	2.1, 3	3.8, 6	0, 0	68.6, 35
Water depth					
Greater than four feet	21.1, 78	24.1, 35	25.9, 41	6.5, 2	0, 0
Less than four feet	56.9, 210	58.6, 85	60.1, 95	80.6, 25	14.3, 5
Less than two feet	21.9, 81	17.2, 25	13.9, 22	12.9, 4	85.7, 35
n (%)	370	146 (39.4)	158 (42.7)	31 (8.4)	35 (9.5)

The percentage of guides that use particular equipment, prefer particular methods, frequent particular water depths, or target a particular species, support my contextual characterization of each guide type. A review of the descriptive characteristics (n, %) for each indictor, supports my selection of particular attributes to describe each guide type. For example, my characterization of Bait Guides indicated they used natural bait as their preferred *bait type* and anchored from a boat as their preferred *fishing method*. Both natural bait and fishing from an anchored boat were identified by Bait Guides as their most used *bait type* (93.1%) and *fishing method* (78.5%). Therefore, each self-classification category was fleshed out to illustrate attribute importance.

Bait Guides - Ninety-three percent of Bait Guides reported using natural bait most of the time while guiding (Table 10). Over 78% reported fishing from an anchored boat as their primary fishing method with only 19.4% who reported fishing from a drifting boat. Although Bait Guides identified red drum (58.9%) and SST (56.8%) as their first option, they also acknowledged black drum (*Pogonias cromis*) (32.9%) and flounder (*Paralichthys lethostigma*) (21.2%) as suitable third options.

All-purpose Guides – This group used spinning (53.2%) and casting (46.8%) tackle almost equally while blind-casting with some sight-casting to structure or fish (80.1%). The majority of the group (52.5%) used both lures and natural bait. They reported fishing from a drifting boat (47.5%), wading (25.3%), and fishing from an anchored boat (18.4%) as their primary fishing methods. They also identified SST (79.7%) as their first choice of target species and red drum (50.6%) as their second.

Lure Guides – Lure Guides (87.1%) identified SST as their first choice of target

species with over 83% of respondents using artificial lures as their preferred bait type. They reported wading (80.6%) as their primary fishing method with fishing from a drifting boat a distant second (12.9%). The bulk of Lure Guides (93.5%) also reported blind-casting with some sight-casting to structure or fish as their primary casting tactic.

Sight-casting Guides – Responses from this group indicated that most (68.6%) sight-casted to fish in less than two feet of water (85.7%). They preferred using light or fly tackle (61.8%) with artificial lures (52.9%) or flies (38.2%). Fifty-eight percent of this group poled a skiff as their primary fishing method followed by drifting from a boat (29.4%) and wading (9.4%). This group identified red drum (80%) as their first choice of target species and SST (60%) as their second choice.

Displacement Behavior

Overall, one third (n = 122, 33.0%) of respondents indicated that, in the areas they guided, SST had declined dramatically in recent years (Table 11). Nearly 40% of Bait Guides (n = 58, 39.7%) perceived a decline in SST abundance representing the highest percentage of any group. All-purpose Guides represented the lowest proportion with 27% (n = 43) of that group indicating a recent decline.

Nearly 22% (n = 81, 21.9%) of all respondents began to target alternative species of fish due to perceived SST declines in 2010 (Table 12). Additionally, 27% (n = 100) of all respondents acknowledged travelling greater distances to fish for SST due to a perceived decline and over 60% (n = 225, 60.1%) noticed more fishing pressure from others in the areas they normally fish. Bait (n = 22, 51.2%) and All-purpose (n = 24,

15.2%) Guides were the most likely to fish in other bay systems. Bait Guides (n = 42,

28.8%) represented the group that targeted alternative species most often.

Table 11 Perceived Decline in SST Abundance among Self-classification Categories

Perception of Decline Indicator	Overall	Self-classification Category[1] (*n, %*)			
		Bait	All-purpose	Lure	Sight-casting
In the areas I guide SST abundance has declined dramatically in recent years	122, 33.0	58, 39.7	43, 27.2	10, 32.3	11, 31.4
n (%)		146 (39.4)	158 (42.7)	31 (8.4)	35 (9.5)

[1] Reported values for self-classification category represent the number and percentage of respondents that indicated they "agreed" or "strongly agreed" with the displacement behavior indicators.

Table 12 Percent of Respondents that Engaged in Displacement Behavior based on Self-classification Categories

Displacement Behavior Indicators	Overall	Self-classification Category[1] (*n, %*)			
		Bait	All-purpose	Lure	Sight-casting
(During the 2010 calendar year, (the) SST population was so low:)					
I began to fish in other bay systems	55, 14.9	22, 15.1	24, 15.2	4, 12.9	4, 11.4
I began to target alternative species of fish	81, 21.9	42, 28.8	27, 17.1	4, 12.9	7, 20.0
I began to use other methods or baits to produce a catch	66, 17.8	30, 20.5	31, 19.6	3, 9.7	1, 2.9
I had to travel greater distances to fish for seatrout	100, 27.0	44, 30.1	38, 24.1	10, 32.3	7, 20.0
I noticed more fishing pressure from other in the areas I fish	225, 60.8	90, 61.6	98, 62.0	15, 48.4	22, 62.9
n (%)		146 (39.4)	158 (42.7)	31 (8.4)	35 (9.5)

[1] Reported values for self-classification category represent the number and percentage of respondents that indicated they "agreed" or "strongly agreed" with the displacement behavior indicators.

Additionally, Bait (n = 30, 20.5) and All-purpose (n = 31, 19.6%) Guides were the two

groups that exhibited the greatest propensity to substitute methods or baits to catch SST.

Bait (n = 44, 30.1%) and Lure (n = 10, 32.3%) Guides had the highest percentage of

respondents that traveled greater distances to catch SST. Analysis of variance was used to detect significant differences among self-classification categories on five displacement behavior indicators (Table 13). Significant differences existed among self-classification categories for the indicator *I began to target alternative species of fish* ($F = 5.03$, $p = .001$) and *I began to use other methods or baits to produce a catch* ($F = 3.73$, $p = .005$).

Table 13 Differences in Displacement Behavior Responses among Self-classification Categories

Displacement Behavior Indicators	Overall	Self-classification Category[1] (*M, SD*)				F	p
		Bait	All-purpose	Lure	Sight-casting		
(During the 2010 calendar year, (the) SST population was so low:)							
I began to fish in other bay systems	2.09, 1.15	2.21, 1.12	1.99, 1.16	2.07, 1.33	2.09, 1.06	.87	.454
I began to target alternative species of fish	2.29, 1.24	2.59[A], 1.28	2.07[A], 1.20	2.00, 1.17	2.38, 1.10	5.03	.001
I began to use other methods or baits to produce a catch	2.18, 1.11	2.38[A], 1.13	2.16, 1.15	1.90, 1.05	1.76[A], .781	3.73	.005
I had to travel greater distances to fish for seatrout	2.45, 1.28	2.59, 1.26	2.29, 1.27	2.69, 1.51	2.41, 1.13	1.74	.159
I noticed more fishing pressure from other in the areas I fish	3.49, 1.23	3.54, 1.13	3.45, 1.29	3.34, 1.45	3.56, 1.21	.28	.839
n (%)		146 (39.4)	158 (42.7)	31 (8.4)	35 (9.5)		

[1] Reported data for self-classification category represent means. Measured on a 5 point scale ranging from 1 (strongly disagree) to 5 (strongly agree).
Like uppercase superscripts indicate significant difference between categories using LSD Test at 0.05 level or Games Howell. P-values from Brown-Forsythe Test are reported for unequal variances.

Mean responses for Bait Guides (*M* = 2.59, *SD* = 1.28) were significantly higher on the indicator, *I began to target alternative species of fish,* compared to All-purpose Guides (*M* = 2.07, *SD* = 1.20). This suggests that Bait Guides were more likely to

substitute SST for an alternative species than All-purpose Guides during 2010. Also,

Bait Guide mean responses ($M = 2.38$, $SD = 1.13$) to the indicator, *I began to use other*

methods or baits to produce a catch, were also significantly higher than Sight-casting

Guide responses ($M = 1.76$, $SD = .78$). Similarly, results indicated that Bait Guides used

alternative bait types or fishing methods more often than Sight-casting Guides during the

2010 calendar year.

Although, no significant differences were identified among guide types with

respect to *I noticed more fishing pressure from others in the areas I fish,* all four guide

types reported high mean responses: Sight-casting Guides ($M = 3.54$, $SD = 1.13$), Lure

Guides ($M = 3.45$, $SD = 1.29$), All-purpose Guides ($M = 3.45$, $SD = 1.29$), and Bait

Guides ($M = 3.56$, $SD = 1.21$). This suggests that all guide types perceived the increased

crowding in the areas they fished was due to encroachment of others displaced by SST

decline during 2010.

Discussion

The objective of this study was to investigate displacement behavior among

inshore fishing guides based on a contextual styles of participation. Due to a perceived

decline of SST during the 2010 calendar year, significant differences were identified

among self-classification categories on two displacement behaviors: 1) substitution of

target species for an alternative species, and 2) substitution of primarily used bait and

fishing method for an alternative bait or method. The least specialized guide type (Bait

Guides) substituted an alternative species for SST more often than All-purpose Guides

during the 2010 calendar year. Similarly, Bait Guides also indicated substituting bait or

fishing methods for alternatives more often than the most specialized guide group (Sight-casting Guides) during the same time frame. Again, these findings seem reasonable in light of each guide types' contextual SOP and based on previous research related to specialization and substitution (Ditton et al., 1992).

Although Bait Guides may prefer to target SST, the presence and availability of alternative species may facilitate substitution more easily among this group compared to other guide types. My exploratory analysis also indicated, in conjunction with anecdotal data from guides, that perceptions of thriving red and black drum populations, along with recovering flounder populations, provided viable alternatives to SST during the 2010 calendar year. For Bait Guides, producing a catch of SST may be less important than producing a catch of some type. Only 56.8% of Bait Guides identified SST as their first choice of target species compared to 80% of All-purpose Guides (Table 10). Additionally, Bait Guides often divide their fishing effort between a range of target species such as red drum, SST, black drum, and flounder. This divided effort may decrease their interaction with SST leading to more limited knowledge of SST behavior compared to All-purpose Guides.

In contrast, All-purpose Guides primarily target SST as their fist choice and red drum (50.6%) as their second, making the substitution of SST for alternative species (e.g., black drum) less desirable. Additionally, the versatility of All-purpose Guides may enable them to overcome the challenges associated with targeting reduced populations of SST. A product of All-purpose Guides' focused effort to target SST may be the accumulation of a more extensive spatial (e.g., water depth, currents, proven SST fishing

"spots"), temporal (e.g., time of day, season, lunar, and solar cycles), and situational (e.g., the use of certain bait types, fishing methods, casting tactics, and tackle types) knowledge of SST behavior. All-purpose Guides also employ a broader range of fishing methods. While, Bait Guides engage in more passive fishing methods such as fishing from an anchored boat (78.5%), All-purpose Guides reported using a range of fishing methods such fishing from a drifting boat (47.5%), wading (25.3%), or fishing from anchored boat (18.4%). Not surprisingly, the most salient characteristic of All-purpose Guides is their versatility. Their ability to adapt to a wider range of angling circumstances by modifying their use of fishing method or bait type may allow them to catch SST when Bait Guides are less successful. Moreover, successful pursuit of red drum may also assuage reduced SST catch success among All-purpose Guides.

It is not surprising that Sight-casting Guides substituted bait type or fishing method less often compared to Bait Guides. Sight-casting Guides are primarily characterized by their use of light and fly tackle (61.8%) with artificial lures (52.9%) or flies (38.2%) to sight-cast (68.6%) to fish in very shallow water. Although they typically target red drum (80%), the target species of fish is far less important the tackle and bait type used to catch the fish. Sight-casting Guides willingly sight-cast to black drum, flounder, SST, sheepshead (*Archosargus probatocephalus*), and other game fish that may be found in very shallow water (Smith & Kyle, 2012). The process (e.g., skillful use of specific equipment) is far more important than the product (e.g., the type of fish that is caught). Technical mastery of the equipment and employment of sophisticated techniques to hook the fish is the hallmark of highly specialized anglers (Bryan, 1977;

Scott & Shafer, 2001a). Since guides are anglers that take other anglers fishing, the importance of equipment and fishing method are equally important. Conversely, Bait Guides appear to have the least attachment to species type and fishing method of all guide types. Therefore, their adoption of alternative baits and methods to catch SST is reasonable.

Another important consideration in understanding the substitution behavior among guides is the influence of their client. Guides are hired to take other anglers fishing and the willingness of the angler to substitute target species, bait type, or fishing method may dictate the substitution behavior exhibited by guides. Substitution behavior among guide types may be intensified or diminished based on the client's desire to pursue SST and may not solely reflect the guide's personal substitution preference. For example, an angler than is motivated by catch retention and prefers SST as table fare may insist on targeting SST despite the guide's recommendation to target an alternative species. Similarly, anglers interested in fishing for trophy SST may be less willing to make a substitution decision for an alternative species that does not provide equivalent challenge or experiential replacement value (Sutton & Ditton, 2005). Substitution behavior is likely a combination of both the guide's and the angler's willingness to substitute. Therefore, substitution behavior may be a function of the anglers' contextual SOP as well. However, as specialization increases guides may be less willing to modify their contextual SOP to accommodate a client's desires. A guide's resistance to substitution would likely increase if the behavioral modification requested by the angler compromised the most salient contextual elements of a guide's particular SOP.

My research indicates that an actual or perceived decline among SST populations does not impact guide types uniformly. Less specialized guide types were more inclined to modify their SOP by substituting fish species, bait type, or fishing method more than All-purpose Guides and Sight-casting Guides. My results support previous findings on the relationship between substitution and specialization among recreational anglers. Researchers have noted that as specialization increases anglers become more dependent on resource components such preferred size (e.g., trophy-sized fish) or species type and preferences for technique and equipment (Bryan, 1977, 1979; Ditton et al., 1992; Sutton & Ditton, 2005). Research also suggests that less specialized anglers exhibit a greater willingness to substitute than more specialized anglers. I found the same to be true among inshore fishing guides. More specialized guide types such as Lure and Sight-casting Guides were less inclined to make species, fishing method, or bait substitutions compared to a less specialized type such as Bait Guides. Although my findings lend support to previous research, there is a major difference in how I characterized specialization compared to past research. I suggest that the more salient an element is to a contextual SOP the less willing a guide will be to substitute that element. This underscores the fundamental importance of contextual styles of participation in understanding displacement and associated substitution behavior.

Management Implications

Displacement behavior among guides and anglers poses a potentially serious issue for resource managers. Due to perceived or actual decline of a single important species, participants may modify where, with what, and how they fish in order to

overcome constraints. Sustainability of thriving multi-species fisheries may alleviate displacement among some anglers if the opportunity to pursue their preferred target species is constrained through decline or regulation. I would suggest that understanding perceptions of decline and displacement behavior among guides in terms of distinct contextual styles of participation is an attractive approach for resource managers for several reasons. First, the ability to understanding the context (i.e., how, when, with what, and where) of guide fishing styles enables characterization of displacement issues in terms resource managers can modify to create more satisfying solutions. Second, this approach may provide an understanding of why guide groups may react (i.e., embracing or rejecting particular displacement behaviors) to management issues differently. Third, it allows resource managers to predict the impact a declining or regulated fish stock may have on various groups, locations, and alternative populations of game fish.

Limitations

This study had several limitations that should be taken into consideration. I investigated displacement behavior among guide types across the entire coast. Although this provides a general idea of displacement behavior of guides at a State level, managers may be more interested in displacement behavior in each individual bay system. Since SST movement is constrained by distance between Texas' eight major bay systems, actual and perceived SST population declines may vary from one bay system to another. These differences may elicit different displacement behaviors in certain bay systems. Unfortunately, due to the low numbers of responses from highly specialized guide types (e.g., Lure Guides and Sight-casting Guides) in several bay systems, I lacked sufficient

responses from one or both groups to analyze bay systems individually based on guide types. Despite this inability, the patterns of displacement behavior among guide types statewide due to perceptions of SST decline would likely exist among guides in specific bay systems.

Although my guide typology is representative of the entire coast, the physical characteristics of individual bay systems may constrain the presence of certain guide types. For example, only one self-classified Sight-casting Guide was identified from the total number of 56 respondents that recognized Galveston Bay as their primary bay system for fishing. My exploratory study revealed that Sight-casting Guides were constrained in certain areas due in water depth, water turbidity, and presence of "backcountry" (i.e., marshland or barrier islands areas with shallow water) areas. Therefore, not all guide types are found in sufficient numbers to compare their displacement behavior (for all four guide types) in every bay system.

Another limitation of this study is I did not investigate the level of satisfaction among Bait Guides with respect to their substitution decision. Although Bait Guides targeted alternative species and modified their fishing method and bait type, I do not know the impact this substitution decision had on their level of satisfaction. Despite these limitations, understanding displacement and substitution behavior among guides in terms of contextual styles of participation provides insight on how anglers and guides navigate constraints to fishing due to perceived population declines.

Future research should focus on understanding the link between SOP, perceived SST population declines and displacement behavior of individual bay systems. It would

be particularly interesting to investigate the link between perceived and actual declines of SST among guides in each bay system. Strong correlations might indicate that due to their on water avidity and experience, guides provide an important fisheries dependent source of information for managers in monitoring fisheries resources.

CHAPTER V

SUMMARY AND CONCLUSION

I investigated how specialization could be conceived in terms of SOP within the

social world of Texas recreational inshore fishing guides. My study was comprised of

three separate phases that included an exploratory phase (Chapter II), methodological

phase (Chapter III), and an applied phase (Chapter IV). Each phase built upon on the

previous, and was guided by individual research questions and objectives.

Summary

Chapter II outlines my exploratory investigation of how SOP was characterized

within the social world of inshore fishing guides. This chapter also addressed the

relevance of this approach to specialization for characterizing a highly specialized

population such as fishing guides. My investigation revealed that SOP among inshore

guides constitutes a subworld that has coalesced around a set of contextual attributes

used to characterize its members. Six contextual attributes were identified that

contributed to characterization of SOP: *bait type, tackle type, fishing method, casting*

tactic, water depth, and *fish species.* These attributes were considered primary

contributors to the characterization of SOP based on the meanings ascribed by

informants to each attribute. Attribute meaning was created at the subworld level

through social interaction among members and the fishing resource. The salience of an

attribute, or set of attributes, was reflected in the meaning ascribed by informants and

was ultimately manifested in distinct styles of participation. Four guide types emerged

from my analysis based on contextual SOP and included: *Bait Guides*, *All-purpose Guides*, *Lure Guides,* and *Sight-casting guides*. These guide types could be placed along a continuum from least specialized guide type (*Bait Guide*) to most specialized (*Sight-casting Guide*).

My findings support previous research (Bryan, 1977; Ditton et al., 1992; Kerins et al., 2007; Scott & Godbey, 1994) that has identified the fundamental role of social worlds, and their associated subworlds, in the development and understanding of specialization and SOP. However, unlike previous studies (See Kerins et al., 2007; Scott & Godbey, 1994) that have used multidimensional approaches (i.e., behavioral experience, desire to develop or self-reported skill and knowledge, and commitment) for characterizing SOP, I used a single contextual dimension (i.e., skill, equipment, and resource setting). My contextual approach does not diminish the role of behavioral experience or commitment in characterization of SOP among general populations. Rather, my contextual approach was likely a reflection of a highly specialized population that exhibits high levels of behavioral experience, skill and knowledge, and commitment. Among this population, contextual attributes provided a more meaningful approach for characterizing SOP. Additionally, my typology was based on similar contextual preferences (e.g., preference for equipment, technique, and setting) used by Bryan to differentiate his most specialized angler types (e.g., technique specialist and technique/setting specialist).

In Chapter III, I developed and explored the efficacy of a single-item measure of specialization using contextual styles of participation. Additionally, I explored the

contribution of behavioral experience and commitment for revealing heterogeneity among guides. To that end, I compared my single-item, unidimensional (i.e., skill, equipment, and resource setting) measure of specialization based on contextual SOP against two multi-item measures: 1) a multi-item, multidimensional measure (i.e., behavior, context, and commitment), and 2) a multi-item single dimensional measure (i.e., skill, equipment, and resource setting). My findings suggest that, based on discriminant analysis, that the multidimensional measure predicted 83.7% of the self-classification cases correctly. Similarly, the unidimensional measure predicted 84.0% of the self-classification cases correctly. The high classification rate, based on previous research results (See Kerins et al., 2007; Needham et al., 2009; Scott et al., 2005) of the multidimensional measure suggests that a single-item measure based exclusively on contextual attributes performed as well as a multidimensional measure. Additionally, the high-classification of the unidimensional measure suggested that commitment and behavior offer little assistance in revealing heterogeneity among my population of highly specialized inshore fishing guides.

My findings from Chapter III support the efficacy of using a single-item self-classification measure of specialization, compared to a multidimensional measure, in general and SOP in particular (See Kerins et al., 2007; Needham et al., 2009; Scott et al., 2005; Sorice et al., 2009). However, unlike previous studies, my self-classification measure conceived specialization in terms of contextual attributes alone. The performance of my self-classification measure suggests the contribution of the commitment and behavioral experience dimensions may be limited among inshore

fishing guides. My findings also underscored the importance of using contextual attributes for characterization of SOP among this population.

In Chapter IV, I applied findings from the research conducted in the two previous phases (i.e., Chapter II and III). Specifically, I investigated displacement behavior among Texas inshore fishing guides due to perceived SST decline during 2010 using my contextual self-classification measure of specialization. In so doing, I investigated variation in resource substitution (i.e., substitution of setting, target fish species, and bait and method type) behavior among guide types due to perceived SST declines. My findings indicted that least specialized guide types (i.e., Bait Guides) substituted an alternative species for SST due to perceived SST declines more often than specialized guide types (i.e., All-Purpose Guides). Similarly, I found that Bait Guides also substituted bait type or fishing method for alternatives due to perceived SST decline, more than the most specialized guide type (i.e., Sight-casting Guides). My findings support previous research that posited less specialized anglers would be more willing to substitute than more specialized anglers (Ditton et al., 1992). Similarly, more specialized guide types are more dependent on resource components and exhibited stronger preferences for species type, fishing method, and bait type. Additionally, displacement does not affect anglers uniformly and substitution behavior is related to SOP. The more salient a contextual attribute is to a particular SOP, the less likely an angler would be to substitute that particular attribute for an alternative. Again, this underscores the importance of understanding activity context attributes and their associated meaning.

General Conclusions

Symbolic interactionism provided a useful theoretical perspective for

understanding specialization in terms of SOP. Symbolic interactionism suggests that

behavior is the result of interpretations of meaning ascribed to objects (e.g., attributes)

formed during social interaction. The meanings informants ascribed to various attributes

formed the foundation for understanding how they engaged in the activity of fishing.

The importance of these socially constructed meanings, and their salience to informants,

characterized SOP among inshore fishing guides. Symbolic interactionism facilitated the

identification of which attributes were most significant for characterizing SOP.

Collectively, my investigations revealed that activity context held the most

meaning among informants. These contextual attributes were primary descriptors used

by informants to characterize SOP within their social world. Different attributes were

ascribed different meanings by informants and these differences resulted in distinct

styles of participation. These styles of participation could be placed along a continuum

from the least specialized guide type to the most specialized guide type. As

specialization increases dependency on most salient contextual attributes of a particular

SOP increases. This revelation was evident in displacement behavior among guides with

respect to perceived SST decline in 2010. For example, least specialized guide types

(i.e., Bait Guides) substituted bait type and fishing method more often than the most

specialized guide type (i.e., Sight-casting Guides). These attributes held less meaning for

less specialized guide types and was reflected in their substitution behavior. They were

more concerned with catching SST and less concerned by the means used to accomplish

the task. Alternatively, the most specialized guide type was highly dependent on these attributes and was more concerned with the manner in which the fish were pursued than the actual type of fish targeted. In sum, contextual SOP provides an alternative approach for understanding heterogeneity among a highly specialized population.

Limitations

One of the limitations of my investigation was that my contextual characterization of SOP, and subsequent typology, was tailored for Texas inshore fishing guides. Although this typology may be translate well to other Gulf Coast states (e.g., Louisiana, Alabama, Mississippi), with similar resource characteristics (e.g., setting, fish species, etc.) it would likely fail to translate well in other locales. For example, my typology does not reflect the game fish diversity, habitat diversity, and cultural preferences found in Florida inshore fisheries. This limitation would be even more pronounced in other geographic regions. My characterization of SOP and typology development was the result of extensive field work conducted in an exploratory investigation that resulted in a customized typology. Although the actual typology may not transcend location or activities, the contextual approach and methodology would translate to other geographic areas and nature-based activities.

My contextual approach for characterizing SOP among inshore fishing guides may also be less useful in other activities. For example, other leisure pursuits have studied specialization in terms of SOP among Contract Bridge players. Contextual attribute preferences (i.e., where the game occurs, the type of table used, etc.) may not play an essential role in characterizing SOP among Contract Bridge players.

Additionally, the extensive exploratory effort that preceded the development of my contextual SOP might be too costly for some research efforts. Financial and temporal constraints might preclude this approach from being a viable option.

<div align="center">Significance of Research</div>

My research has provided a small contribution to understanding the specialization construct from both a conceptual and programmatic perspective. Conceptually, my characterization of SOP represented one of the few attempts to understand specialization exclusively in terms of activity context. This characterization represented a return to the tenets of Bryan's conceptualization of specialization that has been lacking in contemporary measurements. My research also underscored the importance of qualitatively investigating the salience of elements that comprise SOP. The naturalistic approach I employed in my exploratory investigation provided an insider's perspective leading to the development of SOP and associated guide typology. This may not have been possible otherwise. My findings suggested that meanings formed the foundation of SOP characterization and were integral in understanding how participants engage in an activity. My research also contributed to an understanding of specialization among highly specialized subpopulations. My findings suggested that, among highly specialized populations, experiential behavior and commitment may be unable to differentiate a population that is highly committed and expresses extensive experiential behavior. Among my highly specialized population of inshore guides, activity context was found to be the most discriminating factor.

From an application perspective, understanding SOP in terms of activity context

provides fisheries managers a management approach based on elements of the fishing experience they can manipulate. This potentially provides fisheries managers a more attractive tool for quantifying percentages of anglers that participate in particular manner, predicting trends, understanding associated displacement behavior, and providing fishing experiences that meet varied needs. My study supported previous research that indicated a self-classification measure of specialization based on SOP performed as well as multidimensional measures. This provides fisheries managers a more user-friendly approach for data collection compared to the employment of multidimensional measures. Self-classification measures are easier to administer, reduce response burden, and eliminate the need for advanced multivariate analyses. Since guides are anglers, my research could be extended to the wider inshore fishing community. Even though only a small percentage of anglers may be highly specialized, they are not a homogeneous group. They are comprised of angler types that express distinct styles of participation with diverse motivations, ideologies, and desired outcomes. Additionally, highly specialized anglers tend to be more mobilized, involved, and perhaps demanding of management resources.

Further research should be conducted to understand the importance of activity context in characterizing participation in other nature-based activities. Understanding this dimension may prove practical for researchers and resource managers alike.

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APPENDIX A

INTERVIEW GUIDE

INTERVIEW GUIDE FOR TEXAS INSHORE FISHING GUIDE INFORMANTS

1. How many years have you been guiding? Which bays do you consider your home waters?
2. How many days are you on the water per year (fish, scout)? What species do you typically target?
3. Why do some anglers become fishing guides and most other anglers don't? Why did you become a fishing guide? How did you learn to guide? Who taught you?
4. How has fishing and boating equipment changed since you began guiding?
5. What are some positive impacts this has had on recreational fishing (shallow skiffs, kayaks)? Negative?
6. How has information technology changed recreational fishing? (Things like cell phone, internet, GPS, chatrooms,) What positive impacts has this had on fishing guides? Which technology has had the biggest impact on recreational fishing?
7. How would you classify the different types of inshore fishing guides in your home water?
8. What things do you look for in order to differentiate between these types or groups?
9. Based on the description you gave, how would you describe your fishing style to a potential client?
10. Why do you think some guides focus on a particular type of guiding?
11. How do you spot a fishing guide on the water? What things indicate the type of fishing guide someone might be?
12. Often guides are categorized into different user groups : fly guide, lure, guide, kayak guide, bait guide… Do these user groups have competing interest? Does it divide the fishing community?
13. Since there is no formal education or certification process to become a guide, how did you learn acceptable fishing/boating behavior?
14. What causes the most conflict between users while on the water? How do you handle conflict?
15. In general, what are some things that determine the type of fishing technique you use/fish a client on a given day (weather, technique)?
16. Since you became a fishing guide do you view fishing as work? Do you still go fishing in your free time?
17. Is it more enjoyable to catch a fish or guide someone to catch a fish?
18. How would you describe the behavior of general anglers in the bays you guide? What causes this?
19. How would you describe the abundance and quality of redfish and trout populations? How has it changed since you began guiding? What is the biggest threat to the trout fishery? Red drum fishery?
20. When and where are trout most vulnerable to recreational fishing?
21. What is your opinion on catch and release?

22. How would you describe the different types of client you have and how would you classify them?
23. How would you describe the overall habitat condition of the bays you fish? What do you believe are the causes of habitat degradation?
24. How would you change the current recreational fishing regulations?
25. What are the biggest issues facing the guide industry and what is the future of guiding?
26. What are your perceptions of tournament angling and how has it impacted guides or the resource?
27. What is your opinion of limited use zoning and would you support implementation? What type?

APPENDIX B

CONSENT FORM

CONSENT FORM FOR INFORMANT INTERVIEWS

You have been invited to participate in research investigating social and natural resource perceptions of Texas inshore fishing guides. The study, conducted by Bill Smith of the Recreation, Parks & Tourism Sciences at Texas A&M University, seeks to gain insight from guides about their "world", the guide industry in general and their perceptions of natural resource conditions along the Texas coast. You were selected as one of fifteen fishing guides to participate in this study.

If you agree to participate, you will be asked to be audio taped during the 30-45 minute interview. You may refuse to answer questions, request to have to recorder turned off or statement removed and may withdraw at any time without penalty.

This study is confidential and your name will not be used unless you indicate your preference otherwise. This entire study will last for one and one half years during which time the research records will be securely stored and kept completely private. Upon completion of the research any recordings will be destroyed. The risk of participating in this study is no more than experienced in daily life.

There is no compensation for participating in this research however, your participation will further our understanding of Texas inshore guide industry and associated natural resources. This research has been reviewed by the Institutional Review Board (IRB) for human subjects in research through Texas A&M University. If you have questions or concerns about your rights as a research participant, please contact this organization at irb@tamu.edu or call 979-458-4067. Alternatively, you can contact Bill Smith (wesmith@tamu.edu) or 979-492-7484 with any questions about this research.

Please be sure you have read the above information and clarified any questions you might have. You will be given a copy of this information sheet for your records.

I agree to be audio taped _____Yes _____ No
I want my real name used with recording or publications_____Yes _____ No

_____ Date _____
Signature of participant
_____ Date _____
Signature of investigator

APPENDIX C

PHONE SCRIPT FOR PARTICIPATION SOLICITATION

PHONE SCRIPT TO PARTICIPANT SOLICITATION

P = Potential Participant, I = Interviewer

I-	Howdy, may I please speak with (potential participant)?

P-	Howdy, this is (potential participant). How may I help you?

I-	My name is Bill Smith and I am a Ph.D. student in the Department of Recreation, Park & Tourism Sciences at Texas A&M University. I am conducting a study to understand the world of Texas inshore fishing guides and perceptions of the guide industry and associated natural resources. Is this a good time to visit with you about this study?

P-	No, thank you (agree on time to call person back)

or

P-	Yes, could you give me more information?

I-	This research seeks to gain insight from guides about their "world", the guide industry in general and their perceptions of fisheries resource conditions along the Texas coast. I will be conducting interviews beginning (date). The interview would last about 45 minutes at a time and location convenient for you. Your involvement is voluntary and you may decline to answer questions or terminate the interview at any time. With your permission, the interview will be recorded so it may be transcribed later. The collected data will be stored in a secure location for one and one half years and will be destroyed at the end of the research study. This study has been cleared by Texas A&M University's Institutional Review Board for human subjects. Would you be willing to participate in this study?

P-	No thank you.

or

P-	Sure, I would like to participate.

I-	(Get contact information from participant). Thank you very much for agreeing to participate. May I call you in a few days to schedule a time and location for the interview? If you have any questions you can contact me at 979-492-7484. Thanks again and I will speak with you soon.

P-	Okay. Good-bye.

I-	Good-bye.

APPENDIX D

SURVEY INSTRUMENT

Texas Saltwater Fishing Guide Survey

Research conducted by:

TEXAS A&M UNIVERSITY

Human Dimensions of Natural Resources Lab

College Station, TX

ACCESS CODE: XXXX

SECTION A: General guiding information

1. How many years have you been a fishing guide? (If less than 1, write 1)

   Part-time _____ years   Full-time_____ years

2. How many days are you **on the water guiding** anglers in a typical year?

   _____ days

3. How many **total days** are you on the water in a typical year (Guiding, scouting, personal fishing, etc.)?

   _____ days

4. Are you primarily an inshore fishing guide (bays and coastal waters) or offshore fishing guide?
   ☐ Inshore (if you selected "Inshore" skip to question 6)
   ☐ Offshore

5. Do you guide any inshore (bays and coastal waters) fishing trips during a typical year?
   ☐ Yes
   ☐ No, I guide offshore exclusively (If "No", skip to page 11 Section D)

6. Which species of fish do you prefer to **target when guiding**? (You may write more than one letter in each blank).

   _____ First choice

   _____ Second choice (If you have a 2nd choice)

   _____ Third choice (If you have a 3rd choice)

   A. Seatrout   B. Red drum   D. Black drum   E. Flounder   G. Other _____

7. Which bay systems do you guide in **most of the time**? (You may check more than one)
   ☐ Sabine Lake   ☐ Aransas Bay
   ☐ Galveston Bay   ☐ Corpus Christi Bay
   ☐ Matagorda Bay   ☐ Upper Laguna Madre
   ☐ San Antonio Bay   ☐ Lower Laguna Madre

8. If you **had to select ONE bay system** you guide in most of the time which would it be?
(Please select only one).

☐ Sabine Lake   ☐ Aransas Bay
☐ Galveston Bay   ☐ Corpus Christi Bay
☐ Matagorda Bay   ☐ Upper Laguna Madre
☐ San Antonio Bay   ☐ Lower Laguna Madre

9. How do you access coastal waters **most of the time** when guiding fishing trips?
(Please select only one)

☐ Bay boat
☐ Airboat
☐ Kayak
☐ Shallow water boat
☐ Poling skiff
☐ Shore or walk-in
☐ Other (Please specify) _____

10. How would you describe the fishing **method you use most** on a guided trip?
(Please select only one)

☐ Drifting from boat
☐ Anchored from boat
☐ Poling a skiff
☐ Drifting/anchored from a kayak
☐ Trolling motor on a boat
☐ Wading
☐ From shore
☐ Other (Please specify) _____

11. How would you describe the type of bait used **most of the time** when you are guiding?
(Please select only one)

☐ Mostly natural bait (crab, shrimp, croaker, etc.)
☐ Artificial lures and natural bait
☐ Mostly artificial lures
☐ Mostly fly
☐ Other (Please specify) _____

12. Which type of tackle (rod & reel) is **primarily used** on your guided fishing trips?
(Please select only one)
- [ ] Spinning
- [ ] Casting
- [ ] Fly or light tackle
- [ ] Other (Please specify) _____

13. On a guided trip which of these casting tactics are **used most of the time**?
(Please select only one)
- [ ] Blind casting
- [ ] Blind casting with some sight-casting to structure or fish
- [ ] Sight-casting to fish

14. In what depth of water do you **guide the majority of the time**? (Please select only one)
- [ ] Less than two feet
- [ ] Less than four feet
- [ ] Greater than four feet

15. How many guide, fishing or conservation organizations do you belong?

_____ Number of organizations

16. How many of each type of boat do you own and use for guiding?
_____ Bay boat
_____ Airboat
_____ Kayak
_____ Shallow water boat
_____ Poling skiff
_____ Other (Please specify) _____

17. How much **would it cost** (general estimate) **to replace** the following items you own?
_____ Reels
_____ Rods
_____ Tackle
_____ Electronics
_____ Boats and trailers
_____ Other (Please specify) _____

17a. What percentage of your guide business is repeat customers each year? _____%

---

18. Although your fishing style on a guided trip may vary depending on weather, season of the year or the skill/desire of your client, which of the following **best describes your fishing style the majority of the time**? (Please check only one)

☐	We typically blind cast using natural bait from an anchored or occasionally drifting boat. We fish for several different species of fish (reds, seatrout, black drum and flounder) depending on which one is biting best.
☐	We use a variety of methods to catch fish. We often blind cast for fish using artificial lures but sometimes use natural bait if needed. We may anchor, drift fish or wade. We typically target seatrout and reds.
☐	We typically target big trout in shallow water using artificial lures. We wade fish most of the time but may drift occasionally. We typically blind cast but may sight cast to structure or occasional fish.
☐	Our main goal is to sight-cast to fish in very shallow water. We mainly flyfish or use light tackle. We often fish from a boat but may wade occasionally. We typically catch redfish with a trout or drum on occasion.

---

19. Please rate your level of agreement with the following statements (*Please circle one number for each statement*)	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
a) When I am guiding I consider fishing as work	1	2	3	4	5
b) I still love to go fishing with friends and family in my free time	1	2	3	4	5
c) I would rather participate in activities other than fishing in my free time	1	2	3	4	5
d) I get more enjoyment guiding someone to catch a fish than catching one myself	1	2	3	4	5
e) My desire to fish is fulfilled through guiding others	1	2	3	4	5
f) I guide so much I don't enjoy fishing as a recreational activity any longer	1	2	3	4	5
g) My clients are typically highly skilled anglers	1	2	3	4	5
h) I often get to fish with my clients	1	2	3	4	5

i)	When I am guiding I consider myself a "teacher"	1	2	3	4	5
j)	I would rather guide than do any other activity for my income	1	2	3	4	5
k)	Guiding is just a job for me	1	2	3	4	5
l)	Guiding is not only a job but a way of life for me	1	2	3	4	5

SECTION B: Your opinion and attitudes toward coastal fishing issues.

20. Please rate your level of agreement with the following statements toward **Spotted seatrout** (*Circle one number for each statement*)

In the areas I guide (the) spotted seatrout:

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
a)	abundance has declined dramatically in recent years	1	2	3	4	5
b)	population is so low the last few years we rarely catch a limit	1	2	3	4	5
c)	population is lower than creel surveys report	1	2	3	4	5
d)	population is lower than gill net surveys report	1	2	3	4	5
e)	of legal size has declined in abundance over the recent years	1	2	3	4	5
f)	of oversized or "trophy" size has declined in abundance in recent years	1	2	3	4	5
g)	bag limit should be lowered	1	2	3	4	5
h)	minimum length should be increased	1	2	3	4	5
i)	bag limit should be reduced to 5	1	2	3	4	5
j)	bag limit should only be reduced if the bag limit for redfish was increased	1	2	3	4	5
k)	will rebound on their own and no action is needed	1	2	3	4	5
		1	2	3	4	5
During the **2010** calendar year, (the) **spotted seatrout population was so low** …						
l)	I began to fish in other bay systems	1	2	3	4	5
m)	I began to target alternative species of fish	1	2	3	4	5
n)	I began to use other methods or baits to produce a catch	1	2	3	4	5
o)	I had to travel greater distances to fish for seatrout	1	2	3	4	5
p)	I noticed more fishing pressure from others in the areas I fish	1	2	3	4	5

21. Please rate your level of agreement with the following statements about **user conflict.** This refers to conflict among users based on fishing styles such as kayakers, wadefishers, airboaters, flyfishers, etc. (*Circle one number for each statement*)	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
In the areas I guide user conflict:					
a) is a current or growing problem	1	2	3	4	5
b) is mainly due to a lack of boating or fishing etiquette	1	2	3	4	5
c) often occurs because of crowded conditions (e.g. weekends)	1	2	3	4	5
d) often occurs because of different types of fishing /boating methods in the same area	1	2	3	4	5
e) occurs because some user groups are territorial	1	2	3	4	5
f) is due to inexperienced or novice boaters/anglers	1	2	3	4	5
g) is due to the fact some people are just rude or inconsiderate	1	2	3	4	5
h) often occurs because anglers perceive certain types of fishing/boating scare fish away	1	2	3	4	5
i) could be reduced by etiquette education	1	2	3	4	5
j) could be reduced by enforcing current boating and fishing regulations	1	2	3	4	5

22. Please rate your level of agreement with the following statements about **fish disturbance in shallow water** (*Circle one number for each statement*)	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
In the areas I guide:					
a) running boats along shorelines looking for fish is a common occurrence	1	2	3	4	5
b) running boats in shallow water has minimal, short-term impact on fish	1	2	3	4	5
c) boating along shorelines is a useful technique for locating fish	1	2	3	4	5
d) fish disturbed from boating often return to normal activity within minutes	1	2	3	4	5
e) continued disturbance may lead to a permanent change in	1	2	3	4	5

	fish behavior					
f)	fish disturbance is just part of fishing and the fish will adjust	1	2	3	4	5
g)	I have witnessed shallow-water boats being used to "round-up" fish	1	2	3	4	5
h)	greater boater/angler education is needed to limit fish disturbance and prevent harassment	1	2	3	4	5
i)	greater enforcement of current laws are need to prevent fish harassment	1	2	3	4	5

23. Please rate your level of agreement with the following statements (*Circle one number for each statement*)	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Advances in boating, equipment and information technology:					
a) have given anglers too much of an advantage over fish	1	2	3	4	5
b) have allowed too much access to shallow water areas that can't absorb increased use	1	2	3	4	5
c) have robbed participants of the full appreciation of gradually learning the where, when, why and how of catching fish	1	2	3	4	5
d) have been mostly **positive** – it is the irresponsible use of technology that has been detrimental to guiding and fishing	1	2	3	4	5
e) has been mostly **negative** – it has created a culture that is dependent on technology in order to navigate, find and catch fish	1	2	3	4	5
When I am guiding:					
a) I encourage clients to practice catch and release	1	2	3	4	5
b) I encourage clients to keep smaller legal fish and release larger legal fish	1	2	3	4	5
c) we are more likely to release a legal redfish than a legal trout	1	2	3	4	5
d) a full limit is the best indicator of a good fishing trip	1	2	3	4	5
e) a fishing trip can be successful even if no fish are kept	1	2	3	4	5
f) catching a limit is a major goal	1	2	3	4	5
g) we keep more fish than I would if I were fishing for myself	1	2	3	4	5

h)	I would lose clients if I didn't keep all the legal fish we catch	1	2	3	4	5
i)	it's my clients right to keep his limit and I shouldn't give my opinion	1	2	3	4	5
j)	we keep every fish we are legally entitled to	1	2	3	4	5

Some groups have proposed the creation of **low impact fishing areas (LIFA)** to help conserve habitat and reduce user conflict. For the purposes of the following questions a low impact fishing area (LIFA) is defined as a fishing area that prohibits the use of a combustion engine for propulsion within its borders.

With regard to low impact fishing areas:

a)	I believe LIFAs are elitist and unfairly exclude certain types of users	1	2	3	4	5
b)	It is just a way to create private fishing areas for certain users	1	2	3	4	5
c)	May be an effective way to reduce conflict among multiple user types	1	2	3	4	5
d)	I would support creation of a LIFA that prohibits use a combustion engine	1	2	3	4	5
e)	I would only support LIFAs that protect the environment and not for provision of specific types of fishing	1	2	3	4	5
f)	I would support the creation of a LIFA on an experimental basis to assess impacts on the environment, fish behavior and user satisfaction	1	2	3	4	5
g)	I would oppose the creation of any type of LIFA	1	2	3	4	5
h)	I may support some type of LIFA depending on the area and circumstances	1	2	3	4	5
i)	Creation of LIFAs might lead to overregulation or limitation of freedom	1	2	3	4	5

SECTION C: Importance of Fishing

24. Please rate your level of agreement with the following statements (*Circle one number for each statement*)	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
a) If I stopped fishing, an important part of my life would be missing	1	2	3	4	5

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b)	I would rather go fishing than do almost anything else	1	2	3	4	5
c)	Participation in fishing is a large part of my life	1	2	3	4	5
d)	Most other recreation activities do not interest me as much as fishing	1	2	3	4	5
e)	Fishing is becoming a more central part of my life each year	1	2	3	4	5
f)	Given the fishing skills I have developed, it is important that I continue to participate in fishing	1	2	3	4	5
g)	I feel that I am more skilled in fishing than other anglers in general	1	2	3	4	5
h)	Testing my fishing skills is very important to me	1	2	3	4	5
i)	In general, I am becoming more skilled at fishing each year	1	2	3	4	5
j)	I have accumulated a lot of fishing equipment	1	2	3	4	5
k)	I have invested a lot of money in fishing equipment	1	2	3	4	5
l)	I feel that I have more fishing equipment than other anglers in general	1	2	3	4	5
m)	I often spend time learning about the newest fishing equipment available	1	2	3	4	5
n)	In general, I am obtaining more fishing equipment each year	1	2	3	4	5

25.		Beginner	Novice	Intermediate	Advanced	Expert
Which of the following best describe your fishing skill level:		1	2	3	4	5

26. Which of the following **best describes how you feel about your personal fishing expertise**? (Please check only one)

☐	Type I: "Fishing is an enjoyable, but infrequent activity that is incidental to other travel and outdoor interests. I am not highly skilled in fishing, rarely read fishing articles, and do not own much fishing equipment beyond the basic necessities."
☐	Type II: "Fishing is an important, but not exclusive outdoor activity. I occasionally read fishing articles and purchase additional equipment to aid in fishing, my participation in fishing is inconsistent, and I am moderately skilled in fishing."
☐	Type III: "Fishing is my primary outdoor activity. I purchase ever-increasing amounts of equipment to aid in fishing, go fishing every chance that I get, consider myself to be highly skilled in fishing, and frequently read fishing articles."

SECTION D: Household Information
Your answers are strictly confidential

27. What year were you born?   _____

28. What is your gender?   ☐ Male   ☐ Female

29. Which of the following indicates your level of education? (*Check one*)
    ☐High school or less
    ☐High school graduate
    ☐Some college
    ☐Associates degree (2 year)
    ☐Bachelors degree (4 year)
    ☐Masters, Doctoral, or Professional Degree

30. Which of the following best describes your employment status? (*Check one*)
    ☐Guiding is my primary source of income
    ☐I have a full time job and work part-time as a guide
    ☐I am retired but guiding is now my primary source of income
    ☐I am retired and work part-time as a guide
    ☐Other (Please specify) _____

31. Please tell us which of the following best indicates your race or ethnic group?

    Ethnicity   *Race*
    ☐Hispanic   ☐Black or African-American
    ☐White, not of Hispanic origin   ☐Native American or Alaskan Native
                                                ☐Asian or Pacific Islander
                                                ☐Other (Please specify)

32. Which of the following best describes your household income before taxes? (*Check one*)
    ☐Less than $20,000
    ☐$20,000 - $39,999
    ☐$40,000 - $59,999
    ☐$60,000 - $79,999
    ☐$79,000 - $99,999
    ☐$100,000 - $149,999
    ☐Over $150,000

33. Please use this area below to tell us about anything else you feel is important for our survey.

_____

_____

_____

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_____

Thank you for completing this questionnaire. We appreciate you taking the time to share your thoughts. Please insert the survey in the enclosed postage-paid envelope and return.

If you have any questions please contact William Smith at wesmith@tamu.edu or 979-492-7484.

APPENDIX E

INVITATION LETTER

AgriLIFE RESEARCH
& EXTENSION
Texas A&M System

TEXAS A&M
UNIVERSITY

COLLEGE OF AGRICULTURE
AND LIFE SCIENCES
RECREATION, PARK AND TOURISM SCIENCES
Human Dimensions of Natural Resources Lab

April 6, 2011

Howdy Captain Jones,

You have been invited to participate in research investigating the opinions of Texas saltwater fishing guides. This study, conducted by researchers at Texas A&M University, seeks to gain insight from guides about their various fishing styles and investigate their opinions on several coastal fishing issues including: shallow water boating behavior, spotted seatrout populations, user conflict, low impact fishing areas and support for associated regulations and/or management actions.

This investigation is the second phase of an ongoing study of Texas saltwater fishing guides. Phase one involved personal interviews with a number of guides from the upper, middle and lower Texas coast in the summer and fall of 2010 to identify issues of concern among guides. Now we are seeking the input of all licensed saltwater fishing guides in Texas. As a licensed saltwater fishing guide, your expertise and on-water experience are recognized by general anglers and natural resource agencies as a valuable source of recreational fishing information. Your opinion is very important and the aggregate results of this study will be shared with the Coastal Fisheries Division of the Texas Parks & Wildlife Department. Your participation is voluntary but will provide managers valuable insight on a range of issues.

To access the survey online, please go to: **http://www.guidesurvey.info**
You will need to enter the following access code when you begin the survey. Access Code: **1111**

If you are unable to complete the online survey within 10 days, you will receive a hardcopy survey in the mail. The questionnaire will take approximately 25 minutes to complete. This study is confidential and your responses will remain anonymous. Only aggregated responses will be documented in our final report. This research has been reviewed by the Institutional Review Board (IRB) for human subjects in research at Texas A&M University. If you have questions or concerns about your rights as a research participant, please contact this organization at irb@tamu.edu or call 979-458-4067. If you have any questions regarding this survey, please contact William Smith (wesmith@tamu.edu) or 979-492-7484.

We appreciate and value your time and opinion,

William Smith
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