SOCIAL SUPPORT INTERACTIONS IN THERAPEUTIC ADVENTURE EDUCATION PROGRAMS

by

JEFFREY SCOTT TURNER

(Under the Direction of Gwynn Powell)

ABSTRACT

Social interactions in adventure programs are considered paramount for individual growth, yet little empirical evidence is available to support this assumption. Less is known about the types of social interactions that encourage growth. This study explored the impact of social support structures on course outcomes of an adventure therapy program as measured by the Youth Outcome Questionnaire (Y-OQ). Participants provided information on four types of social support they received from other group members throughout the program. Findings indicated the development of high levels of social support within the adventure therapy program groups. The global measure of social support was not able to predict the therapeutic growth as measured by the Y-OQ or its subscales. Examination of the four specific types of social support indicated that high levels of Instrumental Support predicted greater overall therapeutic growth and that each of the four types of social support predicted one or more the Y-OQ subscales.

INDEX WORDS: Adventure recreation, Adventure education, Adventure therapy, Outward Bound process, Social networks

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DEDICATION

It is my honor to dedicate this dissertation to my wife Stephanie and my son Will. Both have born the pressure of this work as much as I have. It has only been through their support, patience, and love that I have completed this project.

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Chapter 1

Introduction

Adventure recreation pursuits can be used as a vehicle for educational growth through a phenomenon known as adventure education (Priest, 1986). The historical development of adventure education stems back centuries with the greatest growth beginning in the 1940s with the development of Outward Bound in the United Kingdom (Raiola & O'Keefe, 1999). While originally conceived of as a tool for personal growth (Sakoffs, 1988), adventure education practices have been spun off into therapeutic applications as well. Such adventure therapy programs use adventure recreation pursuits as one aspect of the therapeutic milieu.

While many different types of adventure education programs exist, all are based at least in part on the traditional Outward Bound model. Outward Bound is an educational program based on William James' idea of creating a "moral equivalent to war" (Hunt, 1999). James issued a challenge to find a way to provide the same opportunities for interpersonal and intrapersonal growth that he saw in military veterans without the repugnance of war (James, 1949). Outward Bound was founded in response to this challenge in Britain in the 1940s and came to America in 1962 (Raiola & O'Keefe, 1999).

Walsh and Golins (1976) developed the Outward Bound Process model in an attempt to describe how adventure education programs lead to interpersonal and intrapersonal growth. They suggest that an adventure program's efficacy lies in placing the learner in a combination of novel physical, task, and social environments. This combination of setting characteristics creates a state of dissonance for the learner who slowly gains a sense of achievement that can then be transferred to the real world for long-term behavioral change.

An expanding literature has developed to support the overall effectiveness of adventure education and therapy programs (see for reviews Hattie, Marsh, Neill, & Richards, 1997; Neill, 2003). However, the model has been critiqued as atheoretical by some due to a lack of reflections on assumptions in the model (McKenzie, 2000, 2003). Recent work has attempted to provide empirical backing for (Sibthorp, 2003a) and theoretical development of aspects of (Goldenberg, McAvoy & Klenosky, 2005; McKenzie, 2003) the model. Ewert's insistence over two decades ago that "we have discovered an educational black box, we know something works but we don't know why or how" (1983, p. 27) is just as relevant today.

Purpose of the Study

In order to begin to unravel the mystery of the "black box", this study seeks to better understand the role of the social environment in the adventure education experience by examining the potential impact of social networks on program outcomes. Ewert and McAvoy (2000) comment that "the group dynamics, group interaction and group development that happen during group experiences tend to influence most of the potential and documented benefits" (p. 22) of adventure programs. Kimball and Bacon (1993) posit that "because personality is formed and shaped largely through our contact and involvement with others, it can be reshaped through this same intimate contact" (p. 22). Thus, a nuanced understanding of how different social interactions and structures lead to different levels of outcomes is critical for providing adventure experiences that maximize the potential for participant growth. Such a perspective would provide adventure education practitioners with a heightened awareness of how to best structure group experiences to provide optimal experiences.

Research Questions

Through the application of social networks methods to understanding the social nature of the adventure education program, this research will attempt to answer the following questions:

1. What participant characteristics are associated with social interactions between participants?
2. Is there a relationship between a participant's social networks and his or her adventure program outcomes?
3. If a relationship exists between participant's networks and his or her program outcomes, what characteristics of participant's social networks lead to increased program efficacy for individual participants?
4. How are changes in participant's social networks over the adventure education experience related to program efficacy for individual participants?

Delimitations

A review of the current adventure education literature indicates the great variety in program length, client, location, and program outcomes. While adventure education programs vary greatly in length, between as little as a day-long or over a year-long program, the current study has selected a program of 21 days. Additionally, the studied program uses a closed-system model in which participant groups remain together throughout the length of the experience in comparison to continuous-flow systems in which participants regularly join and depart groups. The selected program has a therapeutic focus, indicating a different level of engagement than more general adventure education programs. The selected adventure program utilizes a combination of base camp and backcountry experiences that substantively differ from wilderness therapy programs that use less impacted natural areas. Finally, the participants of the studied program have various psychological diagnoses that could effect their social interaction patterns in a way much differently than the interactions between participants without such dysfunction.

Definition of Terms

Adventure Recreation: “a variety of self-initiated activities utilizing an interaction with the natural environment, that contain elements of real or apparent danger, in which the outcome, while uncertain, can be influenced by the participant and circumstance” (Ewert, 1989, p. 7).

Adventure Education: “programs, involving outdoor pursuits, have traditionally concentrated on the interpersonal and intrapersonal relationships…through overcoming wilderness challenges” (Priest, 1984, p. 14).

Adventure Therapy: "programming aimed at changing [specified] dysfunctional behavior patterns, using adventure experiences as forms of habilitation and rehabilitation" (Priest & Gass, 1997, p. 24).

Homophily: the tendency for individuals to interact more with others who are more like themselves (see McPherson, Smith-Lovin, and Cook, 2001, for a thorough review).

Social Networks: “a distinct research perspective within the social and behavioral sciences…based on an assumption of the importance of relationships among interacting units” (Wasserman & Faust, 1994, p. 4)

Chapter 2

Literature Review

The following literature review is compromised of two primary content areas. First, an overview of the adventure experience situates the scholarship of adventure and is followed by sections further exploring adventure recreation, adventure education, and adventure therapy. Each of these sections provides an overview of the concepts and traces classical and contemporary trends in empirical research and theoretical model development. The second part of the literature review provides a synopsis of social network theory and methods. A general overview of social networks is followed by a review of the limited use of social networks in recreation and leisure studies. Finally, a short primer on network representation provides a guide to prominence measures within networks.

The Adventure Experience

The related concepts of adventure recreation, adventure education, and adventure therapy are utilized within a variety of discourses distinguished by academic discipline. Historically, little crossover between disciplines such as education, psychology, and recreation and leisure studies has led to divergent approaches to understanding experiences labeled as "adventure." While such disciplinary focus might be seen as beneficial due to the myriad ways in which adventure experiences are studied, much could be improved through shared theoretical concepts useful in understanding why people participate in such activities and what outcomes they experience from such participation.

Understanding of adventure activities within recreation and leisure has typically been grounded within the broader outdoor recreation literature and often coincides with aspects of risk

recreation and wilderness recreation. Such scholarship has traditionally approached the study of adventure experiences from a perspective that focuses on individuals participating on their own in such experiences, until recently to the exclusion of "programmed" experiences. Such an emphasis on the individual can be seen in one popular definition that portrays adventure recreation as "a variety of self-initiated activities utilizing an interaction with the natural environment, that contain elements of real or apparent danger, in which the outcome, while uncertain, can be influenced by the participant and circumstance (Ewert, 1989, p. 7). Recently, scholars have focused increasingly on programmed aspects of adventure recreation, including programmed adventure recreation that has goals beyond simply providing opportunities for leisure experiences. Such benefits-based work has focused on outcomes as varied as resiliency (Green, Kleiber, & Tarrant, 2000), self-efficacy (Sibthorp, 2003), and "communitas" (Sharpe, 2005).

Conversely, scholarship from various educational and psychological disciplines (especially the theoretical tradition of experiential learning) has attempted to explore how adventure recreation activities can be used in educational, developmental, and therapeutic applications. From such perspectives, adventure recreation pursuits are used as a learning tool and are not seen as an end in themselves. While risk is certainly inherent in the activities used by adventure educators, it has been argued that "it is not the activity per se that is central to the experience" (Loynes, 1998, p. 37). Early scholarship from this area focused on what outcomes could be achieved through the use of adventure activities (Hattie, Marsh, Neill, & Richards, 1997), while more recent work has attempted to understand the process by which such learning occurs (e.g. Goldenberg, McAvoy, & Klenosky, 2005; Martin & Leberman, 2005; McKenzie, 2000, 2003).

Adventure recreation.

Ewert has defined adventure recreation as "a variety of self-initiated activities utilizing an interaction with the natural environment, that contain elements of real or apparent danger, in which the outcome, while uncertain, can be influenced by the participant and circumstance" (1989, p. 7). Ewert's definition focuses on several important aspects that distinguish adventure recreation from other types of recreation: 1) the natural physical setting, 2) the inherent risk involved in the activity and 3) the ability of the recreator to "influence" the outcome (*id est* not to serve simply as a spectator). While other leisure pursuits may incorporate some of these aspects, the combination of these three is what makes adventure recreation unique.

The published research on adventure recreation has developed over three overlapping generations. The earliest literature on adventure recreation explored why people participate in adventure recreation (circa 1980s-early 1990s). A second generation of research focuses on the psychological experience of adventure recreation (circa 1990s). The third generation is more sociological (or at least social psychological) in that it focuses on the meanings that are created through participation in adventure recreation as well as highlighting the social context within which adventure recreation activities are situated (circa late 1990s-early 2000s). While there is certainly some foundational work prior to the early 1980s and a few specific studies that don't fit neatly into the categories or time periods offered above, the scholarship of adventure recreation has certainly evolved as scholars continue to develop deeper levels of understanding.

Studies on why people participated in adventure activities dominated the adventure recreation literature throughout the late 1980s and early 1990s. Most studies went beyond simple measures of perceived freedom or intrinsic-nature of recreator's experiences. Some studies focused on individual attributes (e.g. motivations, previous experiences, or personality traits

(Ewert, 1985; McFarlane, Boxall, & Watson, 1998), while others emphasized aspects of the activity or physical setting (Heywood, 1987; Mitchell, 1983; Schreyer & Beaulieu, 1986).

Mitchell (1983) suggested that mountaineers participated in the way they did in order to achieve a state of flow. Mitchell argued that the need to experience flow comes from a response to the polarized sociological states of anomie and alienation under which individuals live. These two states indicated a lived experience rife with absolute structural uncertainty and certainty, respectively, in response to which individuals would seek experiences that would be under their control. Adventure activities met a need for individuals to experience a level of challenge that met their personal competence, thus escaping the extremes of anomie and alienation.

Ewert and Hollenhorst (1989, 1994) combined for the first time individual and activity/setting factors to predict engagement for adventure recreators in the "Adventure Model." McIntyre (1992) and Schuett (1993) each sought to reconceptualize engagement through the Adventure Model. Priest (1992) integrated the combined aspects of the adventure recreation participation model into his Adventure Experience Paradigm (Martin & Priest, 1986-described more fully below) in order to further understand the role of psychological perceptions of risk and competence in participation in adventure activities.

The continued development of the Adventure Model was not able to explain why people were initially drawn to adventure. The work of Robinson (1992) and Creyer, Ross, & Evers (2003) both sought to further explain motivation in understanding the sociopsychological needs that "push" people into participating (Mannell & Kleiber, 1997). Robinson's (1992) model built on Ewert & Hollenhorst's (1989) early work by placing greater emphasis on adventure recreation's "uncertain and potentially harmful nature" (p. 53) and the psychological processes that influence continued involvement in such activities. Robinson suggests that various psychosocial needs influence attraction to risky activities. These needs are based in part on

personality traits (need for stimulation and autonomy) and societal traits (need for uncertainty in an otherwise routinized world). Creyer et al. (2003) first looked at the effect that individual's previous experience with an adventure recreation activity had on anticipated outcomes for participation, perceived risk, and general appeal of the activity. Their model attempted to explain not only why adventure recreators do what they do, but also why large numbers of people do not participate in this type of leisure activity.

While the earliest literature tried to understand why people participated in adventure recreation, the second generation of adventure recreation literature begins to offer a greater understanding of leisure as experienced through adventure pursuits. Early work in this area explored the concept of perceived risk and competence. Cheron and Ritchie (1982) examined risk across 20 leisure activities (including one high-risk activity) and had two "dimensions" of risk emerge (psychosocial and functional/physical) and found that levels of each dimension varied substantially across activities. McIntyre and Roggenbuck (1998) explored the multi-phasic nature of adventure recreation participation and found that perceptions of risk changed not only across activities, but also throughout a singular experience. Interestingly though, they found that perceptions of competence did not change significantly throughout the experience.

Many scholars have attempted to apply the foundational concepts of optimal arousal (Ellis, 1973) and flow (Csikszentmihalyi, 1975) to better understand the nature of risk and competence in the adventure recreation experience. Martin and Priest (1986)[1] developed the Adventure Experience Paradigm using optimal arousal, flow, and Mortlock's (1987) stages of an adventure experience. "The adventure experience is a function of individual risk inherent in a setting (situationally specific) and a function of individual competence (personally specific)"

[1] See also Carpenter & Priest (1989) for an application of the adventure experience paradigm to non-risk recreation activities. This is one of the few, if not only, examples of a theory developed specifically to understand adventure recreation being used to explain general leisure experiences.

(Carpenter & Priest, 1989, 67). When an individual balances actual risk and competence, peak adventure is experienced. If actual competence is greater than or much greater than actual risk, adventure or exploration and experimentation is experienced, respectively. If actual risk is greater than or much greater than actual competence, misadventure or devastation and disaster is experienced, respectively. Also important for understanding the adventure experience is the perception of risk and competence. "Fearless and arrogant" individuals under perceive the risk and over perceive their competence for a given experience most likely resulting in devastation and disaster. "Timid and fearful" individuals over perceive the risk and under perceive competence, most likely resulting in experimentation and exploration. Neither situation is desirable as neither is likely to experience peak adventure.

Priest (1992) attempted to integrate his Adventure Experience Paradigm model (Martin & Priest, 1986) with the adventure recreation participation model of Ewert and Hollenhorst (1989). In further exploring the concepts of risk and competence, Priest uncovered three factors related to risk (fear of risk, risk eustress, and risk distress) and two factors related to competence (attitudes and abilities). Priest suggests integrating these into the Adventure Model as predictors of participation in adventure recreation activities. The most recent exploration of optimal experience constructs in the adventure experience was by Jones, Hollenhorst, & Perna (2003), who compared the Adventure Experience Paradigm to the Four Channel Flow Model and found them equally effective at predicting flow experiences.

The third generation of adventure recreation research focused on the meanings made and the outcomes experienced from adventure recreation experiences. Some scholars attempted to expand our understanding of the adventure experience beyond that of wealthy, white males who were the initial focus of early adventure recreation studies.

Pohl, Borrie, & Patterson (2000) interviewed 24 women with moderate to great experience with wilderness-based recreation to explore how their wilderness experiences impacted their lives. Pohl, et al., posited that characteristics of the wilderness and the recreation experience (e.g. challenge, simplicity, and a connection to nature) in conjunction with other contributing factors (e.g. physical competence and support from others) led to four primary transferable outcomes (self-sufficiency, changes in perspective, connection to others, and mental clarity) which ultimately lead to changes in the women's everyday lives. While supporting much of the previous literature on wilderness experiences, the authors also suggest that wilderness recreation can help women break down prescribed gender roles and provide opportunities to interact with others in ways that are not normally possible.

Iso-Ahola, LaVerde, & Graefe (1988) explored the impact of adventure recreation participation on the recreator's self-esteem. Specifically, they hypothesized that increases in self-esteem from participating in adventure recreation activities would be mediated by the individual's perceived competence. Their study of rock climbers found that neither general perceived competence with climbing nor previous climbing experience effected self-esteem, but that specific perceived competence from the day's climbing could indicate increases in self-esteem. These findings suggest a dynamic nature of self-esteem more readily influenced by recent events than by long-term experiences and the power of adventure recreation activities to be used for personal development.

Loeffler (2004) used a photo elicitation study to explore the meaning-making of college students who participated in a college adventure recreation experience. Students were asked to explain the reasons why they took the pictures they did and how each picture represented the experience. Three themes developed from the author's analysis. First, the students suggested a "spiritual connection" with the natural environment in which the experience took place. Second,

the students spoke about the relationships they developed with others through the experience. Third, the students spoke of the personal growth that they experienced through participating in the adventure recreation experience.

Finally, the initial signs of a fourth generation of research have emerged in the last three years focusing to a greater extent than before on the role of programmed adventure recreation. Earlier scholarship focused on individual experiences (e.g. Ewert & Hollenhorst, 1994) did not account for the impact of the guide or instructor (e.g. Schuett, 1993; McIntyre & Roggenbuck, 1998), and in some cases mixed individual recreators and participants in programs or classes without distinction (McIntyre, 1992). The recent trend has been to examine multiple aspects of the adventure recreation programmer or participant. Sharpe (2005) and Beedie (2003) provide ethnographical accounts of the role that wilderness trip leaders and mountain guides, respectively, play in creating the adventure recreation experience, while Kane and Zink (2004) explored a packaged whitewater kayaking tour as a marker of serious leisure despite the programmed aspect. Culp's (1998) study of constraints for adolescent girls participating in outdoor recreation (not necessarily adventure recreation) activities suggested that program philosophy, structure of program activities, and the gender composition of program groups each influence the extent to which adolescent girls will participate in recreational activities.

Adventure education.

Adventure education programs use adventure recreation pursuits to help participants better understand their relationships with themselves and with others (Priest, 1986). This focus on personal growth is what separates seemingly similar adventure education programs from adventure recreation programs. In adventure education, adventure recreation pursuits are used as a learning tool and are not seen as an end in themselves.

There is a large amount of published research on the outcomes of adventure programs using the Outward Bound Process. Three meta-analyses have attempted to consolidate the breadth of such outcome studies.

Cason and Gillis (1994) reviewed studies on adolescents and found an average effect size of 0.31 across 43 studies. Specific outcomes were found to have effect sizes as low as 0.302 (for locus of control) and as high as 1.047 (for clinical scales). Additionally, longer program durations and older participants were positively correlated with effect sizes, while higher quality research designs were negatively coordinated with effect sizes.

Hattie et al.'s (1997) meta-analysis of adventure education program outcomes reviewed 96 studies and found an overall effect size of 0.34 at program termination with an additional increase in effect size of 0.17 from termination to follow-up indicating continued growth following the adventure education program. Hattie et al. found no difference in effect sizes based on the quality of the research design, the type of participant (normal, delinquent, or management), gender composition of the group (male only, female only, or mixed gender), but effect sizes were greater for older participants and for programs over 20 days in length. Forty major outcomes were subdivided into one of six categories (effect sizes at program termination/follow up): self-concept (0.28/0.23), personality (0.37/0.14), leadership (0.38/0.15), interpersonal (0.32/0.17), adventuresome (0.38/-0.06), or academic (0.46/0.21).

Hans (2000) developed a meta-analysis of locus of control outcomes for adventure education programs. An overall effect size of 0.38 was determined for 24 studies compared to an effect size of 0.30 found by both Cason and Gillis (1994) and Hattie et al. (1997). Only two variables were found to moderate the changes in locus of control: program goal (recreation, educational, adjunctive therapy, primary therapy) and daily duration (pure residential, mixture of residential and outpatient, pure outpatient).

More recently, researchers have turned from a focus on program outcome measurement to an exploration of how such outcomes are realized. While several scholars have attempted to distill the existing literature to better understand how varying program components effect course outcomes, no one has been able to explain why these components have the effects they do. Nevertheless, it's important to examine each component in Walsh and Golins (1976) model individually.

Participant characteristics play a large role in the outcomes experienced from an adventure education program. Previous research has looked at both the effects of demographic variables and psychosocial characteristics (Sibthorp, 2003a). It has generally been supported that men and women do have different types of experiences and outcomes of adventure education programs (e.g. Ewert, 1988, Little, 2002; Propst & Koesler, 1998). Older participants also tend to benefit more from adventure education experiences (Hattie et al., 1997). Borstelman (1977 as cited in Ewert & McAvoy, 2000) suggest that much of the reported benefits of participation in Outward Bound programs may be due in large part to internal motivations, or a "readiness to change". While this certainly causes concern when analyzing outcome data (Ewert & McAvoy, 2000), it emphasizes the importance of investigating internal motivations. Recent work to further explore the role of such antecedent variables and found that while they are not linked to program outcomes, they are in fact linked the participant's perceptions of the experience (Sibthorp, 2003a).

While Walsh and Golins (1976) suggest a novel physical environment, the implication is that it is novel in the form of a wilderness environment. While some Outward Bound programs do use urban environments (Proudman, 1999), most do in fact seek out wilderness environments despite a lack of support for the primacy of wilderness environments (Miles, 1999). Walsh and Golins (1976) suggest the selection of natural environments provides multiple benefits in that

they are highly stimulating to course participants, they provide natural as opposed to arbitrary consequences,[2] and they provide opportunities for "straightforward" tasks that support mastery. White and Hendee (2000) suggest a "primal hypothesis" of wilderness interaction in which the naturalness and solitude of wilderness were found to support the development of self, development of community, and spiritual development across three separate wilderness experience programs.

While many different adventure recreation activities (such as backpacking, rock climbing, whitewater canoeing/kayaking, and challenge courses) are used in adventure education programs, little is known about the benefit of the different activities used. Consistent throughout the literature is an emphasis on the risk/competence balance as developed by Martin and Priest's (1986) Adventure Experience Paradigm. Finding the order in which to developmentally sequence activities to achieve this correct balance for groups is seen as critical (Bisson, 1999). Ewert and McAvoy (2000) suggest that adventure experiences "work to build groups as long as the trip is not too long, too stressful or too demanding" (p. 18). While risk is certainly inherent in the activities used by adventure educators, it has been argued that "it is not the activity per se that is central to the experience" (Loynes, 1998, p. 37) and that the most important risks are those involved with personal development (Nichols, 2000). While several authors have critiqued the overall conception of "risk as negative" and attempted to reframe the discussion around the benefits of risk (Cline, 2001; Welch, 2004), others have challenged the use of risk completely (Berman & Davis-Berman, 2005; Davis-Berman & Berman, 2002).

MacKenzie (2003) expanded Walsh and Golins (1976) conception of course activities beyond problem-solving tasks" (although all of their examples of such "tasks" included some aspect of adventure recreation activities). MacKenzie's (2003) exploration of how specific

[2] Recent support for the importance of natural consequences comes from Sibthorp (2003b) who found that the authentic nature of the learning experience led to increases of transfer of course learning.

course components lead to course outcomes found that other types of course activities such as solos and service projects greatly influenced course outcomes. Further research by Bobilya, Kalisch and McAvoy (2004, 2005) explored the role of participant characteristics, the environment, and the course instructor on student perceptions of their solo experience.

Ewert and McAvoy (2000) commented that "the group dynamics, group interaction and group development that happen during group experiences tend to influence most of the potential and documented benefits" (p. 22) of adventure programs. Kimball and Bacon (1993) posit that "because personality is formed and shaped largely through our contact and involvement with others, it can be reshaped through this same intimate contact" (p. 22). Thus understanding how different social interactions and structures lead to different levels of outcomes is critical. Walsh and Golins (1976) suggest that a "ten-group" is most effective for reaching program outcomes. Approximately ten people is optimal for three reasons: 1) it is large enough for a diversity of personalities, but small enough that cliques will not form; 2) it large enough for conflict, but small enough to deal effectively with the conflict; and 3) it is large enough that a "collective consciousness" can form.

One of the more widely studied aspects of adventure education is the facilitation of learning conducted by course staff. Bacon (1987) suggested three models of facilitation that have evolved over the life of Outward Bound. Initially, the Mountains Speak for Themselves (MST) model dominated in that course instructors did not actively direct learning through the experience, simply letting the course participants interpret their own learning. Second, an Outward Bound Plus (OBP) model developed through which course instructors helped students reflect on their experiences to better learn from them. Finally, a Metaphoric Model (MM) developed through which course instructors facilitate the learning, both before and during the experience through the development and use of metaphors. Doherty (1995) tested the efficacy of

each facilitation style with multiple groups during a one-day challenge course program and found greater outcomes in groups that were facilitated using the MM over the MST or OBP models.

In addition to the facilitation style used (which may be either a function of the instructor or the program philosophy), other characteristics of the instructor prove to be important in understanding the adventure education experience. While addressed by Walsh and Golins (1976), the role of the instructor was not officially a part of the Outward Bound Process model. They suggest that the instructor serves the role of translator of learning, initiator of experiences, trainer of skills, and modeler of the characteristics that students are working to develop. MacKenzie's (2003) later revision of the Outward Bound Process model dictated that instructor personality, expectations of student behaviors, feedback to students, and serving as role models all helped to improve specific course outcomes.

Adventure therapy.

Gillis and Ringer (1999) define adventure therapy as "the deliberate, strategic combination of adventure activities with therapeutic change processes with the goal of making lasting changes in the lives of participants" (p. 29). Gass (1993) suggested that at least three main types of programs are used to achieve such therapeutic change. First, wilderness therapy programs tend to utilize mid- to long-term expeditions in wilderness-like areas with small groups of clients. Residential camping uses long-term interaction with the natural environment interspersed with short adventure activities to initiate change. Finally, adventure-based therapy is often associated with treatment centers and tend to focus on short-term exposures to adventure activities such as challenge-courses.

Various clients of adventure therapy programs have been studied to better understand the impact that such programs can have. These clients include the sexually abused (Ross, 2003;

McBride & Korell, 2005), adolescents with behavioral problems (Long, 2001; Autry, 2001, Berman & Anton, 1988), those with sexual behavior problems (Longo, 2004), physically abused women (Powch, 1994), juvenile offenders (Clagett, 1989; Jones, Lowe, & Risler, 2004) and substance abusers (Gillis & Simpson, 1991; Russell, 2005)).

Multiple outcomes for adventure therapy programs have been explored (Russell, Hendee, & Phillips-Miller, 2000). These include the development of self-concept (e.g. self-efficacy [Davis-Berman & Berman, 1989], self-concept [Marsh, Richards & Barnes, 1986], locus of control [Berman & Anton, 1988; Davis-Berman & Berman, 1989]), knowledge and skills (e.g. life skills [Moote & Wodarski, 1997], problem-solving skills [Wichmann, 1991]), realizations to change behavior (psychological problems [Clark et al., 2004; Russell, 2001], asocial behaviors [Wichmann, 1991], recidivism [Clagett, 1989; Jones, Lowe, & Risler, 2004], and alienation [Cross, 2002]), and strengthened family relations (Strengthen the sense of family and increase awareness of family strengths [Bandoroff, 2003]).

Above and beyond the basic factors that influence the effectiveness of all adventure education programs, several studies have examined what makes adventure therapy most effective. Several scholars have emphasized the healing role of nature in the therapeutic process (Beringer, 2004; Beringer & Martin, 2003; Williams, 2000). Wichmann (1991) found that both instructor experience and instructor expectations for participant behavior both played a part in reducing antisocial behaviors.

Conclusion.

The study of adventure experiences from the disciplines of leisure studies and education seem to have more in common than they do that differentiate them. In most cases, concepts are freely passed across disciplines to better explain such phenomenon. Indicative of this is the growing number of scholars who are publishing in both disciplines. While much remains to

understand about the adventure experience, it seems likely that both disciplines will be necessary to understand it fully.

While the adventure recreation literature has evolved over the past 25 years, there is still much to be learned. Topics that have lain somewhat dormant for close to a decade have recently been revived (e.g. adventure recreation participation models [Creyer et al., 2003]). Additionally, as the new Millennial generation comes of age, many of the initial theorizing on adventure recreation participation will need to be reworked to determine if there are any generational differences in views on adventure recreation participation and the meaning taken from such experiences (Watters, 2006).

Multiple calls have been made to better understand the exact process by which learning occurs through both adventure education and adventure therapy programs (Ewert & McAvoy, 2000; MacKenzie, 2003; Sibthorp, 2003a). Additional work must be done to better understand what course components (activities, settings, curriculum) lead to such learning and how this learning is then transferred to situations outside of the adventure experience (Sibthrop, 2003b). Finally, while outcomes for traditional adventure education programs are well understood (Hattie et al., 1997), greater emphasis must be placed to continually assess outcomes for different populations served by adventure therapy programs.

While the challenges of conducting research on adventure recreation, education, and therapy are fully detailed (Ewert & McAvoy, 2000), much further research can and will be done to further our understanding of these phenomenon. Within the current political climate that privileges “true” experimental research designs and denigrates all others, an increased research savvy must be used to ensure the continued flow of grant funding to further research on adventure programming. Furthermore, scholars studying adventure programming should beware the dangers of navel-gazing, and begin to write for audiences outside of the general adventure

programming community. The implementation of peer review from outside the adventure programming community will serve to not only further inform the general population about the benefits of adventure programs, but will also serve to improve the overall rigor applied to adventure programming research that in the long run will provide a more thorough understanding of the adventure experience.

Social Networks

Most current research in recreation and leisure studies utilizes a psychological or sociological framework; although the research labeled as sociological has at best attempted analysis based on the roles of individuals in small groups. Mayhew (1980, 1981) and others argue that the individual as unit of analysis has little explanatory power and that most social phenomenon are better explained with more parsimonious, structural arguments. Social network analysis differs from traditional types of social science in that it seeks to explain social phenomena through the connections between groups or individuals instead of through descriptive variables of the groups or individuals themselves. Thus, the existence and nature of ties between two entities and the network patterns that form from these ties serve as the units of analysis in social network research. Examples of network connections include economic trade between nations (Smith & White, 1988), memberships on boards of directors (Burt, 1978/79), marital ties between families (Padgett, 1987), email through professional list serves (Freeman & Freeman, 1979), co-sponsorship of legislation (Fowler, 2006), or simply nominations of personal friends and advisors (Coleman, Katz & Menzel, 1957).[3]

[3] I have chosen to follow as closely as possible the terminology and notation used by Wasserman and Faust (1994) to compensate for the various ways in which similar terms are used quite differently in the disciplines in which network methods are employed.

Social networks in recreation and leisure studies.

While social network methodology is not completely absent from recreation and leisure research, it is very rare. Most studies that do discuss networks simply apply aspects of network theory (such as social capital) to more traditional psychological or sociological analyses (Arai & Pedlar, 1997; Gahwiler & Havitz, 1998; Glover, 2004; Hibbler & Shinew, 2002), while those that fully embrace network methods are few enough that they can be discussed in turn. Stowkowski and Lee (1991) studied the impact of social networks on recreation patterns in a small, western town and found a correlation between communal ties and recreation ties. Specifically, they found that women tended to recreate with close family members or community members who they interacted with throughout their daily routine while men tended to recreate with extended kin and friends in set aside leisure activities. Harshaw and Tindall (2005) looked at respondent's range of strong and weak network ties to determine their impact on the respondent's diversity of forest values. Their analysis suggested that individual's diversity of ties to others with varying relationships to forests leads the individual to have a diversity of identities related to the forest resources, which in turn results in a diversity of values related to forest resources. Warde, Tampubolon, and Savage (2005) used social network analysis to explore the leisure habits of members of three voluntary associations. Specifically, they explored with whom the respondents visited, dined or drank with socially and the relationships the respondents had with these alters. Their analysis suggested that homophily had little to do with whom the respondents interacted, but that the differences in individuals network structures (e.g. range of ties and network size) and the characteristics of ties (e.g. frequency of interaction and how long the tie has existed) do greatly influence their participation in specific recreation activities.

Social network representation.

Social networks can be measured in multiple ways. The characteristics of different measurement types are important theoretical considerations that should be matched to substantive decisions. Networks are measured as either egocentric or sociocentric. Egocentric networks begin with unrelated sets of individuals and the connections for each individual are uncovered. Sociocentric networks begin with an existing group from which the existing network is uncovered. Networks are considered fully connected if all members are connected to all other members through one or more direct or intermediate ties.[4] Networks are considered unconnected if they have two or more small groups of members (components) or individual members (isolates) who are not reachable through one or more intermediate ties.

Ties can be designated as either directional or non-directional. A non-directional tie indicates only that a tie exists, but does not indicate an "order" for the relationship. Examples of non-directional ties would include legislative co-sponsorship or shared board memberships. Directional ties differentiate between the sender and receiver of ties and are referred to as out-degree and in-degree, respectively. Examples would include international exports (out-degree) and imports (in-degree) or nominating another as a friend (out-degree) or being nominated as another's friend (in-degree). Similarly, network ties can be operationalized as valued or dichotomous relationships. Dichotomous ties indicate if a tie is present based on a given criteria (e.g. whether or not two legislators co-sponsored a bill in the previous session), whereas valued ties describe the extent of the relationship (e.g. the number of bills two legislators co-sponsored in the previous session). Valued relationships can be either ordinal (e.g. rank your interaction with all of your classmates) or scalar (e.g. the dollar value of trade between two countries).

[4] Egocentric networks by their very nature are rarely connected.

Networks are usually represented in one of two ways: through a sociogram or a sociomatrix. The following sociomatrix (Figure 2) indicates whether the "row" individual has a network tie to the "column" individual (1 represents the presence of a tie, 0 represents the lack of a tie). In the example, we can see that Adam has *sent* "nominations" to Betty, Chris and Donna, but not Edgar. Conversely, we can see that Adam has been "nominated" by Betty, Chris, Donna and Edgar. Thus we can see that the hypothetical network is a directed network, as the in-degrees and out-degrees are not symmetrical. We can also see that, at least initially, the network appears to be connected as everyone is tied to Adam by either a nomination sent or received. However, because Edgar's nomination of Adam was not reciprocated, Adam may not be able to reach him.

	A	B	C	D	E
Adam	-	1	1	1	0
Betty	1	-	0	1	0
Chris	1	0	-	0	1
Donna	1	1	0	-	0
Edgar	1	0	1	0	-

Figure 1. Sociogram of hypothetical network.

This is revealed more clearly in the second type of visual representation of the network structure, the sociogram. The letters represent the five network members and the lines or edges represent the presence of a tie between members with the arrows representing the direction of the tie. While the information contained in the sociogram in Figure 2 is equivalent to that found in the adjacency matrix, it is a much simpler task to trace the networks ties from each member to all other members to see that the network is in fact connected. While the same information can be

obtained from the adjacency matrix through matrix algebra, the simplicity of the sociogram is certainly useful.

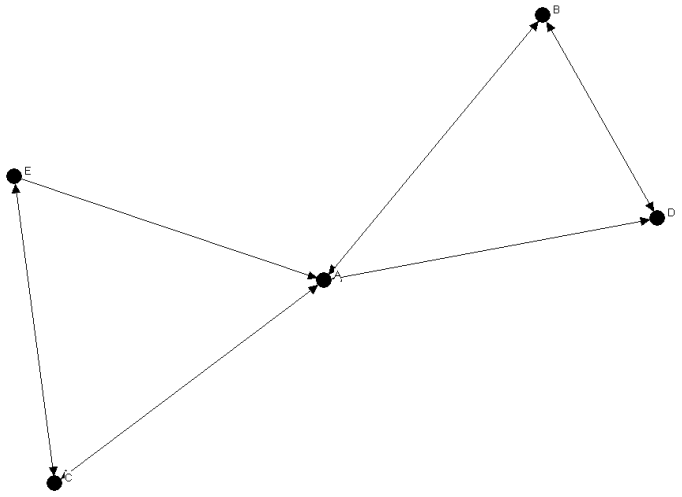

Figure 2. Sociomatrix of hypothetical network. All sociomatrixes created with NetDraw (Borgatti, 2002).

Network scholars utilize many different characteristics of the individual network members, network subgroups (often dyads and triads) and the network as a whole in their research. Commonly used characteristics of the network members include centrality, sub-group membership, and structural equivalence. Commonly used characteristics of network subgroups and the network structure include density, centralization and balance. Centrality is probably the most often used measure in network studies (Zemljic & Hlebec, 2005).

Social network prominence.

Measures of centrality locate an actor's importance or prominence within the network (Scott, 2000). Four common measures of centrality are based on degree, closeness, betweenness, and information (Freeman, 1978/79; Stephenson & Zelen, 1989). Most measures of centrality rely on non-directed, non-valued ties, but some are robust enough that they can be used for other types of data. Measures of prominence that employ directed data and that focus on ties received

are often referred to as prestige and include aspects of degree and proximity (Wasserman & Faust, 1994). It is important to recognize that network size greatly influences the degree of any member. A member connected to both other members of a three-person network would be highly central, while a member connected to two other people in a much larger network may be only a peripheral member of that larger network. As such, each of the following measures of prominence are standardized so that they can be compared across networks

Degree centrality (C'_D) is the simplest measure of centrality and is predicated upon the importance that network members have many direct ties to others (Freeman, 1978/79). Degree centrality is simply the number of ties for each member. Closeness centrality (C'_C) rests on the theoretical importance of being able to reach all group members through as few intermediaries as possible (Freeman, 1978/79). Closeness centrality is calculated by the inverse of the sum of the steps it takes to get from one member to every other group member using the shortest route through the network (known as the geodesic).[5] It is also been suggested that members are prominent if they are located between many other sets of members within the network, and thus are able to control the flow of resources through the network. Betweenness (or bridging) centrality (C'_B) measures the number of geodesics for all other pairs of member that the actor is a part of (Freeman, 1979).[6] Information centrality expands the notion of closeness to include all possible routes between members instead of only the geodesics (Stephenson & Zelen, 1989). So, in relation to information centrality, prominent network members are both *closely* connected to

[5] Fowler, J.H. (2006) offers an expansion of the measure of closeness centrality to include all possible paths between network members, not just the geodesics. He calls this weighting of all possible paths "connectedness". Other measures of centrality based on distance, while used rarely, are also possible. These types of centrality measure the distance from the member to a specific other member of the group. Eccentricity refers to a member's longest geodesic. The mean distance is the average length of all geodesics, while the median distance is median geodesic. Since higher eccentricity, means and medians relate to less central members, these measures may be more properly viewed as measures of decentrality.

[6] Newman (2005) has provided a more complex measure of betweenness that includes all possible links between members, not just the shortest geodesics, and weights them according to their length.

others and *densely* connected to others. The four measures of centrality for the non-directed hypothetical network in Figure 2 are summarized in Table 1.

Table 1

Four Prominence Measures for Non-Directed Network

	C'_D	C'_C	C'_B	C'_I
Adam	0.750	0.800	0.667	1.154
Betty	0.500	0.571	0.000	0.882
Chris	0.500	0.667	0.500	0.938
Donna	0.500	0.571	0.000	0.882
Edgar	0.250	0.444	0.000	0.600

Selection of the appropriate centrality measure is a substantive decision and should be based on characteristics of the networks ties under study (often indicated as the flow of resources [e.g. financial, information, or social support] through a network structure). Degree centrality measures are usually the best indication of prominence if the resource is consumed through the first connection so that intermediate links are not possible, as in the case of social support through family members. Closeness centrality would be important if the strength of a relationship declines or decays through subsequent intermediate links as in the study of the accuracy of information dispersed through a communication network. Betweenness centrality would be indicated if the nature of the relationship allows the prominent individual to serve a "gatekeeping" function controlling whether or not resources can flow through them. Betweenness would be especially important to understand in communication systems when attempting to determine who receives what types of information. Information centrality would best be suited for situations in which the resource does not diminish through subsequent links

between members. Epidemiological studies that assess who the key patients were in the spread of a disease would be a use of this measure.

The above four measures of centrality have been applied to fully connected, non-directional, non-valued networks. Two of the four previous measures of centrality (using only out-degrees) and two additional measures of prestige (using in-degrees) can be applied to directed networks. Distances to and from a pair of network members are often unequal in directed graphs and so will result in some similar and some very different prominence scores from those mentioned above. Wasserman and Faust (1994) suggest that only degree and closeness centrality should be used for directed graphs.[7] In each case, the out-degree ties are used to calculate the centrality in the same way as done for non-directed graphs.[8] Closeness centrality can only be determined if every group member is reachable from every other group member. Prestige in networks is measured using only in-degree ties. Degree prestige (P'_D) is simply the number of alters who have selected the member as a direct tie. Proximity prestige (P'_P) uses influence (the number of network members who can ultimately reach the member of interest through some combination of a direct tie or indirect ties) to adapt the non-directional measure of closeness to directed networks. The prominence of network members for the directed graph is summarized in Table 2.

[7] White & Borgatti (1994) have since provided a measure of directed betweenness centrality that overcomes Wasserman & Faust's (1994) original critique of such a measure.

[8] If we had decided to symmetrize the original network to maximize network ties (meaning we would turn both reciprocated and non-reciprocated ties into non-directed ties), both the degree and closeness centralities would remain unchanged.

Table 2

Four Prominence Measures for Directed Network

	C'_D	C'_C	P'_D	P'_P
Adam	0.750	0.800	1.000	1.000
Betty	0.500	0.571	0.750	0.667
Chris	0.500	0.667	0.750	0.667
Donna	0.500	0.571	0.750	0.667
Edgar	0.250	0.667	0.250	0.444

Selection of the appropriate prominence measure for directed graphs based on substantive theory is just as important as in non-directed graphs. Degree-based measures of centrality and prestige indicate prominence of those who select a large number of others to interact with or who are selected by a large number of others, respectively. This information, especially if coupled with valued relationships such as in understanding international imports and exports. Countries with low degree centrality would indicate a limited number of partners who are willing to accept the resources produced by that country (limited buyers of the country's products), whereas a low degree prestige would indicate a limited number of trading partners who are interested in selling goods to that country (limited number of sellers of goods and likely a limited availability of products for people to buy). Closeness centrality and proximity prestige each take into account, not only the number of network members a specific member can reach directly, but also include a weighted measure of those reachable through one or more indirect ties. Both would be valuable tools in understanding the flow of communication through a network, as closeness centrality would be indicative of the member's ability to spread information throughout a network and proximity prestige would be indicative of how likely a person is to receive information available

anywhere throughout the network. Such measures could be used in understanding how people hire new employees or learn about new jobs, respectively.

Conclusion

The proceeding literature review situates this research within the substantive scholarship of adventure experiences and the methodological scholarship of social networks. The continuing development of adventure-based learning models such as the Outward Bound Process offer increasingly nuanced understandings of the outcomes and experiences of adventure experiences. The use of social networks provides a novel framework to further understand the import of social interactions in adventure education programs. The relative paucity of such studies within recreation and leisure studies seems to point to new opportunities for exploring group-based adventure experiences. The selection of appropriate network measures, based upon sound theoretical decisions, can provide a useful tool for refinement and extension of the understanding of adventure experiences.

Chapter 3

Methods

This study sought to better understand the role of the social environment in adventure education by examining the impact of social networks on program outcomes. This research attempted to answer the following questions:

1. What participant characteristics are associated with social interactions between participants?
2. Is there a relationship between a participant's social networks and his or her adventure program outcomes?
3. If a relationship exists between participant's networks and his or her program outcomes, what characteristics of participant's social networks lead to increased program efficacy for individual participants?
4. How are changes in participant's social networks over the adventure education experience related to program efficacy for individual participants?

The following chapter is comprised of five sections. The first describes the adventure therapy program that serves as the intervention used in this study. The second describes the three instruments used in this study. The third section details the procedures followed in the data collection of this study. The fourth section describes the sample used in this study. The final section describes the data analysis.

Intervention

The sample for the current study was drawn from adventure therapy program groups of an outdoor therapeutic program in the southern United States. The therapeutic program provided a 21-day program for youth with minor behavioral problems. Program groups consisted of up to

six adolescents and young adults (aged 14-28) who were together for the duration of the program. The therapeutic program allowed participants to work on individual developmental goals, but also allowed each participant to work towards a common set of goals including

1. Participant will identify specific emotional issues which need further exploration and will participate in group and individual therapy sessions to help address each identified area.
2. Participant will examine personal attitudes, values, and morals in relationship to his/her overall self-concept. Participant will also be exposed to perspectives that may challenge his/her current modes of thinking and behaving.
3. Participant will learn how to develop a healthy awareness of personal strengths and weaknesses.
4. Participant will develop and improve upon necessary problem-solving skills, both on an individual and group basis.
5. Participant will explore the intricacies of family dynamics and develop an understanding of his/her role within the family.
6. Participant will take part in an experiential group and work towards understanding the dynamics of group cohesion.
7. Participant will work towards identifying and assessing specific options for post-course, follow-up treatment (program website, 2006).

The three-week curriculum wss entirely field-based. Participants met at the organization's offices for the first day of the course for orientation and return on the last day for "Family Day". Throughout the course, participants were active members of the group and engaged in canoeing, backpacking, and rock climbing activities. Participants were supervised by a master's-level clinician and non-clinical field staff.

Instrumentation

Three separate instruments were used to collect data. First, a brief questionnaire was used to determine basic demographic variables about the participant. Second, the Youth Outcome Questionnaire was used to determine both a baseline measure and outcome data for the therapeutic growth experienced through participation in the therapeutic program. Third, a sociometric name generator was used to draw out the connections between various members of the program groups.

Demographic instrument.

The initial demographic instrument (Appendix C) provided information on participant characteristics that are thought to affect program outcomes (Russell, 2001; Sibthorp, 2003). Specifically, the instrument assessed participants' age, sex, race/ethnicity, socioeconomic status, previous experience with adventure recreation activities, participant's level of motivation to attend, previous clinical diagnoses, and previous treatment sought. The demographic questionnaire was completed by the participant's parent/guardian during the first day's orientation.

Youth Outcome Questionnaire.

Adventure therapy program outcomes have previously been measured using the Youth Outcome Questionnaire or Y-OQ (Clark et al, 2004; Russell, 2001, 2002)[9]. Program outcomes for the current study were measured using both the Youth Outcome Questionnaire (Y-OQ) (completed by parents, legal guardians, or others who spend significant time with the youth) and the Y-OQ Self Report (Y-OQ SR, completed by the youth) at the start and end of the program. The YOQ was specifically designed to detect and track changes in functioning levels over time

[9] The Y-OQ and Y-OQ SR are copyrighted and, as such, could not be reproduced in this manuscript.

as a result of participation in a therapeutic intervention (Wells, Burlingame, Lambert, Hoag, & Hope, 1996).

The Y-OQ and Y-OQ SR each contain a global measure of behavioral change and six behaviorally-normed scales (Burlingame et al., 1996; Wells, Burlingame, & Rose, 1996). The 64-item instruments provide a range of scores for the global scales of -16 to 240, with high numbers representing behavior dysfunction.

1. The Interpersonal Distress scales (18 items, range of -4 to 68) determine the youth's emotional distress. An example of an item from the Interpersonal Distress scale is "wants to be alone more than other children of the same age".
2. The Somatic scale (8 items, range of 0 to 32) indicates the level of somatic symptoms the youth experiences. An example of an item from the Somatic scale is "complains of dizziness or headaches".
3. The Interpersonal Relations scale (10 items, range of -6 to 34) indicate the youth's ability to interact with peers and adults. An example of an item from the Interpersonal Relations scale is "argues or is verbally disrespectful".
4. The Critical Items scale (9 items, range of 0 to 36) assesses symptoms of disorders that typically require in-patient treatment such as suicidal thoughts, hallucinations, and eating disorders. An example of an item from the Critical Items scale is "sees, hears, or believes things that are not real".
5. The Social Problems scale (8 items, range of -2 to 30) measures delinquent or aggressive behaviors. An example of an item from the Social Problems scale is "cuts school or is truant".
6. The Behavioral Dysfunction scale (11 items, range of -4 to 40) indicates the youth's ability to organize tasks and complete assignments. An example of an

item from the Behavioral Dysfunction scale is “experiences rapidly changing and strong emotions”.

Normative data for the Y-OQ were drawn from a community population (n=683), an out-patient treatment population (n=342), and an in-patient treatment population (n=174) (Burlingame et al., 1996). A cutoff score to differentiate between the community and treatment populations were determined for both the global score (46 points) and each scale. Additionally, a reliable change index of 13 points was determined to indicate clinically significant change. Y-OQ scores must not only drop below the cutoff score, but must drop a minimum of 13 points for the change to be considered clinically significant. Normative data for the Y-OQ SR were drawn from a community population (n=512), a “partial hospital” population (n=291), an out-patient treatment population (n=228), and an in-patient treatment population (n=224) (Wells, Burlingame, & Rose, 1996). A cutoff score of 47 points and reliable change index of 18 points for the Y-OQ SR global score were determined.

The reliability of the Y-OQ was determined with the previously mentioned populations and an additional school sample (n=41). The internal consistency of the Y-OQ global score was estimated at 0.97 with individual scales ranging from 0.76 to 0.93 (Burlingame et al., 1996). The reliability of the Y-OQ SR was determined with the normative data populations. The internal consistency of the Y-OQ SR global score was estimated at 0.96 with individual scales ranging from 0.73 to 0.91(Wells, Burlingame, & Rose, 1996).

Network name generator.

A meta-analytic study of network methods proposed four aspects of instrumentation that affect the overall reliability of the network generator (Zemljic & Hlebec, 2005). The results of this review were used to inform the development of a social network name generator that

provided for high levels of reliability while ensuring that the study was based in the adventure education literature and not simply an atheoretical application of network methods.

Non-directed measures determine if a tie exists and can be provided at a minimized level (present if the tie is provided by both members) or a maximized level (present if a tie is provided by either member). Directed ties are often measured only as out-degrees (who the member selects or sends resources to) but can also be measured using in-degrees (who the member thinks they will be selected by or receives resources from).[10] A further advancement of this, called a cognitive network (Krackhardt, 1987), asks each network member to determine if a given relationship exists between all possible pairs of members, not just the pairs of which they are part.

Network measures of ties are developed as either a dichotomy or as a valued relationship. Zemljic and Hlebec (2005) examined four types of scales (binary, categorical with and without labels, and line drawings) and found that the more sensitive scales were also more reliable, albeit at the cost of simplicity.

Additionally, the format of the selection of group members has been determined to affect the reliability of network measures. Instruments regularly use either a "recognition" checklist in which all network members are provided and respondents simply select who they are connected to or indicate at what level they are connected to every other member. "Free-recall" instruments provide no prompting of possible alters from whom to choose.[11] Recognition instruments tend to result in more dense networks which are more reliable than less dense networks (Zemljic and Hlebec, 2005).

[10] In this case, a possible tie between two members could have four aspects: A's perception of giving to and receiving from B and B's perceptions of giving to and receiving from A.

[11] Recognition formats are only possible when measuring sociocentric networks as the boundaries of egocentric networks cannot be known prior to data collection.

While several aspects of the format of the instrumentation affect the reliability of network measures, the questions selected to provoke the network ties greatly influence both the number of ties and the composition of the ties (Campbell & Lee, 1991). While more concrete questions are more reliable (due to less interpretation on the part of respondents (Bailey & Marsden, 1999), Burt (1984) argues for the inclusion of several types of name generators to measure multiple aspects of individual's personal networks. Since the adventure education literature emphasizes social support (Walsh & Gollins, 1976), four measures of social support based on the work of Cohen and Wills (1985) (emotional support, informational support, instrumental support, and social companionship) were used to determine each individual's social networks.

Network ties for each of the four types of social support (and a summed global support scale) were gathered using directed non-valued ties. For each individual, the total number of in-degree and out-degree ties were summed for each of the four types of social support and then divided by the total number of possible ties. The global measure was determined by averaging the four types of social support. These proportions represent the number of social support ties self-reported by each individual and includes both those that the participant goes to for support and those that the participant gives social support to.

While cognitive networks provide the most robust data of the above types of network tie measurement, measures of both in- and out-degree ties for each tie that includes the respondent were chosen to balance reliability with time required to administer the instrument. The triangulation of this data across the direction of the interaction and the two members helped to address the accuracy concerns posed by Bernard, Killworth, & Sailer (1982). While valued measures of tie-intensity provide higher reliability, dichotomous measures of ties were used to improve the validity of the measures by allowing respondents to decide if a tie exists instead of

the researcher choosing an arbitrary cut-point. Finally, the use of recognition selection methods provided higher reliability and increased ease of scoring, and so was used throughout.

Procedures

Data was collected for ten outdoor therapeutic program groups between May 2007 and July 2008. Administrators at the therapeutic program managed the data collection process. Parents and participants were asked to participate and to complete an informed consent process. Parents and participants completed the Y-OQ and Y-OQ SR, respectively, at the program orientation and conclusion. Y-OQ and Y-OQ SR data were used to assess the change from the perspective of the participant and a parent or guardian. Parents additionally completed the demographic questionnaire during program orientation. Participants completed the social network generator during the middle of the program (at approximately day #11) and during the program conclusion. Network measurement at the end of the program provided a snapshot of the social networks established by the participant over the course of the program. Network measurement at the program's mid-point provided a comparison from which to assess the change in participant's social networks over the course of the program.

Sample

A total of 37 individuals participated in the 10 groups. The groups ranged in size from 3 to 6 participants with a median group size of 3.5. Thirty-six (97%) of the parents agreed to take part in the study. Thirty-five (97%) of the participating parents completed the Y-OQ pre-test and the demographic questionnaire. Partial demographic information is missing from two respondent's demographic questionnaire due to incomplete forms. Twenty-two (61%) of the participating parents completed the Y-OQ post-test.

Thirty-two (86%) of the 37 program participants agreed to take part in the study. Thirty-two (100%) completed the Y-OQ SR pre-test. Two program groups were not administered the

mid-course social network generator, thus only 27 (84%) of the study participants completed it (although 100% of those administered the survey completed it). Twenty-three (72%) of those in the study completed the Y-OQ SR post-test and the end-of-course social network generator.

The participants ranged in age from 14 to 26 with an average of 18.2 and a standard deviation of 3.04. Thirty-two participants (89%) were male. Thirty (83%) respondents indicated that they were white. All other racial/ethnic categories were dichotomized into a single category for future analyses.

The remaining demographic variables were not completed by two respondents. Income was also dichotomized with eighteen (53%) indicating that their combined family income was greater than $100,000. Twenty-two (65%) of respondents reported a previous psychological diagnosis, with fifteen (44%) reporting Attention Deficit Hyper-active Disorder (ADHD), seven (21%) depression, three (9%) substance abuse, and six (18%) a diagnosis of "other."

Twenty-nine (85%) indicated that the participant had some form of previous mental health treatment with twenty-three (68%) reporting out-patient treatment, seven (21%) reporting in-patient treatment, and five (15%) previous treatment in an adventure therapy program.

Parents were asked to indicate how much of the decision to attend the program was the participants. Seventeen (50%) indicated that it was either an equally shared decision or that the participant had a greater or full say in the decision to attend. Parents were also asked about the participant's previous experience with adventure activities. Nineteen (51%) participants had moderate or extensive experience, while the remainder had limited or no previous experience.

Data Analysis

All statistical analyses were conducted with SPSS 16.0. Ratio/interval level variables were assessed for normality with the Shapiro-Wilks Test of Normality. Variables that were determined to be non-normal were analyzed with the relevant non-parametric statistic.

Throughout the document, both the statistical and substantive significance of each test are reported via the p-value and the effect size. All tests are conducted with $\alpha = .05$. For consistency, unstandardized effects sizes are provided when discussing changes in Y-OQ scores. All other effect sizes are reported as the standardized correlation coefficient. Following Cohen's guidelines, *r* values equal to .1, .3, and .5 would be considered small, medium, and large effects respectively.

All regression models were assessed for multicollinearity. All predictors had tolerances greater than 0.2. Each regression model was also tested for outliers. Cook's *d* was used to assess the influence of individual cases. Two models were assessed to have outliers with Cook's *d* greater than 1.0; these models are noted below. Both models had the same two outliers and both cases were female participants. All cases were ultimately retained for all analyses.

The data analysis makes extensive use of linear regression for model testing. A basic assumption of linear regression is independence of observations. Network data, by its very nature, is not fully independent. Thus, the results of such analyses must be interpreted very cautiously.

Chapter 4

Results

This research attempted to answer the following four research questions:

1. What participant characteristics are associated with social interactions between participants?
2. Is there a relationship between a participant's social networks and his or her adventure program outcomes?
3. If a relationship exists between participant's networks and his or her program outcomes, what characteristics of participant's social networks lead to increased program efficacy for individual participants?
4. How are changes in participant's social networks over the adventure education experience related to program efficacy for individual participants?

These results are provided in six sections. First, the descriptive statistics for the social support and program outcome measures are summarized. Next, the findings for each of the four research questions are examined in turn.

Network Characteristics

Network characteristics were determined by the portion of all possible in-degrees and out-degrees that were indicated to exist by the participant for each of the four types of social support. The global measure of social support was determined similarly with each of the sub-scales having equal weight. Change scores were computed to determine how social support differed from mid-course to course end. Positive scores indicate more complete social networks

at the end of the course than at mid-course. Descriptive statistics for each social support scale are indicated in Table 3.

Table 3

Proportion of Possible Social Support Ties Present at Mid-Course and Termination

	Mid-Course (N=27) *M (SD)*	End-Course (N=23) *M (SD)*	Change Scores (N=19) *M (SD)*
Social Support	.434 (.2398)	.536 (.2344)	.160 (.1537)***
Social Companionship	.669 (.2327)	.800 (.2451)	.148 (.1880)**
Informational Support	.321 (.3031)	.478 (.2763)	.241 (.2666)**
Instrumental Support	.361 (.3299)	.490 (.3177)	.193 (.2093)**
Emotional Support	.389 (.3741)	.399 (.3588)	.087 (.2860)

Note. Global change score assessed for statistical significance with Paired Samples t-tests (2-tailed). Social support sub-scale change scores assessed for statistical significance with Wilcoxon Signed Rank Test.

* $p < 0.05$ level. ** $p < 0.01$ level. *** $p < 0.001$ level.

Pearson's correlations were computed to determine the test-retest reliability of the social support measures. The correlation for the Total Social Support measure was $r(19) = .797$. The correlations for the individual scales ranged from $r(19) = .396$ to $r(19) = .768$.

The social support scores were tested to determine if the change scores indicated a significant change from mid-course to course-end. Both the mid-course and course-end global social support scale scores met the assumption of normality as tested by the Shapiro-Wilks Test of Normality; however, the Informational ($W(19) = 0.811$, $p = .002$), Instrumental Support ($W(19) = .846$, $p = .006$), and Emotional Support($W(19) = 0.794$, $p = .001$) mid-course scores

and the Social Companionship($W(19) = 0.766$, $p = .000$) and Informational Support($W(19) = 0.897$, $p = .042$) end of course scores did not.

The global social support measure was thus assessed with a paired (dependent) samples *t*-test and was determined to be statistically significant ($t(18) = 4.538$, $p < .001$, $r = .80$). The social support sub-scale scores were each assessed with the Wilcoxon Signed Rank Test. The changes in Social Companionship ($z = 2.763$, $p = .006$, $r = .45$), Informational Support ($z = 2.834$, $p = .005$, $r = .46$) and Instrumental Support ($z = 2.956$, $p = .003$, $r = .48$) were found to be statistically significant. The change in Emotional Support was not found to be statistically significant ($z = 1.338$, $p = .181$).

Program Outcomes

Therapeutic growth as measured by the Y-OQ and Y-OQ SR served as the primary dependent variable. Baseline measures were collected during the initial in-take occurring during the first two days of the program. Follow-up data was collected in the final two days of the program. Scores were calculated following directions in the respective instruments scoring manual.

Parental reports.

Descriptive statistics for the parent's scores on the Y-OQ are provided in Table 4. Neither the Somatic scale pre-test and post-test ($W(18) = 0.802$, p=.002; $W(18) = 0.858$, $p = .011$) nor the Critical Items($W(18) = 0.785$, $p = .001$) scales post-test scores met the assumption of normality as tested by the Shapiro-Wilks Test of Normality; however, all others did. Pearson's correlations were computed to determine the test-retest reliability of the Y-OQ scales. The correlation for the global scale was $r(22) = .700$. The correlations for the individual scales ranged from $r(22) = .555$ to $r(22) = .724$.

The Y-OQ scores were tested to determine if the change scores indicated a significant difference. The global measure was thus assessed with a paired (dependent) samples *t*-test and was determined to be statistically significant ($t(21) = 4.710$, $p = .004$, $r = .70$). The change in the Social Problems ($t(21) = 5.194$, $p < .001$, $r = .56$), Interpersonal Relationships ($t(21) = 5.509$, $p < .001$, $r = .58$), Intrapersonal Distress ($t(21) = 3.762$, $p = .001$, $r = .70$) and Behavior Dysfunction ($t(21) = 3.302$, $p = .003$, $r = .56$) scales were found to be highly significant. The scores for the Somatic ($z = 1.977$, $p = .048$, $r = .30$) and Critical Items scales ($z = 2.382$, $p = .017$, $r = .36$) were assessed with the Wilcoxon Signed Rank Test and found to be moderately significant.

Table 4

Parent's Youth Outcome Questionnaire (Y-OQ) Scores at Course Start and End

	Pre (N=35)		Post (N=23)		Change (N=22)	
	Mean	SD	Mean	SD	Mean	SD
Youth Outcome Questionnaire	89.2	31.14	53.5	41.05	-29.1**	29.01
Intrapersonal Distress	28.2	10.22	18.3	12.64	-7.3***	9.07
Somatic	7.3	4.75	5.1	5.43	-1.6*	4.09
Interpersonal Relationships	11.9	5.72	4.9	7.07	-6.4***	5.90
Social Problems	12.5	5.39	6.1	5.57	-5.6***	5.05
Behavior Dysfunction	21.1	6.46	14.3	10.02	-5.9***	8.39
Critical Items	8.1	5.38	4.8	5.17	-2.5 *	4.26

Note. Somatic and Critical Items scales assessed for statistical significance with Wilcoxon Signed Rank Test; all others with paired (dependent) *t*-tests.

* $p < 0.05$ level. ** $p < 0.01$ level. *** $p < 0.001$ level.

Participant self-reports.

Descriptive statistics for the participant's scores on the Y-OQ are provided in Table 5. The Critical Items scale pre-test and post-test scores did not meet the assumption of normality as tested by the Shapiro-Wilks Test of Normality ($W(23) = 0.885$, $p = .012$; $W(23) = 0.914$, $p = .049$), however all others did. Pearson's correlations were computed to determine the test-retest reliability of the Y-OQ SR scales. The correlation for the Y-OQ SR global scale was $r(23) = .460$. The correlations for the individual scales ranged from $r(23) = .334$ to $r(23) = .735$.

The Y-OQ scores were tested to determine if the change scores indicated a significant difference. The global measure was thus assessed with a paired (dependent) samples *t*-test and was determined to be statistical significant ($t(22) = 2.659$, $p = .014$, $r = .46$). The changes in the Interpersonal Relationships ($t(22) = 2.861$, $p = .009$, $r = .47$), Social Problems ($t(22) = 3.594$, $p = .002$, $r = .74$), and Behavior Dysfunction ($t(22) = 2.271$, $p = .033$, $r = .33$) scales were found to be significant. Changes in Intrapersonal Distress ($t(22) = 1.912$, $p = .069$) and Somatic scale scores ($t(22) = .416$, $p = .681$) were found to be non-significant. The scores for the Critical Items scale were assessed with the Wilcoxon Signed Rank Test and found to be non-significant ($z = -1.220$, $p = .223$).

The Y-OQ scores were tested to determine if the change scores indicated a significant difference. The Critical Items scale pre-test and post-test scores did not meet the assumption of normality as tested by the Shapiro-Wilks Test of Normality ($W(23) = 0.885$, $p = .012$; $W(23) = 0.914$, $p = .049$), however all others did.

The global measure was thus assessed with a paired (dependent) samples *t*-test and was determined to be statistical significant ($t(22) = 2.659$, $p = .014$, $r = .46$). The changes in the Interpersonal Relationships ($t(22) = 2.861$, $p = .009$, $r = .47$), Social Problems ($t(22) = 3.594$, p

= .002, r = .74), and Behavior Dysfunction ($t(22) = 2.271$, p = .033, r = .33) scales were found to be significant. Changes in Intrapersonal Distress ($t(22) = 1.912$, p = .069) and Somatic scale scores ($t(22) = .416$, p = .681) were found to be non-significant. The scores for the Critical Items scale were assessed with the Wilcoxon Signed Rank Test and found to be non-significant (z = -1.220, p = .223).

Table 5

Participant's Youth Outcome Questionnaire Self-Report (Y-OQ SR) Scores at Course Start and End

	Pre (N=32)		Post (N=23)		Change (N=23)	
	Mean	SD	Mean	SD	Mean	SD
Youth Outcome Questionnaire SR	68.7	29.96	53.9	22.35	-16.3*	29.41
Intrapersonal Distress	21.2	10.15	17.2	8.84	-4.4	10.91
Somatic	5.8	3.31	5.7	2.99	-0.3	3.51
Interpersonal Relationships	6.9	5.33	4.1	4.44	-3.2**	5.39
Social Problems	9.8	6.00	6.2	4.75	-3.3**	4.35
Behavior Dysfunction	16.2	6.35	13.4	5.61	-3.3*	6.98
Critical Items	8.8	5.88	7.4	4.38	-1.9	6.20

Note. Critical Items scale assessed for statistical significance with Wilcoxon Signed Rank Test; all others with paired (dependent) *t*-tests.

* p < 0.05 level. ** p < 0.01 level.

Research Question #1

What demographic variables are associated with high levels of social support? To explore this research question, the demographic variables and Y-OQ SR pre-test scores were correlated with the social support scores at both mid-course and course end. None of the demographic controls or baseline YO-Q scores was significantly correlated with the social support scores at mid-course as shown in Table 6.

Table 6

Correlations of Demographic Controls and Y-OQ SR Pre-test Scores with Social Support at Mid-Course

	Social Companionship	Informational Support	Instrumental Support	Emotional Support	Total Social Support
Y-OQ: Intrapersonal Distress	-.319	.373	.206	.177	.181
Y-OQ: Somatic	-.085	.094	-.029	-.118	-.045
Y-OQ: Interpersonal Relationships	-.378	.222	-.062	.146	.016
Y-OQ: Social Problems	-.085	.278	.084	.098	.134
Y-OQ: Behavior Dysfunction	-.236	.108	.248	-.066	.038

Y-OQ: Critical Items	-.262	.341	.143	.071	.122
Y-OQ: Total	-.308	.327	.156	.094	.120
Motivation	.055	-.033	-.053	-.156	-.076
Previous Experience	.129	.173	.138	.031	.143
Previous Treatment	-.012	.064	-.197	-.013	-.052
Formal Diagnosis	.012	-.076	-.246	.003	-.101
Income	.256	.207	.250	.308	.328
Race/Ethnicity	.185	-.274	-.117	-.371	-.226
Sex	.221	.251	.153	.152	.243
Age	-.097	-.116	-.128	.155	-.045

Intrapersonal Distress was correlated with Social Companionship (r = -.426, p = .04) at course-end. None of the demographic controls or other baseline YO-Q scores were significantly correlated with the social support scores at course end as shown in Table 7.

Table 7

Correlations of Demographic Controls and Y-OQ SR Pre-test Scores with Social Support at Course-End

	Social Companionship	Informational Support	Instrumental Support	Emotional Support	Total Social Support

Y-OQ: Intrapersonal Distress	-.316	.186	.305	.099	.137
Y-OQ: Somatic	-.245	-.006	.079	-.224	-.174
Y-OQ: Interpersonal Relationships	-.432*	-.210	-.303	-.084	-.329
Y-OQ: Social Problems	-.084	-.022	-.181	-.120	-.204
Y-OQ: Behavior Dysfunction	-.226	.229	.061	-.117	-.027
Y-OQ: Critical Items	-.395	.094	.059	-.032	-.080
Y-OQ: Total	-.347	.083	.042	-.060	-.094
Motivation	-.069	.113	.233	.201	.186
Previous Experience	-.010	-.115	-.097	.158	-.038
Previous Treatment	-.125	-.305	-.384	-.225	-.333
Formal Diagnosis	-.046	-.113	-.188	-.124	-.172
Income	-.065	.052	.088	.058	.078
Race/Ethnicity	.148	.106	.229	-.252	.069
Age	.014	-.237	-.045	.052	-.023

* $p < 0.05$ level (2-tailed).

As a second step, the total number of social support ties indicated by participants in each of the 34 complete dyads was calculated. The scores for the social support subscales ranged from zero for pairs who indicated no relationship to four for pairs who nominated each other for both the giving and receiving of that type of social support. The total social support ties were summed across the four subscales with a possible range of 0 to 16. Actual scores included the full potential range for each scale and subscale. The global social support score met the assumption of normality as tested by the Shapiro-Wilks Test of Normality. The mean for the global social support scale was 7.1 and the standard deviation was 4.08.

The social support ties for global scale were regressed upon differences between the participants in the dyad for the Y-OQ SR Total scores and demographic variables. The total set of predictors was first entered into the linear regression model and then stepwise regression was used to eliminate non-significant predictors. The full model was determined to be non-significant ($F(9,19) = 0.456$, $R^2 = .18$, $p = .886$) as all variable were removed in the stepwise regression.

To aid interpretation, the Y-OQ changes scores were reverse coded for the remainder of the analysis. Thus, higher scores indicated greater therapeutic growth. Negative scores indicated increased therapeutic dysfunction.

Research Question #2

Following the exploration of what impacts the social support networks developed by participants, the second research question attempts to determine if there is a relationship between these social networks and the participant's adventure program outcomes. This section will outline the following steps of the data analysis. First, all correlations between the two global outcome variables (Y-OQ and Y-OQ SR change scores) and all demographic and social support variables were calculated. Second, the demographic variables were regressed on each of the global outcome variables. Third, the Total Social Support scores and significant demographic

variables were regressed on the global outcome scores. Fourth, the Total Social Support scores and significant demographic variables were regressed on the specific outcome scales.

To explore the basic relationships between these variables, the demographic variables and social support scores were correlated with the Y-OQ and Y-OQ SR global change scores. One of the control variables, Instrumental Social Support at the end of the course ($r = .461$, $p < .05$) was correlated with the Y-OQ change score.

Six variables were correlated with the Y-OQ SR change scores: two demographic controls, three mid-course social support variables, and one course end social support variable. Participant's sex ($r = .512$, $p < .05$) and motivation ($r = .463$, $p < .05$) were statistically significant indicating that female participants and participants who were more motivated to attend experienced greater change. Total ($r = .476$, $p < .05$), Informational ($r = .543$, $p < .01$), and Instrumental ($r = .508$, $p < .05$) Social Support at mid-course were correlated with the Y-OQ SR change scores. Informational Social Support at the end of the course ($r = .461$, $p < .05$) was also correlated with the Y-OQ SR change scores. For all social support variables, the positive correlations indicate that greater amounts of social support are related to larger therapeutic gains. Table 6 lists the correlations for all comparisons.

The eight primary demographic controls were regressed on the Y-OQ and Y-OQ SR global scores. First, all variables were entered into the regression model. Second, stepwise regression was used to determine a more parsimonious model for the demographic variables. Table 9 reports the values for the Y-OQ. Table 10 reports the values for the Y-OQ SR.

Table 8

Correlations of Demographic Controls and Social Network Measures with Y-OQ and Y-OQ SR Change Scores

	Y-OQ Total	Y-OQ SR Total
Age at course entry	-.317	.061
Sex	.127	.512*
Race/Ethnicity (Dichotomized)	.278	-.347
Income (Dichotomized)	-.251	.019
Formal diagnosis	.145	.015
Diagnosed with ADHD	.238	-.116
Diagnosed with Depression	-.079	.374
Diagnosed with Substance Abuse	-.182	.215
Diagnosis of anything else	.153	.225
Previous Treatment 1=previous treatment	.165	-.275
Previous Out-patient Treatment	-.027	.077
Previous In-patient Treatment	.350	.319
Previous Wilderness or Adventure Treatment	.009	.089
Previous Other Treatment	.137	-.261
Motivation (Dichotomized)	.092	.463*
Previous Experience (Dichotomized)	-.035	.242
Social Support – Mid Course	-.044	.476*
Social Companionship	.184	.060

Informational Support	.164	.543*
Instrumental Support	.034	.508*
Emotional Support	-.334	.356
Social Support –End of Course	.202	.369
Social Companionship	.095	-.016
Informational Support	.318	.461*
Instrumental Support	.461*	.412
Emotional Support	-.184	.265

* $p < 0.05$ level (2-tailed).

The full regression model fitting the demographic controls to the Y-OQ change scores was not significant ($F(8,12) = 0.408$, $p = .895$). The stepwise regression eliminated all demographic predictors. Tolerance values for the predictors ranged from .522 to .786 indicating little concern with multicollinearity. For future analyses on Y-OQ scores, none of the demographic variables will be retained.

Table 9

Demographic Controls Regressed on Parent's Y-OQ Change Scores

	B	SE B	Beta
Model 1			
Constant	69.80	75.09	
Age at course entry	-3.15	4.14	-.25
Sex	-2.00	33.02	-.02
Race/Ethnicity	12.96	22.00	.20
Income	10.97	19.26	-.19

Formal Diagnosis	4.775	21.79	.08
Previous Treatment	9.17	32.5	.09
Motivation to Attend	5.90	17.25	.10
Previous Experience	4.54	17.18	.08

Note. R^2 = .21 and Adj. R^2 = -.31 for Model 1.

The full regression model fitting the demographic controls to the Y-OQ SR change scores was statistically significant ($F(8,12) = 4.294$, $R^2 = .74$, $p = .012$). The stepwise regression retained the four variables found to be significant in the full model ($F(4,16) = 7.242$, $R^2 = .64$, $p = .002$). The adjusted R^2 for the final model was .56 indicating a relatively close fit to the population. Tolerance values were the same as above and indicate little concern with multicollinearity. For future analyses on Y-OQ SR scores, sex, income, and motivation will be retained as control variables.

Table 10

Demographic Controls Regressed on Participant's Y-OQ SR Change Scores

	B	SE B	Beta
Model 1			
Constant	-36.90	43.98	
Age at course entry	2.98	2.42	.23
Sex	69.44	19.34	.69**
Race/Ethnicity	-1.25	12.88	-.02
Income	29.24	11.28	.49*
Formal Diagnosis	16.59	12.76	.26
Previous Treatment	-41.69	19.03	-.41*

Motivation to Attend	-5.54	10.06	-.09**
Previous Experience	31.87	10.10	.52
Model 2			
Constant	15.16	16.43	
Sex	62.06	15.91	.62***
Income	23.33	9.92	.39*
Previous Treatment	-29.40	15.19	-.29
Motivation to Attend	32.35	9.77	.53**

Note. R^2 = .64 and Adj. R^2 = .57 for Model 1. R^2 = .64 and Adj. R^2 = .56 for Model 2.

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Next, the retained demographic controls and the course end total social support measure were regressed on the Y-OQ and Y-OQ SR global change scores. The regression model fitting Total Social Support to the Y-OQ global change scores was not significant ($F(1,20) = 0.828$, p = .368). The regression model fitting the three retained controls and Total Social Support to the Y-OQ SR change scores was significant ($F(4,16) = 5.709$, $R^2 = .59$, $p = .005$). However, Total Social Support was not a significant predictor within the model. Thus, there is insufficient evidence to suggest that social support has any impact on global measures of therapeutic growth.

However, social support may be linked directly to one or more specific types of therapeutic growth as measured by the Y-OQ and Y-OQ SR sub-scales. The retained demographic controls and the course end total social support measure were regressed on each of the six Y-OQ and Y-OQ SR sub-scale change scores. The models that predict the individual Y-OQ sub-scales from Total Social Support were not statistically significant. Half of the models that predict the Y-OQ sub-scales from the three demographic controls and Total Social Support were significant predictors ($p < .05$). However, Total Social Support was not a significant

predictor within any of the models, suggesting limited applicability of the overall measure of social support for predicting even specific therapeutic outcomes.

Research Question #3

The previous section reviewed the dearth of evidence available that would suggest that the overall measure of social support is related to either global or specific therapeutic outcomes for participants in adventure therapy programs. Given the range of social support structures that were measured in the Total Social Support scale, it is possible that the scale is too broad and that specific types of social support may serve as better predictors of therapeutic outcomes. The following section outlines the analyses completed as the specific types of social support are assessed for their ability to predict both the global and sub-scales of the Y-OQ and Y-OQ SR.

The four social support scales are regressed on the Y-OQ Total change scores and each of the Y-OQ sub-scale change scores. The four social support scales and three retained demographic controls (Sex, Income, and Motivation) are also regressed on the Y-OQ SR sub-scale change scores. Tolerance values for the predictors all exceeded 0.200 indicating little concern with multicollinearity. For each model, the social support sub-scale scores and relevant controls are entered into the first model. A second model is also developed using stepwise regression during which variables are entered into the model if $p < .05$ and removed if $p > .10$.

The full regression model fitting the four types of social support to the Y-OQ Total change scores was not significant ($F(4,17) = 1.998$, $p = .141$). The stepwise regression eliminated all independent variables but Instrumental Support ($F(1,20) = 5.400$, $R^2 = .21$, $p = .031$). The full and final models are described in Table 11.

Table 11

Social Support Measures Regressed on Parent's Y-OQ Total Change Scores

	B	SE B	Beta
Model 1			
Constant	14.916	19.761	
Social Companionship	-2.710	30.408	-.023
Informational Support	15.439	37.794	.146
Instrumental Support	40.633	27.011	.455
Emotional Support	-28.236	18.050	-.357
Model 2			
Constant	8.996	10.332	
Instrumental Support	41.141	17.703	.461*

Note. R^2 = .32 and Adj. R^2 = .16 for Model 1. R^2 = .21 and Adj. R^2 = .17 for Model 2.

* $p < 0.05$.

The full regression model fitting the four types of social support and three retained control variables to the Y-OQ SR Total change scores was significant ($F(7,13) = 4.460$, $R^2 = .71$, $p = .010$). The stepwise regression eliminated Informational and Emotional Support ($F(5,15) = 7.028$, $R^2 = .70$, $p = .001$). The full and final models are described in Table 12.

Table 12

Social Support Measures Regressed on Participant's Y-OQ SR Total Change Scores

	B	SE B	Beta
Model 1			
Constant	5.715	18.016	
Sex	64.039	19.288	.635**
Income	16.727	10.581	.282
Motivation to Attend	22.911	11.091	.376
Social Companionship	-47.386	25.261	-.388
Informational Support	12.983	33.538	.120
Instrumental Support	36.497	28.226	.378
Emotional Support	3.505	14.711	.042
Model 2			
Constant	4.520	16.627	
Sex	68.333	15.866	.678***
Income	17.820	9.651	.301
Motivation to Attend	23.297	10.064	.382*
Social Companionship	-43.165	22.173	-.354
Instrumental Support	45.328	17.496	.469*

Note. R^2 = .71 and Adj. R^2 = .55 for Model 1. R^2 = .70 and Adj. R^2 = .60 for Model 2.

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

The full regression model fitting the four types of social support to the Y-OQ Intrapersonal Distress change scores was not significant ($F(4,17) = 2.091$, $p = .127$). The

stepwise regression eliminated all independent variables but Instrumental and Emotional Support ($F(2,19) = 4.420$, $R^2 = .32$, $p = .027$). The full and final models are described in Table 13.

Table 13

Social Support Measures Regressed on Parent's Y-OQ Intrapersonal Distress Change Scores

	B	SE B	Beta
Model 1			
Constant	3.685	6.130	
Social Companionship	3.507	9.432	.095
Informational Support	-6.262	11.723	-.189
Instrumental Support	16.385	8.379	.588
Emotional Support	-10.469	5.599	-.423
Model 2			
Constant	4.881	3.312	
Instrumental Support	13.610	5.478	.488*
Emotional Support	-10.838	4.860	-.438*

Note. $R^2 = .33$ and Adj. $R^2 = .17$ for Model 1. $R^2 = .32$ and Adj. $R^2 = .25$ for Model 2.

* $p < 0.05$.

The full regression model fitting the four types of social support and three control variables to the Y-OQ SR Intrapersonal Distress change scores was not significant ($F(7,13) = 4.195$, $R^2 = .69$, $p = .013$). The stepwise regression eliminated Informational and Emotional Support ($F(5,15) = 5.698$, $R^2 = .66$, $p = .004$). The full and final models are described in Table 14.

Table 14

Social Support Measures Regressed on Participant's Y-OQ SR Intrapersonal Distress Change Scores

	B	SE B	Beta
Model 1			
Constant	-.250	6.855	
Age	14.059	7.340	.374
Income	8.247	4.026	.374
Motivation to Attend	6.297	4.220	.277
Social Companionship	-21.708	9.612	-.477*
Informational Support	8.553	12.762	.213
Instrumental Support	15.678	10.741	.435
Emotional Support	5.594	5.598	.182
Model 2			
Constant	-1.768	6.650	
Age	17.619	6.345	.469*
Income	9.463	3.860	.429*
Motivation to Attend	7.156	4.025	.315
Social Companionship	-17.445	8.868	-.384
Instrumental Support	22.032	6.997	.612**

Note. R^2 = .69 and Adj. R^2 = .53 for Model 1. R^2 = .66 and Adj. R^2 = .54 for Model 2.

* $p < 0.05$. ** $p < 0.01$.

The full regression model fitting the four types of social support to the Y-OQ Somatic change scores was not significant ($F(4,17) = 2.898$, $p = .054$). The stepwise regression eliminated all independent variables but Informational and Emotional Support ($F(2,19) = 5.800$, $R^2 = .38$, $p = .011$). The full and final models are described in Table 15.

Table 15

Social Support Measures Regressed on Parent's Y-OQ Somatic Change Scores

	B	SE B	Beta
Model 1			
Constant	-.158	2.605	
Social Companionship	-3.062	4.008	-.185
Informational Support	10.312	4.982	.691
Instrumental Support	1.232	3.561	.098
Emotional Support	-3.940	2.379	-.353
Model 2			
Constant	-1.639	1.531	
Informational Support	10.013	2.986	.671***
Emotional Support	-4.427	2.235	-.397

Note. $R^2 = .41$ and Adj. $R^2 = .27$ for Model 1. $R^2 = .38$ and Adj. $R^2 = .31$ for Model 2.

*** $p < 0.001$.

The full regression model fitting the four types of social support and three control variables to the Y-OQ SR Somatic change scores was not significant ($F(7,13) = 1.509$, $p = .247$). The stepwise regression eliminated all independent variables Informational Support ($F(1,19) = 4.163$, $p = .055$). The full and final models are described in Table 16.

Table 16

Social Support Measures Regressed on Participant's Y-OQ SR Somatic Change Scores

	B	SE B	Beta
Model 1			
Constant	-.544	2.948	
Sex	3.429	3.157	.285
Income	1.335	1.732	.189
Motivation to Attend	2.488	1.815	.342
Social Companionship	-5.132	4.134	-.352
Informational Support	8.638	5.489	.670
Instrumental Support	-1.807	4.619	-.156
Emotional Support	-.916	2.408	-.093
Model 2			
Constant	-2.355	1.509	
Informational Support	5.466	2.679	.424

Note. R^2 = .45 and Adj. R^2 = .15 for Model 1. R^2 = .18 and Adj. R^2 = .14 for Model 2.

The full regression model fitting the four types of social support to the Y-OQ Interpersonal Relationships change scores was not significant ($F(4,21) = 0.335$, $p = .851$). The stepwise regression retained only the constant.

The full regression model fitting the four types of social support and three control variables to the Y-OQ SR Interpersonal Relationships change scores was not significant ($F(7,13) = 2.787$, $p = .053$). The stepwise regression eliminated all independent variables but Sex, Social Companionship, and Instrumental Support ($F(3,17) = 5.445$, $R^2 = .49$, $p = .008$). Two variables

exerted undue influence on the model (Cook's d > 1.0), but were ultimately retained. The full and final models are described in Table 17.

Table 17

Social Support Measures Regressed on Participant's Y-OQ SR Interpersonal Relationships Change Scores

	B	SE B	Beta
Model 1			
Constant	9.067	3.885	
Sex	12.349	4.159	.662*
Income	.474	2.282	.043
Motivation to Attend	2.100	2.392	.186
Social Companionship	-13.545	5.447	-.600*
Informational Support	-8.637	7.232	-.433
Instrumental Support	11.522	6.087	.645
Emotional Support	2.874	3.172	.188
Model 2			
Constant	10.443	3.257	
Sex	11.200	3.441	.601**
Social Companionship	-15.806	4.801	-.700**
Instrumental Support	8.326	3.635	.466**

Note. R^2 = .60 and Adj. R^2 = .39 for Model 1. R^2 = .49 and Adj. R^2 = .40 for Model 2.

* $p < 0.05$. ** $p < 0.01$.

The full regression model fitting the four types of social support to the Y-OQ Social Problems change scores was not significant ($F(4,17) = 0.892$, $p = .490$). The stepwise regression retained only the constant.

The full regression model fitting the four types of social support and the three demographic variables to the Y-OQ SR Social Problems change scores was not significant ($F(7,13) = 1.790$, $p = .173$). The stepwise regression eliminated all independent variables but Sex and Motivation ($F(2,18) = 4.917$, $R^2 = .35$, $p = .020$). The full and final models are described in Table 18.

Table 18

Social Support Measures Regressed on Participant's Y-OQ SR Social Problems Change Scores

	B	SE B	Beta
Model 1			
Constant	1.009	3.375	
Sex	7.285	3.614	.507
Income	2.347	1.982	.278
Motivation to Attend	3.608	2.078	.416
Social Companionship	-1.841	4.733	-.106
Informational Support	-1.430	6.283	-.093
Instrumental Support	.799	5.288	.058
Emotional Support	3.065	2.756	.260
Model 2			
Constant	1.765	1.037	
Sex	6.059	2.730	.422*

Motivation	3.353	1.650	.386

Note. R^2 = .49 and Adj. R^2 = .22 for Model 1. R^2 = .35 and Adj. R^2 = .28 for Model 2.

* $p < 0.05$.

The full regression model fitting the four types of social support to the Y-OQ Behavior Dysfunction change scores was not significant ($F(4,17) = 1.725$, $p = .191$). The stepwise regression eliminated all independent variables but Instrumental Support ($F(1,20) = 3.845$, $p = .064$). The full and final models are described in Table 19.

Table 19

Social Support Measures Regressed on Parent's Y-OQ Behavior Dysfunction Change Scores

	B	SE B	Beta
Model 1			
Constant	.395	5.846	
Social Companionship	2.161	8.996	.064
Informational Support	7.263	11.181	.237
Instrumental Support	7.883	7.991	.305
Emotional Support	-9.211	5.340	-.402
Model 2			
Constant	.835	3.085	
Instrumental Support	10.366	5.286	.402

Note. R^2 = .29 and Adj. R^2 = .12 for Model 1. R^2 = .16 and Adj. R^2 = .12 for Model 2.

The full regression model fitting the four types of social support and the three control variables to the Y-OQ SR Behavior Dysfunction change scores was not significant ($F(7,13) = 1.387$, $R^2 = .43$, $p = .290$). The stepwise regression eliminated all independent variables but Sex ($F(1,19) = 4.993$, $R^2 = .21$, $p = .038$). The full and final models are described in Table 20.

Table 20

Social Support Measures Regressed on Participant's Y-OQ SR Behavior Dysfunction Change Scores

	B	SE B	Beta
Model 1			
Constant	-4.568	6.026	
Sex	11.634	6.451	.481
Income	2.862	3.539	.201
Motivation to Attend	4.105	3.710	.281
Social Companionship	2.120	8.449	.072
Informational Support	5.227	11.217	.202
Instrumental Support	3.933	9.441	.170
Emotional Support	-5.801	4.920	-.293
Model 2			
Constant	2.474	1.523	
Sex	11.026	4.935	.456*

Note. R^2 = .43 and Adj. R^2 = .12 for Model 1. R^2 = .21 and Adj. R^2 = .17 for Model 2.

* $p < .05$.

The full regression model fitting the four types of social support to the Y-OQ Critical Items change scores was significant ($F(4,21) = 3.453$, $R^2 = .45$, $p = .031$). The stepwise regression eliminated all independent variables but Instrumental and Emotional Support ($F(2,19) = 7.544$, $R^2 = .44$, $p = .004$). The full and final models are described in Table 21.

Table 21

Social Support Measures Regressed on Parent's Y-OQ Critical Items Change Scores

	B	SE B	Beta
Model 1			
Constant	1.233	2.614	
Social Companionship	-1.556	4.023	-.090
Informational Support	.127	5.000	.008
Instrumental Support	8.611	3.573	.657*
Emotional Support	-4.631	2.388	-.398
Model 2			
Constant	.337	1.407	
Instrumental Support	8.322	2.327	.635**
Emotional Support	-4.965	2.064	-.427*

Note. R^2 = .45 and Adj. R^2 = .32 for Model 1. R^2 = .44 and Adj. R^2 = .38 for Model 2.

* $p < 0.05$. ** $p < 0.01$.

The full regression model fitting the four types of social support and three control variables to the Y-OQ SR Critical Items change scores was significant ($F(7,13) = 3.124$, R^2 = .63, p = .036). The stepwise regression eliminated all independent variables but Sex and Motivation ($F(2,18) = 9.943$, R^2 = .53, p = .001). Two variables exerted undue influence on the model (Cook's d > 1.0), but were ultimately retained. The full and final models are described in Table 22.

Table 22

Social Support Measures Regressed on Participant's Y-OQ SR Critical Items Change Scores

	B	SE B	Beta
Model 1			
Constant	1.001	4.275	
Sex	15.283	4.577	.719**
Motivation	1.462	2.511	.117
Motivation to Attend	4.314	2.632	.336
Social Companionship	-7.280	5.995	-.283
Informational Support	.631	7.959	.028
Instrumental Support	6.371	6.698	.313
Emotional Support	-1.312	3.491	-.075
Model 2			
Constant	-.877	1.315	
Sex	12.401	3.464	.584**
Motivation	4.952	2.094	.385*

Note. R^2 = .63 and Adj. R^2 = .43 for Model 1. R^2 = .53 and Adj. R^2 = .47 for Model 2.

* $p < 0.05$. ** $p < 0.01$.

Table 23 summarizes the final model that was developed for each of the Y-OQ and Y-OQ SR scales. Social Companionship was a significant predictor for only one of the scales, Informational Support for four of the scales, and both Instrumental and Emotional Support for two of the scales each.

Table 23

Variables Remaining in Final Regression Models

	Y-OQ (Parent)	Y-OQ SR (Self)
Total Y-OQ/Y-OQ SR		Sex***
		Income
	Instrumental Support*	Motivation to Attend*
		Social Companionship
		Instrumental Support*
Intrapersonal Distress		Age*
		Income*
	Instrumental Support*	Motivation to Attend
	*Emotional Support**	*Social Companionship*
		Instrumental Support**
Somatic	Informational Support***	Informational Support
	Emotional Support	
Interpersonal Relationships		Sex**
	None	*Social Companionship***
		Informational Support**
Social Problems		Sex*
	None	Motivation
Behavior Dysfunction	Instrumental Support	Sex*
Critical Items	Instrumental Support**	Sex**

	*Emotional Support**	Motivation*

Note. Items in italics indicate variables with a negative regression slope.

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Research Question #4

The previous research question focused on how social support networks developed by course end are related to program outcomes. While these measures provide a snapshot of the structures developed over the length of the course, it is also conceivable that changes in participants' social networks from mid-course to course end are also related to program efficacy for individual participants. That is, it is possible that the development, not just the existence of, social networks may explain the gains that occur.

First, change scores for each of the five social support measure were computed. All pair-wise correlations between the social support change scores and the Y-OQ and Y-OQ SR change scores were calculated. These results are shown in Table 24.

Table 24

Correlations of Parent's Y-OQ and Participant's Y-OQ SR measures with Social Support Change Scores

	Social Companionship	Informational Support	Instrumental Support	Emotional Support	Total Social Support
Y-OQ (n=22)					
Total	-.229	-.007	.429	.442	.272
Intrapersonal Distress	-.113	.058	.443	.461	.377

Somatic	-.319	.481*	.314	.484*	.390
Interpersonal Relationships	-.198	-.133	.279	.269	.089
Social Problems	-.151	-.082	.267	.209	.082
Behavior Dysfunction	-.150	-.237	.252	.223	.015
Critical Items	-.260	.068	.453	.443	.360
Y-OQ SR (n=22)					
Total	-.171	-.105	-.156	-.176	-.243
Intrapersonal Distress	-.086	-.052	-.106	-.046	-.055
Somatic	-.013	-.045	.019	-.265	-.202
Interpersonal Relationships	.010	-.251	-.051	-.188	-.207
Social Problems	-.228	-.134	-.109	-.225	-.326
Behavior Dysfunction	-.256	.099	-.294	-.081	-.212
Critical Items	-.221	-.185	-.111	-.210	-.308

* $p < 0.05$ level (2-tailed).

Changes in social support from mid-course to course-end have little relationship to program outcomes. The only significant correlation is between Informational (r = .481, p = 0.04) and Emotional Support (r = .484, p = 0.04) changes in the Somatic sub-scale. All other Y-OQ

change scores are not related to changes in social support. No changes in Y-OQ SR scores are significantly correlated with changes in social support.

Given the lack of significant bivariate correlations, partial correlations controlling for Sex, Income, and Motivation were determined for the social support change scores and the Y-OQ SR change scores. These results are shown in Table 25. Controlling for the three demographic variables, none of the social support change score measures is significantly correlated with any of the Y-OQ SR scales. Despite the significant differences between mid-course and course end scores determined for four of the five types of social support (all but Emotional Support), social support change scores offer little explanatory power.

Table 25

Partial Correlations of Participant's Y-OQ SR measures with Social Support Change Scores Controlling for Sex, Income, and Motivation

	Social Companionship	Informational Support	Instrumental Support	Emotional Support	Total Social Support
Total	-.006	-.030	-.170	-.262	-.112
Intrapersonal Distress	.263	.035	-.086	.018	.162
Somatic	.135	.053	.019	-.298	-.086
Interpersonal Relationships	.180	-.216	-.026	-.318	-.138
Social Problems	-.091	-.100	-.196	-.358	-.304
Behavior	-.315	.191	-.295	-.079	-.110

Dysfunction					
Critical Items	-.295	-.205	-.051	-.347	-.256

Chapter 5

Conclusions

This chapter will review the findings from the four research questions that guided this study:

1. What participant characteristics are associated with social interactions between participants?
2. Is there a relationship between a participant's social networks and his or her adventure program outcomes?
3. If a relationship exists between participant's networks and his or her program outcomes, what characteristics of participant's social networks lead to increased program efficacy for individual participants?
4. How are changes in participant's social networks over the adventure education experience related to program efficacy for individual participants?

Additionally, the chapter will discuss implications for professional practice that stem from the findings. The chapter will conclude with an overview of limitations of the research and suggestions for additional research.

Discussion

The following section provides an overview of the evidence brought to bear to answer each of the four primary research questions. First, a summary of the social support networks of course participants will be offered. Next, the effectiveness of the adventure therapy intervention will be discussed. Finally, each of the four primary research questions will be discussed in turn.

Network Characteristics.

The social network measures captured the relative centrality of each group member within the social support network of their respective program group. The proportion of social support ties for the Social Companionship scale was approximately twice that of the other three scales at both mid-course and course-end. The incidence of Informational, Instrumental, and Emotional Support ties was relatively similar at both points; however, the relative ranks of the three did change. At mid-course, participants indicated a greater number of Emotional Support ties, followed by Instrumental and Informational Support. At course end, Emotional Support had the lowest reported rates due to a relatively little change from mid-course. The other three types of social support each increased a significant amount with the greatest increase in the area of Informational Support.

The mechanism causing the changes in social support is unclear. The participants arrive at the program with no previous interaction, and thus no developed network, with the other members. Over the span of the first ten days of the program, participants develop relationships with other members. It is unsurprising that Social Companionship develops most fully during the early period of the course. Informational and Instrumental Support both continue to grow throughout the program, yet emotional support (which started relatively high) remains practically static.

Program Outcomes.

The Y-OQ and Y-OQ SR were used to assess psychological growth during the adventure therapy program. The mean of the parent pre-test scores on the Y-OQ global score was 89.2. The cut score differentiating treatment and community populations is 46, indicating that the participants pre-test scores were consistent with individuals in treatment. The mean of the parent post-test scores was 53.5 indicating that the average participant was still dysfunctional at the end

of the program. Russell (2003), studying the outcomes of similar wilderness therapy programs, found a mean change of 39.5 points on the Y-OQ. While the mean change in the Y-OQ scores (29.1) was statistically significant and greater than the Reliable Change Index of 13 points, the post-test scores were not below the cut-score and thus the average participant could be considered "improved" but not "recovered." A total of 47.8% of the participants were below the cut point at program end and 63.6% experienced a change of greater than 13 points; 36.4% experienced both an improvement of at least 13 points and had a Y-OQ score of 46 or less at program end. Similar statistically significant improvements were found in each of the six subscales.

The mean of the participant pre-test scores on the Y-OQ SR global score was 68.7. The cut score differentiating treatment and community populations is 47, indicating that the participants pre-test scores were consistent with individuals in treatment. The mean of the participant post-test scores was 53.9 indicating that the average participant was still dysfunctional at the end of the program. Russell (2003), studying the outcomes of similar wilderness therapy programs found a mean change of 18.2 points on the Y-OQ SR. While the mean change in the Y-OQ SR scores (16.3) was statistically significant it was not greater than the Reliable Change Index of 18 points. A total of 43.5% of the participants were below the cut point at program end and 47.8% experienced a change of greater than 18 points; 21.7% experienced both an improvement of at least 18 points and had a Y-OQ score of 47 or less at program end. Additionally, statistically significant improvement was found in the Interpersonal Relations, Social Problems, and Behavior Dysfunction subscales.

The great differences in the parent's and participant's reported changes are difficult to understand initially. It is possible that a response-shift bias is present with participants underestimating their level of dysfunction or parents overestimating the level of dysfunction.

Pearson's correlations were computed to determine the inter-rater reliability of the Y-OQ and Y-OQ SR scales at pre-test and post-test. The correlation for the pre-test global Y-OQ scores was $r(31) = .222$. The correlations for the individual scales ranged from $r(31) = .202$ to $r(31) = .365$. The correlation for the post-test global Y-OQ scores was $r(23) = .427$. The correlations for the individual scales ranged from $r(23) = .115$ to $r(23) = .575$. The increased reliability of scores at post-test suggests the presence of response shift, but does not provide evidence of which respondent is "shifting". The use of a retrospective pre-test would be one way to compensate for such an effect (Sibthorp, Paisley, Gookin, & Ward, 2007).

Research Question #1.

The first research question sought to determine which participant characteristics were associated with social interactions between participants. None of the demographic or Y-OQ pre-test scores were correlated with social support measures at mid-course and only one was correlated with social support at course end. Because of this, all possible participant dyads were studied to see if the demographic or Y-OQ pre-test could predict interactions between participants. The regression model used to predict the social support ties was non-significant. The data do not support the use of demographic variables to predict interaction between course participants contradicting typical instances of homophily in social support networks.

Research Question #2.

The second research question was to determine if there is a relationship between participant's social networks and his or her adventure program outcomes? The results of the regression analysis did not support a relationship between the global measure of social support and therapeutic growth as measured by both the parent and the participant. Similarly, the global measure of social support was not a good predictor of any of the Y-OQ or Y-OQ SR sub-scales.

The findings suggest limited applicability of the overall measure of social support for predicting even specific therapeutic outcomes.

Research Question #3.

The third research question attempted to determine if a relationship exists between specific types of social support developed by course-end and the participant's program outcomes. Models explaining improvement in the Y-OQ and Y-OQ SR based on the four social support measures and, for the self-report scores the relevant demographic controls, were tested. Greater improvements in the global Y-OQ scores were found in those with high levels of Instrumental Support. Improvements in functioning measured by the global Y-OQ SR scores were found in female participants, participants that were motivated to attend, and participants with high levels of Instrumental Support. The coefficients for Instrumental Support equate to 41.1 points on the Y-OQ and 45.3 points on the Y-OQ SR. While the 95th percentile confidence intervals are large due to the small sample sizes (+/-37 points each), the coefficient represents a possible change greater than twice the reliable change index for each scale. Thus, all other factors being equal, an increase of half of the possible instrumental social support ties would predict therapeutic growth greater than the reliable change index.

Predictors of outcomes by Y-OQ subscale were somewhat varied. Informational and Instrumental support were positively related to improvements in functioning for three subscales (Interpersonal Distress and Critical Items; and Somatic scales, respectively). Increases in Emotional Support were actually related to lower levels of therapeutic growth for two of the six subscales (Interpersonal Distress and Critical Items). After controlling for pertinent demographic variables, positive change on the Intrapersonal Distress scale was predicted by higher levels of Instrumental Support. Positive change on the Interpersonal Relationships scale was predicted by higher levels of Informational Support and lower levels of Social Companionship.

Research Question #4.

The final research question sought to determine how changes in participants' social networks over the adventure education experience related to program efficacy for individual participants? Initial bivariate correlations and partial correlations controlling for demographic variables showed little explanatory power for the changes in Social Support from mid-course to course-end.

Conclusions and Implications for Practice

The findings of this research suggest that specific forms of social support do have an impact on therapeutic growth. Although greater amounts of social support during the program do not always lead to greater functioning. Overall, the specific type of social support developed and the specific type of functioning seem to be much more important than global constructs of social support or functioning.

Of note is the inverse relationship between the amount of each type of social support and the "psychological depth" of each (Ringer & Gillis, 1995). Ringer and Gillis describe a variety of levels that groups involved in a therapeutic milieu may be operating at. These levels range from the "shallowest" amount on interaction and involvement which they term the *surface* level to the "deepest" which they term *universal*. The types of social support used in this study may be easily mapped onto these levels and form a similar pattern of depth. Social companionship would be the shallowest form of social support, while emotional support would be the deepest. Informational and instrumental support would be in the middle; though the ordering between these two could be debated.

Social companionship is the least "deep" type of social support and was found in 80% of all possible ties at course-end. Instrumental and information support both suggest medium levels

of depth and were found in 48% and 49% of ties, respectively. Finally, the deepest type of social support, emotional support, was found in only 40% of ties.

Of great interest is the somewhat surprising importance of instrumental and informational social support over social companionship and emotional support. Instrumental or informational support was positively correlated with increases in two-thirds of the outcome measures. Similarly, social companionship and emotional support were found to be negatively correlated with increases in functioning in one-fourth of the outcome measures.

These findings must be taken in context with the type of adventure program that was studied. Adventure programs are often distinguished based on the type of outcomes they seek to develop. While the program participants would be considered by the Y-OQ normative data as typical of residential treatment populations; the relatively short-term nature of the intervention places it at the shallower end of adventure therapy programs. Deeper adventure programs are often of longer duration or are facility-based instead of field-based.

For low-level therapeutic programs, such as the studied intervention, deeper levels of social support (i.e. emotional support) may not be necessary. However, for clients with higher levels of dysfunction, such support may be paramount. Similarly, relatively shallow connections as in social companionship may hinder the ties necessary for real change to occur.

A related pattern may exist for more traditional adventure education programs. Those programs with psychologically "shallower" outcomes may likely find that shallower forms of support (i.e. social companionship) are much stronger predictors of outcomes and that deeper forms of interaction (i.e. emotional support) are unnecessary or even counter-productive.

Also of interest was the connection between specific domains of functioning and the presence of specific types of social support. These findings are somewhat surprising given previous research. McKenzie's (2003) findings on the importance of group-based variables to

increased interpersonal skills suggest that it is through the group experience that individuals come to be a better group member. However, those psychological domains most tied to interpersonal relations (i.e. Social Problems and Interpersonal Relationships) are some of the least impacted by any type of social support.

Conversely, given the tie between individual level characteristics of the adventure experience and self-efficacy/self-concept found by Sibthorp (2003a) and McKenzie (2003) respectively, that group interaction may also impact intrapersonal characteristics. The data suggest that such intrapersonal domains (e.g. Intrapersonal Distress, Somatic, and Critical Items) are no less impacted by social support than are the interpersonal domains.

In the process of unpacking the larger construct of social support, outdoor educators should pay particular attention to both the various levels of social support as well as the types of therapeutic growth sought, especially as they seek to create interdependence amongst program participants and build supportive relationships appropriate to the program's goals.

Limitations and Future Research

The following section details problems that were encountered during the implementation of this research project. Three primary limitations and several areas for continued research are discussed are discussed.

While the sample size for the current research project is very low for traditional forms of statistical analysis, the use of purposive, small samples is very common across social network research. Regardless, the current sample does not provide the necessary statistical power to tease out the complex relationship that likely exists between social support and adventure therapy program outcomes. However, the strength of the findings suggests that the overall effect of social support is quite large as the relationship between social support and therapeutic outcomes was

obvious with even this meager sample. Despite the relatively large confidence intervals, the sizes of the regression coefficients suggest that social support is highly substantively significant.

An additional concern stems from the study's response rates. Overall participation in the research study was very high with parents participating at a rate of 97% and course participants at a rate of 86%. However, completion rates of specific parts of the study were much lower due to difficulties administering instruments. Two of the ten groups (20%) were not administered the mid-course social network generator. Three groups (30%) were not administered the end-of-course instruments. Those missing the end-of-course administration were mailed the instruments by the therapeutic program. The response rate for these individuals for the end-of-course instruments was 29%. Complete outcome data was available from 62.9% of parents and 71.9% of participants. Overall response rates were greater than Russell's (2001) who worked with similar therapeutic programs. Russell had an overall participation rate of 83% and full outcome measures from only 40% of parents and 56% of program participants who agreed to participate in the study.

While the participation rates could represent a moderate amount of selection bias, the missing data attributed to administration problems would suggest that these data points are missing at random. To test if a difference exists between those who participated fully and those who participated only partially, an independent samples *t*-test was used to compare the Y-OQ global pre- and post-tests, the Y-OQ SR global pre- and post-tests, and the Global Social Support at mid-course and course-end. There were no significant differences found between the fully participating and partially participating groups on the Y-OQ pre-test ($t(33) = 0.940$, $p > .05$) or post-test ($t(21) = -1.527$, $p > .05$), the Y-OQ SR pre-test ($t(30) = -0.465$, $p > .05$), or the Total Social Support at mid-course ($t(25) = 1.767$, $p > .05$) or at course-end ($t(21) = -0.329$, $p > .05$). The Y-OQ SR post-test was not examined as no participants completed only the post-test. The

lack of statistically significant differences between the fully-participating and partially-participating responses suggests limited influence of non-response bias.

As this work supports both the empirical use of network measures and the theoretical work of Walsh and Golins (1976) linking social support and program outcomes in adventure education programs, further work is necessary to investigate the types (or shapes) of social support structures or networks (not just amounts of social support) between group members that maximize participant growth. For example, Walsh and Golins (1976) suggest that group size should be large enough to have diversity of opinion within the group, but not be so large that cliques form. In the case of such small groups, as is common across many adventure education programs, is it important for each individual to interact equally with every other individual as the results of this study suggest? It is possible that with larger groups (i.e. bigger than the groups of 3-5 participants used in this study) that more connections may not always be related to greater programmatic gains. In larger groups, it is possible that exceptionally strong support from a small sub-section of the group could be sufficient to allow growth, thus refuting Walsh and Golins' admonition against cliques. Also, many adventure therapy programs use a form of "rolling" admissions (known as a continuous flow model) in which participants begin and end the program individually as opposed to at the same time. It is unclear how the dynamic nature of group membership in such programs would impact the findings from this particular study. Future studies, using valued network ties and increasingly diverse program groups would be able to delve into these questions.

Another limitation of this sample size, coupled with the relatively dense social support networks, was that only degree measures of centrality were reasonable to use. Larger, less dense networks (as was likely with the initial data collection site) would allow for further exploration

of the impact of second and third level network connections through the use of closeness and betweenness measures of centrality.

The social support measure used in this study included both in-degree and out-degree measures of social support. This measure should be "unpacked" as the giving and receiving of social support likely provide different opportunities for change. Similarly, the availability of peer's responses could provide opportunities for studying the reciprocity of ties and thus could be used to provide more realistic views of the true social support networks than could the self-reports alone.

Additionally, this work has focused on understanding how individual's (egocentric) social support networks impact program outcomes. Additional research is necessary to determine if sociocentric measures of social support networks, meaning characteristics at the group versus individual level, have similar impacts. Research comparing different shapes of network would allow scholars to see if dense networks lead to greater average gains within groups as well as understand how network formations such as core/periphery and other sub-group structures impact outcomes. Ultimately, such group-level structure may explain a greater amount of variation in program outcomes.

This project has focused exclusively on the role of peer social support and has not included the role of the instructor/therapist. Harper (2007) found that therapeutic alliance had no impact on course outcomes in similar adventure therapy programs, but he measured therapeutic alliance in the same way that more traditional forms of therapy would do so. It is possible that the relationships formed between client and instructor/therapist are different in a field-based setting and, thus, the development of appropriate types of social support in the relationship between client and therapist may impact the therapeutic alliance and thus the therapeutic

outcomes expected, although this effect is likely moderated by social support from fellow participants.

Finally, this research has focused on a specific sub-set of adventure education programs with therapeutic goals. As described earlier, it is quite possible that the findings of this study are unique to adventure therapy programs and that other types of adventure education programs would be impacted substantially differently by participant social support.

Research on adventure education programs, such as those that use the Outward Bound model, has historically focused on establishing the effectiveness of such programs. Recent research has concentrated the focus on process factors beyond a solitary focus on outcomes. Such work must continue and improve. For instance, McKenzie (2003) and Goldenberg et al. (2005) each relied exclusively on participant perceptions of how outcomes are achieved. While beneficial, such self-reports are a limited tool. Instead, adventure education scholars must find ways to implement both innovative research designs and specific outcome measures tied to program goals. Such continued research will distinguish how course design is tied directly to intentional course outcomes and provide better rationales for why certain participants/clients should participate in certain programs.

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Appendix A-Parental Permission Form

Title of Research	**Social Interaction in Adventure Programs**	
Name of Researchers	**Jeff Turner,** Principal Investigator	**Dr. Gwynn Powell,** Faculty Advisor
Phone Number	**(706) 542-5064**	**706-542-4332**
Email Address	**turner15@uga.edu**	**gpowell@uga.edu**
School Address	**University of Georgia, Department of Counseling and Human Development Services Ramsey Center, Athens GA 30606**	

My child is being asked to participate in a research study. Participation is voluntary. I can refuse to allow my child to participate and can withdraw my child from participation without any penalty or any loss of benefits to which he or she is otherwise entitled. Even if I give permission for my child to participate, my child can refuse to participate and can quit at any time. I can request to have the results of the participation, to the extent that it can be identified as my child's, removed from the research records or destroyed.

The purpose of the study is to determine the impact of social interactions on the effectiveness of an adventure therapy program. There are no direct benefits to my child but the findings from this project may provide information on my child's therapeutic change from participating in this adventure therapy program. Additionally, the researcher hopes that the results of the research project will help to provide more effective adventure therapy programs in the future.

If my child volunteers to take part in this study, he or she will be asked to complete a short survey at the beginning, mid-point, and end of the adventure therapy program. Each survey should take approximately 10-20 minutes to complete. My child will be asked questions about illegal activities, drug use, and mental health. My child may skip any questions that he or she does not wish to answer.

The only people who can connect my child's responses to his/her identity are members of the research team. They will not disclose individually identifiable information about my child or provided by my child during the research unless required by law. For example, if my child reveals information concerning suicidal or homicidal intentions or child abuse, the researchers might be obligated to report this information to proper authorities. After participation, the researchers will code my child's records so that his or her name and responses will not be directly linked. Any records relating to my child's results or participation will be kept in a locked file which only the researchers can access. After data analysis is complete, the researchers will destroy the key that connects my child's identity and results.

This research study has minimal risks. Some of the potential risks are that my child may feel uncomfortable while answering some of the research questions. If my child feels uncomfortable answering any of the questions, he or she may discontinue at any time or choose not to answer the question. My child's participation in the program will not be affected if my child decides to stop taking part in the research. If he or she experiences any stress, anxiety or psychological discomfort as a result of participation in this research, I may also contact the investigator or his advisor for other referrals, assistance, and resources.

The researcher can be contacted for any further questions about the research, now or during the course of the project. See contact information for the researcher at the top of the page. Additional questions, concerns or complaints regarding your rights as a research participant or in the event of a research related injury should be addressed to The IRB Chairperson, University of Georgia, 612 Boyd Graduate Studies Research Center, Athens, Georgia 30602-7411; Telephone (706) 542-3199; E-Mail Address: IRB@uga.edu

I understand the study procedures described above. My questions have been answered to my satisfaction, and I agree to allow my child to take part in this study. I have been given a copy of this form to keep.

Jeff Turner		
Name of Researcher	**Signature**	**Date**
Name of Parent Guardian	**Signature**	**Date**

Please sign both copies, keep one and return one to the researcher.

Appendix B-Parental Consent Form

Title of Research	**Social Interaction in Adventure Programs**	
Name of Researchers	**Jeff Turner,** Principal Investigator	**Dr. Gwynn Powell,** Faculty Advisor
Phone Number	**(706) 542-5064**	**706-542-4332**
Email Address	**turner15@uga.edu**	**gpowell@uga.edu**
School Address:	**University of Georgia, Department of Counseling and Human Development Services Ramsey Center, Athens GA 30606**	

I am being asked to participate in a research study. Participation is voluntary. I can refuse to participate and can withdrawal from participation without any penalty or any loss of benefits to which I am otherwise entitled. I can request to have the results of the participation, to the extent that it can be identified as mine, removed from the research records or destroyed.

The purpose of the study is to determine the impact of social interactions on the effectiveness of an adventure therapy program.

There are no direct benefits to me but the findings from this project may provide information on my child's therapeutic improvement from participating in this adventure therapy program. Additionally, the researcher hopes that the results of the research project will help to provide more effective adventure therapy programs in the future.

If I volunteer to take part in this study, I will be asked to complete a short survey at the beginning and end of the adventure therapy program. Each survey should take approximately 10-20 minutes to complete. I will be asked questions about my child's activities and behavior including illegal activities, drug use, mental health. I may skip any questions that I do not wish to answer.

They will not disclose individually identifiable information about me or provided by me during the research unless required by law. For example, if I reveal information concerning suicidal or homicidal intentions or child abuse, the researchers might be obligated to report this information to proper authorities. After participation, the researchers will code my records so that my name and responses will not be directly linked. Any records relating to my results or participation will be kept in a locked file which only the researchers can access. After data analysis is complete, the researchers will destroy the key that connects my identity and results.

This research study has minimal risks. Some of the potential risks are that I may feel uncomfortable while answering some of the research questions. If I feel uncomfortable answering any of the questions, I may discontinue at any time or choose not to answer the question. If I experience any stress, anxiety or psychological discomfort as a result of participation in this research, I may contact the investigator or his advisor for other referrals, assistance, and resources.

The researcher can be contacted for any further questions about the research, now or during the course of the project. See contact information for the researcher at the top of the page. Additional questions, concerns or complaints regarding your rights as a research participant or in the event of a research related injury should be addressed to The IRB Chairperson, University of Georgia, 612 Boyd Graduate Studies Research Center, Athens, Georgia 30602-7411; Telephone (706) 542-3199; E-Mail Address: IRB@uga.edu

I understand the study procedures described above. My questions have been answered to my satisfaction, and I agree to take part in this study. I have been given a copy of this form to keep.

Jeff Turner		
Name of Researcher	**Signature**	**Date**
Name of Parent Guardian	**Signature**	**Date**

Please sign both copies, keep one and return one to the researcher.

Appendix C-Youth Assent Form
Social Interaction in Adventure Programs

My name is Jeff Turner.

We are asking you to take part in a research study because we are trying to learn more about how relationships between participants of an adventure therapy program affect their treatment.

If you agree to be in this study, you will complete a short written survey at the beginning, middle, and end of your treatment program. Your participation in this project will not affect your participation in the program. You will be asked questions about sensitive issues, such as illegal activities, and experiences with illegal drug. You may skip any questions that you do not wish to answer.

We won't tell anyone you took part in this study. The only person who will know your responses is me unless I'm required to share the information by law. For example, if you reveal information concerning suicidal or homicidal intentions or child abuse, I might have to report this information to the proper authorities

This research study has minimal risks. Some of the possible risks are that you may feel uncomfortable about answering some of the research questions. If you feel uncomfortable answering any of the questions, you may stop at any time or choose not to answer the question. If you feel stress, anxiety or discomfort as a result of doing this research, you may contact me or my advisor for assistance.

Because of this research, you may be able to learn how much you've changed by participating in this adventure therapy program.

Please talk this over with your parents before you decide whether or not to participate. We will also ask your parents to give their permission for you to take part in this study. But even if your parents say "yes" you can still decide not to do this.

If you don't want to be in this study, you don't have to participate. If you want to stop participating in this project, you are free to do so at any time. You can also choose not to answer questions that you don't want to answer. Remember, being in this study is up to you and no one will be upset if you don't want to participate or even if you change your mind later and want to stop.

You can ask any questions that you have about the study. If you have a question later that you didn't think of now, you can call me or call my teacher, Dr. Gwynn Powell, at (706) 542-4332 at any time to ask questions.

Signing your name at the bottom means that you agree to be in this study.

Sincerely,

Jeff Turner
UGA Department of Counseling and Human Development Services
(706) 542-5064

I understand the project described above. My questions have been answered and I agree to participate in this project. I have received a copy of this form.

_____

Signature of the participant/date

Please sign both copies, keep one and return one to the researcher.

Additional questions or problems regarding your rights as a research participant should be addressed to the Chairperson, Institutional Review Board, University of Georgia, 612 Boyd Graduate Studies Research Center, Athens, Georgia 30602-7411; telephone (706) 542-3199; e-mail address irb@uga.edu

Appendix D-Adult Consent Form

Title of Research	**Social Interaction in Adventure Programs**	
Name of Researchers	**Jeff Turner,** Principal Investigator	**Dr. Gwynn Powell,** Faculty Advisor
Phone Number	**(706) 542-5064**	**706-542-4332**
Email Address	**turner15@uga.edu**	**gpowell@uga.edu**
School Address:	**University of Georgia, Department of Counseling and Human Development Services Ramsey Center, Athens GA 30606**	

I am being asked to participate in a research study. Participation is voluntary. I can refuse to participate and can withdrawal from participation without any penalty or any loss of benefits to which I am otherwise entitled. I can request to have the results of the participation, to the extent that it can be identified as mine, removed from the research records or destroyed.

The purpose of the study is to determine the impact of social interactions on the effectiveness of an adventure therapy program.

There are no direct benefits to me but the findings from this project may provide information on my child's therapeutic improvement from participating in this adventure therapy program. Additionally, the researcher hopes that the results of the research project will help to provide more effective adventure therapy programs in the future.

If I volunteer to take part in this study, I will be asked to complete a short survey at the beginning and end of the adventure therapy program. Each survey should take approximately 10-20 minutes to complete. I will be asked questions about my activities and behavior including illegal activities, drug use, mental health. I may skip any questions that I do not wish to answer.

They will not disclose individually identifiable information about me or provided by me during the research unless required by law. For example, if I reveal information concerning suicidal or homicidal intentions or child abuse, the researchers might be obligated to report this information to proper authorities. After participation, the researchers will code my records so that my name and responses will not be directly linked. Any records relating to my results or participation will be kept in a locked file which only the researchers can access. After data analysis is complete, the researchers will destroy the key that connects my identity and results.

This research study has minimal risks. Some of the potential risks are that I may feel uncomfortable while answering some of the research questions. If I feel uncomfortable answering any of the questions, I may discontinue at any time or choose not to answer the question. If I experience any stress, anxiety or psychological discomfort as a result of participation in this research, I may contact the investigator or his advisor for other referrals, assistance, and resources.

The researcher can be contacted for any further questions about the research, now or during the course of the project. See contact information for the researcher at the top of the page. Additional questions, concerns or complaints regarding your rights as a research participant or in the event of a research related injury should be addressed to The IRB Chairperson, University of Georgia, 612 Boyd Graduate Studies Research Center, Athens, Georgia 30602-7411; Telephone (706) 542-3199; E-Mail Address: IRB@uga.edu

I understand the study procedures described above. My questions have been answered to my satisfaction, and I agree to take part in this study. I have been given a copy of this form to keep.

Jeff Turner		
Name of Researcher	**Signature**	**Date**
Name of Parent Guardian	**Signature**	**Date**

Please sign both copies, keep one and return one to the researcher.

Appendix E-Demographic Instrument

Thank you again for choosing to participate in this research study. Your assistance is both needed and appreciated. This survey is designed to find out more about your child's background. For each item, please check the appropriate box(es) or provide the appropriate answer to the following questions. If you have any questions, please ask the available staff member for help.

1) What is your child's age as of today?

[ ] 12
[ ] 13
[ ] 14
[ ] 15
[ ] 16
[ ] 17
[ ] 18
[ ] Age not listed (please specify) _____

2) Is your child

[ ] Male
[ ] Female

3) Is your child (check all that apply)

[ ] American Indian or Alaska Native
[ ] Asian
[ ] Black or African American
[ ] Other race (please specify) _____
[ ] Spanish / Hispanic / Latino
[ ] Pacific Islander
[ ] White

4) What is your total household income?

[ ] Less than $20,000 per year
[ ] $20,001-40,000 per year
[ ] Between $40,001-60,000 per year
[ ] Between $60,001-80,000 per year
[ ] Between $80,001-100,000 per year
[ ] More than $100,000 per year

5) Has your child previously formally been diagnosed with a mental health disorder?

[ ] No, no previous diagnosis
[ ] Yes, please specify previous diagnoses _____

6) Has your child previously received mental health treatment? (check all that apply)

[ ] No previous treatment
[ ] Out-patient treatment
[ ] In-patient treatment
[ ] Other adventure/wilderness program
[ ] Other (please specify) _____

7) Whose decision was it for your child to attend this outdoor therapeutic program?

[ ] Fully child's decision
[ ] More child's decision
[ ] Equal decision between child and parents/guardian
[ ] More parents/guardian decision
[ ] Fully parents/guardian decision

8) How much previous experience does your child have with adventure recreation activities (such as backpacking, rock climbing, ropes courses, canoeing or kayaking)?

[ ] No previous experienced
[ ] Limited previous experienced
[ ] Moderate previous experienced
[ ] Extensive previous experienced

For office use:			
Site:	Group:	Respondent:	Time:

Appendix F-Social Interaction Instrument

The following eight questions will ask you about the ways in which you interact with the other people in your group. The first four questions will ask you to check the members of the group that you seek out to interact with. The last four questions will ask you to check the members of the group that seek you out to interact with. For each item, check as many or as few people as you need.

Example: For instance, if you tend to hang out with Betty, Edward, and Florence, you would check each of the boxes under their names.

	Adam	Betty	Carl	Daphne	Edward	Florence
Who in the group ***do you go to*** in order to hang out with?		X			X	X

	Participant A	Participant B	Participant C	Participant D	Participant E	Participant F	Participant G	Participant H	Participant I	Participant J	Participant K	Participant L
1) Who in the group ***do you go to*** to hang out with?												
2) Who in the group ***do you go to*** for advice?												
3) Who in the group ***do you go to*** if you need something?												
4) Who in the group ***do you go to*** for emotional support?												
5) Who in the group ***comes to you*** to hang out with?												
6) Who in the group ***comes to you*** for advice?												
7) Who in the group ***comes to you*** if they need something?												
8) Who in the group ***comes to you*** for emotional support?												

For office use:			
Site:	Group:	Respondent:	Time: