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An Evaluation of a Supplemental Procedure Geared toward Prolonging Challenge Course Benefits

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An Evaluation of a Supplemental Procedure Geared toward Prolonging Challenge Course Benefits

by

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An Evaluation of a Supplemental Procedure Geared toward

Prolonging Challenge Course Benefits

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Challenge courses, also known as ropes courses, are a type of adventure education program designed to enhance intrapersonal and interpersonal functioning. Past research has indicated a number of short-term gains evolving from challenge course participation, such as increased self-esteem, cohesion, and teamwork (Bunting & Donley, 2002). However, longitudinal studies of challenge course participation have suggested that the gains are not maintained over time (Hatch & McCarthy, 2003) unless challenge course participation is supplemented by extensive follow-up procedures (Priest & Lesperance, 1994).

This study explored the effects of a brief supplemental procedure aimed at promoting the maintenance of challenge course gains over time. Seventy students representing six college student organizations were assigned to the intervention or control group. Intervention group members received information on their organizations' goals for participating in the challenge course immediately prior to

and one week following challenge course participation. Control group members participated in a challenge course but did not receive information on their organizations' goals. Measures of teamwork, cohesion, and personal and group effectiveness were given to participants immediately prior to and following the challenge course as well as two months after the course.

Results showed that both the control and intervention group experienced short-term gains in teamwork and personal and group effectiveness immediately following challenge course participation but did not maintain the gains over a two-month period. Exploratory analyses were performed to determine the effects of the intervention when a subgroup of intervention group participants who were members of a student organization that differed significantly from the other organizations was statistically removed. Results from these exploratory analyses indicated that while gains in group effectiveness and cohesion were not maintained for either the control or intervention group, increases in teamwork and personal effectiveness were maintained for the intervention group but not for the control group. The study concluded that the supplemental procedure demonstrated potential for facilitating the maintenance of challenge course gains over time, with further studies involving larger participant groups and improvements to the study design needed to determine the supplemental procedure's utility.

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CHAPTER ONE

Introduction

Challenge courses, also known as ropes courses, are a type of adventure education program. Adventure education programs are comprised of outdoor activities in a wilderness setting that are aimed at fostering intrapersonal and interpersonal growth (Hattie, Marsh, Neill, & Richards, 1997). Including such activities as backpacking, canoeing, and rock-climbing (Watts, Cohen, & Toplis, 1994; Anderson, Schleien, McAvoy, Lais, & Seligmann, 1997; Aubrey & McLeod, 1994; respectively), adventure education programs derive their benefits from calling on participants to take risks and make decisions on how best to complete activities in the face of uncertain outcomes (Ewert, McCormick, & Voight, 2001). Some of the benefits associated with adventure education programs are improved self-esteem, self-confidence, leadership skills, and teamwork (Hattie et al., 1997).

Challenge courses have become increasingly popular among groups seeking a relatively brief and accessible adventure education program (e.g., Bronson, Gibson, Kichar, & Priest, 1992). Typically located in a wilderness setting and lasting between four and eight hours, challenge courses consist of a

series of mentally and physically challenging activities that call on participant groups to work together to problem solve, allocate resources, and use one another for both physical and psychological support (Long, 1984). Following each activity, challenge course facilitators lead a processing period geared toward revealing the parallel between the challenge course experience and participants' real world experiences and facilitating the transfer of challenge course learning to participants' post-challenge course lives (Luckner & Nadler, 1995).

Past research has indicated a number of short-term gains evolving from challenge course participation (Bunting & Donley, 2002). Benefits to individual functioning include increases in self-efficacy, hope, self-esteem, and leadership and decreases in depression (Hart & Silka, 1994; Davis-Berman & Berman, 1989; Robitschek, 1996; Stopha, 1994; Chakravorty, Trunnell, & Ellis, 1995; respectively). Benefits to group functioning involve improved teamwork and cohesion (Bronson et al., 1992; Glass & Benshoff, 2002; Goldenberg et al., 2000; Hatch et al., 2003).

The fact that most studies address only the short-term impact of challenge course programs warrants concern. In the absence of longitudinal studies on challenge course participation, there is little indication that improvements in individual and group functioning shown immediately after the course generalize to participants' daily lives (Glass & Benshoff, 2002). The few studies on extended gains from challenge courses that have been conducted suggest that

gains in group functioning shown immediately after challenge course

participation do not persist at a follow-up testing period (e.g., Hatch & McCarthy,

2003). The lack of long-term maintenance of challenge course gains has been

linked to a deficiency in the transfer of challenge course learning to participants'

real life settings. In particular, it is believed that challenge course participants are

not given enough training and practice on how to generalize the skills that they

learn on the challenge course to their post-challenge course lives (Luckner, 1995).

In order to address this concern, Priest and Lesperance (1994) designed a

program in which challenge course participation was supplemented with

additional procedures geared toward prolonging the gains evolving from

challenge courses. The supplemental procedures consisted of weekly lectures and

other classroom-based activities focused on transferring challenge course

concepts and learning to participants' post-course lives. Priest and Lesperance

(1994) found that challenge course participants exposed to these supplemental

procedures showed maintenance of teamwork gains at a six-month follow-up

period whereas participants not exposed to the procedures did not. Therefore, it

appears that while challenge course participation per se may not ensure long-term

benefits, it is possible to produce long-term gains given the addition of

supplemental procedures.

However, the labor-intensive nature of the supplemental procedures

developed by Priest and Lesperance (1994) poses a problem. Many groups

participating in challenge course programs may not have the time or resources to devote to such extensive follow-up programming. Thus, the need for developing a less time-intensive supplemental procedure that leads to the same maintenance of challenge course gains produced by Priest and Lesperance's (1994) supplemental procedures is apparent

This dissertation study therefore aimed to evaluate the impact on group functioning of a challenge course in both the presence and absence of a brief supplemental procedure that sought to promote the maintenance of challenge course gains over time. The supplemental procedure was generated from "goal-setting theory," within the transfer of training literature (Yamnill & McClean, 1995). It consisted of group leaders generating and sharing goals for the challenge course with group members prior to their participation in the challenge course and group members receiving feedback on their challenge course participation following the course.

To assess the impact of the intervention on group functioning, measures of cohesion, team development, and personal and group effectiveness were administered to challenge course participants who received the supplemental procedure (intervention condition) as well as those who did (control condition). Participants in both conditions completed the measures at three testing periods: immediately prior to the challenge course, immediately following the challenge course, and at a two-month follow-up. It was expected that while both groups

would demonstrate an increase in group functioning immediately following the challenge course, only the intervention group would demonstrate maintenance of group functioning gains at follow-up.

This study thus sought to evaluate a relatively simple and expedient procedure designed to foster the long-term maintenance of challenge course gains. It was intended to contribute to the burgeoning area of outdoor experiential education research by providing empirical support for the utility of challenge course programs as viable means of producing long-term improvement in group functioning.

CHAPTER TWO

Review of the Literature

Challenge courses, also known as ropes courses, have become increasingly popular in recent years, with groups ranging from student and corporate organizations to groups of psychiatric patients and juvenile delinquents participating in them (e.g., Hatch, McCarthy, Dematatis, et al., 2003; Bronson et al., 1992; Chakravorty, et al.,1995; Davis et al., 1995; respectively). Spawned from outdoor experiential education programs such as Outward Bound, challenge course programs have been linked with gains in both individual and group functioning (e.g., Priest, 1992).

However, critics have noted that the dearth of empirical research on challenge course programs coupled with the dubious findings on their long-term impact render these programs less useful than their proponents suggest. The few long-term studies of challenge course participation that do exist suggest that, as suspected, challenge courses may be of limited long-term value (e.g., Hatch & McCarthy, 2003). Although interventions that follow challenge course participation with supplemental procedures geared toward prolonging the courses' positive effects have led to the maintenance of challenge course gains (Priest & Lesperance, 1994), the labor-intensive nature of these interventions detracts from

their appeal. Therefore, a need exists for the development of an alternative, less

time-intensive procedure designed to facilitate the maintenance of challenge

course gains over time

This literature review thus aims to provide a thorough description of

challenge course programs and to discuss relevant theories and research. The first

section of the review will introduce the theoretical basis of challenge course

programs in experiential learning. The second section will explore the nature of

group and organizational development, with a focus on the development of

college student organizations. In the third section, the use of challenge courses in

promoting organizational development will be addressed and it will be argued that

there is a need for challenge course programs to incorporate procedures geared

toward facilitating long-term challenge course gains. Finally, the fourth section

of this review will introduce a supplemental procedure aimed at promoting the

maintenance of challenge course gains and will describe the means of evaluating

this procedure.

EXPERIENTIAL LEARNING

Before addressing the challenge course experience, it is necessary to first

consider its foundation in experiential learning. Introduced in 1916 by John

Dewey, who suggested that education be an active, involved process rather than

something that is confined to traditional book learning (Hutchings & Wutzdorff,

1988), experiential learning is commonly described as "learning by doing" (Goldenberg et al., 2000). It is based on the idea that learning is best achieved by not just observing or reading about something, but by *doing* something with the phenomenon being studied. By putting the learner directly in touch with the subject of study, it is believed that the ensuing experience, followed by reflection on the experience, will result in learning (Keeton & Tate, 1978).

Although experiential learning is a seemingly simple concept, a number of components of an experience must be present in order for learning to occur. The components of an experience deemed essential for later learning include emotion and feeling, group interaction, and kinesthetic and physical activities (Bakal, 1995). In contrast to traditional classroom learning, in which students utilize their perceptual and symbolic abilities in order to make sense of the concepts on which the teacher lectures, experiential learning holds that affective and behavioral skills are equally important (Doherty, Mentkowski, & Conrad, 1978). By tapping into students' affective and behavioral experience prior to eliciting the abstract thinking more typical of learning, it is believed that students will find the experience to be at a more personal level and thus will be more motivated to learn.

In the mid-1970's, David Kolb created a model for experiential learning (Doherty et al., 1978). In this model (see Figure 1), a trajectory of learning experientially is presented. Essentially, the learner first has a concrete experience

which is followed by reflection on the experience, which eventuates in the formation of abstract concepts and generalizations, which leads to the testing of these concepts in new situations, which then leads to the creation of a new experience. At this point, the learning cycle starts again.

Figure 1. Kolb's Model of Experiential Learning

Concrete Experience

Testing Implications of Concepts in New Situations

Observation & Reflection

Formation of Abstract Concepts
and Generalizations
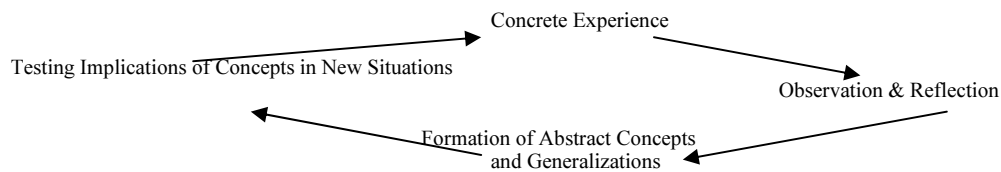
A few aspects of Kolb's model warrant mention. First, the model demonstrates an integration of "knowing" and "doing," with the "doing" consisting of having a concrete experience and the "knowing" referring to the development of abstract concepts based on reflections on the experience. Second, the model accounts for the reciprocal nature of knowledge and experience, with an experience leading to new knowledge, which in turn generates new experiences. Third, Kolb's model brings to light the importance of reflecting on, or processing, an experience. It is this ability to think about an experience that is considered imperative for transforming the experience into learning (Hutchings & Wutzdorff, 1988). Because reflecting on an experience is not something that people necessarily do instinctively, Kolb emphasizes that experiential educators

must teach learners how to reflect on an experience rather than assume that they will naturally do so.

Experiential learning can also be understood through the lens of various counseling theories (Carns, Carns, & Holland, 2001). For example, cognitive-behavioral theory (CBT) posits that thoughts, feelings and behaviors are connected and collectively influence psychological health (Young & Beck, 1982). In order for an individual experiencing psychological difficulties to get better, a CBT counselor would help the individual to isolate problems in each of these areas of functioning and attempt to create more adaptive patterns. This approach is similar to that of experiential learning, which instead uses the ideas of "reflecting" on "concrete experiences" in order to effect change. In a parallel way, CBT uses "thoughts" and "behaviors" to help individuals change from maladaptive to healthy functioning. Gestalt theory is also relevant to experiential learning theory. Specifically, Gestalt theory's focus on bodily and emotional self-awareness as well as on the "here-and-now" fits well with that of experiential learning, which has at its core processing concrete experiences that possess both kinesthetic and emotional components (Blanchard, 1992).

Combining experiential learning's focuses on kinesthetic activities and group interactions (Bakal, 1995), it is not surprising that a number of experientially-based group activities have been developed that are geared toward improving dynamics within a group. From the "tug-of-war" games characteristic

of team-building at summer camps to the "trust fall" activity employed at various corporate retreats, in which an individual closes his or her eyes and falls backward into the arms of his or her co-workers, experientially-based group activities are found in different forms in a variety of settings.

Outdoor Experiential Training Programs

Concentrating on those experiential activities that occur outdoors, *outdoor experiential therapy* incorporates experiential learning within the wilderness milieu. Referring to a variety of therapeutic interventions that occur in the outdoors (Ewert et al., 2001), outdoor experiential therapy dates back to the early 1900's. In one of the first documented cases of this form of therapy, tuberculosis patients showed both physical and psychological improvement after being moved from a hospital to an outdoor tent setting (Davis-Berman & Berman, 1993). This "tent therapy" was later implemented with psychiatric patients, who demonstrated similar improvements (Caplan, 1974).

A more proactive type of outdoor experiential therapy came in 1929 in the form of a therapeutic wilderness camp geared toward socializing campers' behavior (Dimock & Hendry, 1939). This early example of *wilderness therapy*, a type of outdoor experiential therapy characterized by using "wilderness-type" settings for a therapeutic purpose (Ewert et al., 2001), evolved into a larger-scale operation known today as Outward Bound. Founded by Kurt Hahn in 1941,

Outward Bound was developed as a month-long wilderness experience designed to promote physical and psychological hardiness among sailors who needed to survive harsh conditions at sea (Outward Bound, 2003a). Later adapted for use with non-military populations, Outward Bound was introduced to the United States in 1962 with the founding of the Colorado Outward Bound School (Outward Bound, 2003a). Today, Outward Bound operates a number of schools that serve both clinical and non-clinical populations and has spawned numerous programs at school, universities and other agencies that use its philosophies (Outward Bound, 2003a).

Wilderness therapy has expanded into a number of programs that vary in terms of duration, specific activities employed, and participant characteristics. Ranging in length from a few hours to a few months, wilderness therapy programs can be comprised of one or a multitude of activities. These activities range from backpacking and canoeing to rock-climbing, and challenge course participation (e.g., Watts et al., 1994; Anderson et al., 1997; Aubrey & McCleod, 1994; Davis et al., 1995; respectively). Similarly diverse are the groups that take part in wilderness therapy programs. These groups include chemically dependent adolescents, individuals with mental and physical disabilities, rape victims, welfare recipients, and outdoor aficionados (Kennedy & Minami, 1993; Anderson et al., 1997; Luckner, 1989; Arnold, 1994; Aubrey & McCleod, 1994; Watts et al.; respectively).

Given the prevalence of wilderness therapy programs, researchers have sought to understand which aspects of the wilderness experience are associated with positive outcomes. With regard to the most basic element of the wilderness experience, the setting, some contend that healing and attitudinal change evolve simply from being exposed to a natural environment. In fact, merely viewing a natural setting has been shown to have positive effects on wellbeing, as Ulrich (1981) found that looking at a photograph of a natural scene, in comparison to viewing a photograph of an urban scene, was associated with an increased relaxation and decreased sadness. Viewing actual scenes of natural settings has also been related to enhanced wellbeing, with Tennessen and Cimprich (1995) finding that college students with natural views outside their dormitory windows, as opposed to views of other buildings, showed increased attention and more effective daily functioning. Investigating the influence of being in a natural setting, Hartig, Mang, and Evans (1991) discovered that participants who walked along a stream showed increased happiness and lowered fatigue in comparison to those walking in an urban environment.   Collectively, these findings indicate that merely observing or being in a natural environment has restorative effects.

Despite evidence for the benefits of being in nature, most studies of wilderness therapy address the role of the specific activities employed (e.g., backpacking, canoeing, and challenge course participation) in facilitating improved wellbeing. Referring to the component of the wilderness experience

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known as *adventure therapy* or *adventure education*, these various outdoor activities are distinguished by their calling on participants to take risks and make decisions on how best to complete activities in the face of uncertain outcomes (Ewert et al., 2001). Through direct and purposeful exposure to these activities, adventure education aims to enhance intra- and interpersonal growth (Meyer & Wenger, 1998).

In a meta-analysis of outcomes in the adventure education literature, Hattie et al. (1997) found that participants exhibited both intra- and interpersonal growth after taking part in adventure education programs. Specific gains were found in the area of self concept, with participants exhibiting increased self-esteem, self-confidence, self-efficacy, and internal locus-of control. Gains were also shown in leadership, with increased conscientiousness, decision-making, teamwork, individual leadership, and time management evolving. Improvement in personality dimensions was also demonstrated in the form of increased assertiveness and emotional stability and reduced aggression. Finally, increased cooperation, communication, and social competence pointed to the positive impact of adventure education programs on interpersonal skills.

The Challenge Course

Challenge courses, also known as a ropes courses, are a type of adventure education program that has experienced a particular boom of late related in part to

their increasing popularity among corporate groups (Bronson et al., 1992). Due to challenge courses' relative brevity (four to eight hours) in comparison to other adventure education programs, which often take place over a period of weeks or months (Experience Based Learning, Inc., 2004), they have become an attractive option for those seeking brief team-building programs.

Challenge courses are composed of a series of mentally and physically challenging activities called "elements" that necessitate participant groups (usually not exceeding fifteen individuals) working together to problem-solve, allocate resources, and draw upon one another for both physical and psychological support (Long, 1984). A challenge course is split into "low elements," which are constructed on or near ground-level from cinder blocks, logs, and other similar materials, and "high elements," which are above the ground and typically utilize cables and ropes in addition to wood materials. Typically, the goal of low elements is to facilitate teamwork among group members whereas high elements are designed to encourage individual risk-taking. A sample element is the "T.P. Shuffle," which consists of a log that is suspended a few inches off of the ground on which the group members must "shuffle" themselves into a certain order. The facilitator may place constraints on the group, such as making some members wear blindfolds or having the group work in silence, in order to make the element more challenging. As with other low elements, the "TP Shuffle" is designed to instill cohesion and teamwork.

Following the completion of each element, the challenge course facilitators lead a processing period in which they encourage participants to discuss what they observed and experienced in attempting to complete the activity (Goldenberg et al., 2000). Through making observations about participants' actions on the element and eliciting reflections on how these actions relate to participants' actions in their typical environment, the facilitators use the challenge course activity as a metaphor for participants' interactions in their regular setting. For example, the facilitator may remark on the group's accomplishing its goal only after group members tried out a technique suggested by a usually quiet group member. The facilitator might then ask group members how this relates to their typical interactions when problem-solving as a group. Group members may then reflect on how the dominance of the more outspoken group members may silence this and other more reserved group members, therefore impeding the group's cohesiveness and problem-solving abilities. Thus, the processing period serves as an opportunity for participants to reflect on their interactions on the challenge course as they apply to their typical setting, thereby opening the door for improved communication, problem-solving, and interpersonal relationships when they return to that setting.

As Luckner and Nadler (1995) describe in "Processing Adventure Experiences: It's the Story that Counts," the aims of processing are to reveal the parallel between the challenge course experience and participants' outside

experiences, to reinforce awareness of the potential for change, and to facilitate participants' integration of challenge course learning into their post-challenge course lives. They warn that without this transfer of knowledge from the course to participants' lives, challenge courses are of limited long-term value. In this sense, the challenge course can be seen as similar to other therapeutic interventions, as both are geared toward producing long-lasting behavioral changes.

More specifically, both employ the use of metaphors to reveal and improve maladaptive interpersonal functioning. As described by the therapist and theorist Jay Haley (1971), a client will often describe problematic symptoms that are actually metaphors for larger, more complex issues. Conversely, a client may also use a metaphor or simile to emphasize or clarify how she or he is feeling. The role of the therapist is to help the client to change the metaphor in order to construct a more adaptive narrative, which in turn is believed to facilitate improved functioning (Meichenbaum, 1977). As Haley states, "All therapists, whatever their schools, are attempting to change a metaphor" (p. 222). Combining Haley (1971) and Meichenbaum's (1977) ideas with evidence that metaphors help concretize and assimilate learning and are thus a powerful learning aid (e.g., Evans & Evans, 1989), employing metaphors appears to be an effective tool for fostering interpersonal growth.

Regarding the use of metaphors in challenge courses, challenge course facilitators draw on metaphors to change less adaptive interactions into more adaptive ones and thereby promote enhanced interpersonal functioning among participants. For example, in processing, participants may discuss how their failing to complete an element due to disagreement on the best approach reflects their struggles in the workplace. Ideas for improving their group dynamics would then emerge. On a later element, the group might demonstrate a more adaptive approach to problem solving, such as group members working together to problem solve and successfully complete an element. Processing would then reflect ways of incorporating this more successful approach to problem solving into their regular workplace setting. Thus, metaphors are used to change and enhance group members' interactions on and off the course, as participants are taught how to employ the new, more adaptive metaphors of problem solving and teamwork when they return to their regular environment.

In terms of the value of challenge course participation, a number of positive outcomes for individuals and group benefits have been linked with these experiences. Identified individual benefits include increases in self-efficacy, hope, self-esteem, and leadership skills and decreases in depressed mood (Hart & Silka, 1994; Davis-Berman & Berman, 1989; Robitschek, 1996; Stopha, 1994; Chakravorty, et al., 1995; respectively). Although the research on group benefits is relatively scant, some studies have linked challenge courses with gains in team-

building, teamwork, and cohesiveness (Bronson et al., 1992; Glass & Benshoff, 2002; Goldenberg et al., 2000; Hatch et al., 2003). Collectively, these findings indicate that challenge course participation has benefits that extend beyond simply providing individuals with recreation, as some assert (e.g., Wagner et al., 1991).

GROUP AND ORGANIZATIONAL DEVELOPMENT

Since challenge course programs are often used as a means of facilitating group, team, and organizational development, it is necessary to explore the nature of organizational functioning and development in order to better understand the nature of the challenge course intervention. Focusing on work groups and organizations, which comprise the type of group that often partakes in challenge courses, it is helpful to address the characteristics of these groups before discussing the ways in which they develop and grow.

Unlike strictly social groups or organizations, groups composed of work team or organization members are set apart from others by their express purpose of achieving an organizational objective. Members of work teams are called on to work collectively toward some end, such as creating or distributing a product or solving a professional dilemma. In order to be productive, work groups must then be efficacious at both a group and individual level, with the individual worker showing both individual competency and the ability to work in a group (Goldstein, 1988; Kieffer, 2001).

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In considering the personal and professional dynamics among individuals in work groups, one must first recognize that group functioning is related to both individual and group behaviors. A useful lens for looking at the relationship between the individual and his or her group is provided by social learning theory. Defined as "theories of learning that typically emphasize a person's reciprocal interaction with the environment that involve observational learning, cognitive processes, and motivating beliefs" (Wade & Tavris, 1996; p. 275), social learning theories account for how an individual both influences and is influenced by his or her group. Applying social learning theory to work group development, Goldstein (1988) proposed that group members deal with their involvement in their group at both the individual and group level. He posits that in ascribing meaning to their group experience, group members use both an extraspective orientation, which considers the group as a whole, and an introspective orientation, which is concerned with individual processes (Goldstein, 1988). Thus, it becomes apparent that to understand the functioning of a group, one must look at the individual's views of the group as a whole as well as his or her role within the group.

Progressing to how individuals become a group, or how "the parts become a whole," a number of influences on group development emerge. One of the most obvious facilitators of group development is time, with groups becoming increasingly effective with more opportunities for group members to work

together (Smith, 1989). More specifically, Tuckman (1965) proposed a model of group development over time consisting of four stages: forming, storming, norming, and performing. In the "forming" stage, group members first identify the group tasks and form interpersonal relationships among themselves and with leaders. The "storming" stage is characterized by a period of conflict and anxiety in which the group contends with issues pertaining to group structure and direction as well as interpersonal difficulties. In the "norming" stage, the group develops norms of behavior, while "performing" denotes the fourth and final stage, during which the group can actually accomplish its tasks. As Tuckman (1965) describes, in the performing stage, "Interpersonal structure becomes the tool of task activities. Roles become flexible and functional, and group energy is channeled into the task. Structural issues have been resolved, and structure can now become supportive of task performance." (p. 396). The goal of organizational development is therefore to achieve the "performing" stage. By working through challenges and resolving the interpersonal difficulties evident in the earlier stages, the work group is then prepared for accomplishing its objectives.

Focusing on non-temporal aspects of organizational development, Weisbord (1976) proposed a model of group development specific to work organizations. Concerned with those components necessary for optimal organizational functioning, Weisbord (1976) identified six components of

organizations that influence the organizations' success: purpose, structure, leadership, interpersonal relationships, helpful mechanisms, and rewards.

"Purpose" is defined as the group defining what its objectives are. "Structure" refers to the division of labor among individuals, organized in such forms as specialists working together or multi-skilled work teams working together. "Leadership" refers to interpersonal style, rather than formal organizational structure, with characteristics of good leaders including such attributes as the ability to define purposes and resolve internal conflict. "Interpersonal relationships" encompasses relationships between people (e.g., among peers, between a boss and a subordinate), between groups doing different tasks, and between people and their technologies (e.g., computers and other equipment). "Helpful mechanisms" refers to the items and procedures that bind an organization together and facilitate team efforts, such as policies, meetings, committees, reports, and memos. Finally, "rewards" include those formal and informal incentives that promote certain behaviors in the work environment. They can take the form of concrete compensation for efforts, such as a salary or a bonus, or can appear as the underlying sense of being valued and recognized as important within the organization. Weisbord (1965) believed that problems in any one of these six areas would lead to difficulties within the organization and suggested that people use the "Six-Box Model" to diagnose and remedy these problems, thereby improving organizational functioning.

In addition to the components of effective organizational functioning described by Weisbord (1976), the construct of cohesiveness, also known as cohesion, is viewed as an essential characteristic of successful groups (Bakeman & Helmreich, 1975). Described by Carron (1982) as "the tendency for a group to stick together and remain united in the pursuit of its goals and objectives" (p. 124), cohesion then appears to encapsulate both the task-related nature of groups as well as the underlying social relationships that allow for groups' successful functioning (Yalom, 1995). Testifying to the importance of the cohesion construct, Bollen and Hoyle (1990) state, "the centrality of cohesion as a mediator of group formation, maintenance, and productivity has led some social scientists to deem it *the* most important small group variable" (p. 479). Due to the importance of cohesion, increased cohesion has been a common goal of those wishing to improve group performance (e.g., Carron, Widmeyer, & Brawley, 1985). In addition to cohesion, teamwork has also been associated with the development of well-functioning work groups (Hanson & Lubin, 1986) and has likewise been a target of corporations aspiring to improve employee performance (e.g., Bronson et al. 1992).

Narrowing cohesion and teamwork from general constructs to more precise components, researchers have identified a number of elements that relate to group development and success. For example, Brower (1989) addresses the importance of both the individual and the group being confronted by and

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subsequently working through crises in order for group development to occur. Related to the resolution of crises, problem-solving has also been delineated as a means of facilitating group development, as the very process of working toward a goal (i.e., solving a problem) has been associated with increased cohesion and, by extension, group development (Ewert & Heywood, 1991). Finally, interpersonal trust has also been identified as an integral aspect of group development, as it has been linked with positive attitudes, perceptions and behaviors among work group members and with overall organizational performance (Dirks & Ferrin, 2001).

College Student Organizations

Narrowing the focus of organizational development particular to a particular type of organization, the college student organization, it is useful to first consider some broader issues in college student development**.** Pascarella and Terenzini (1991) note that college is associated with, among other things, increases in students' freedom from others' influence, maturity in interpersonal relations, and intellectual orientation in problem solving. Some of these changes have been associated with college students' out-of-class experiences. Specifically, involvement in extra-curricular activities has been associated with enhanced leadership and interpersonal skills as well as increased social self-concepts (Pascarella & Terenzini, 1991). This has implications for students' post-college lives, as evidence shows that college graduates retrospectively perceive their

involvement in extra-curricular activities to be related to the development of the interpersonal and leadership skills that are important in career and occupational (Bisconti & Kessler, 1980). Thus, it follows that that involvement in extracurricular activities in college may set the stage for positive effects in individuals' later occupational lives.

College student organization membership is one type of extracurricular activity that has been associated with such positive outcomes (Pascarella & Terenzini, 1991). Described by Conyne (1983) as "formally sanctioned opportunities that allow students to associate and work together toward accomplishing common goals" (p. 394), college student organizations are considered "a significant aspect of student life on most college and university campuses in terms of their numbers, areas in which they function, the quantity of students participating in them, and the numbers of activities they sponsor" (p. 394). Their importance in a number of areas has been shown, evidenced in their role in promoting educational persistence and attainment, social self-concepts, and women's entry into sex-atypical careers (Winston, Bledsoe, Goldstein, Wisbey, Street, Brown, Goyen, & Rounds, 1997).

In terms of the development of college student organizations, Conyne (1983) applied Weisbord's "Six-Box Model" (1976) to the development of college student organizations and speculated on the similarity between corporate and college student organizations. Testing Conyne's theory, Winston et al. (1997)

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developed the "Student Organization Environment Scales" based on Weisbord's "Six-Box Model." Finding strong psychometric support for the appropriateness of the fit between the six components identified by Weisbord and the functioning of college student organizations, Winston et al. concluded that "Weisbord's [1976] model of organizational diagnosis seems to apply to college student organizations" (p. 427). Therefore, it appears that college student organizations are similar to corporate organizations in their organizational development and functioning. Given this resemblance, it follows that college student organizations encounter similar problems regarding organizational and group development as do corporate and other types of groups. Thus, ways of enhancing organizational functioning will next be addressed.

Enhancing Organizational Development

Given the role of cohesion, teamwork, and related components in group development and organizational performance combined with evidence for the proactive nature of team-building (Vogt & Griffith, 1988), it is unsurprising that organizations have sought training programs that will enhance these elements. These programs vary in both setting and content. Regarding the setting, some training programs occur on location in the corporate setting (e.g., Orpen, 1986), some take place in remote, wilderness-type settings (e.g., Bronson et al., 1992; Priest, 1996), and still others utilize both the wilderness and corporate

environments for their training (e.g., Priest & Lesperance, 1994). In terms of content, some programs employ didactic procedures, such as sensitivity training (e.g., Orpen, 1986), others utilize experiential activities (e.g. Bronson et al., 1992; Priest, 1996), and some incorporate both didactic and experiential education (Priest & Lesperance, 1994). Recently, corporate training programs that utilize challenge courses and other experientially-based activities in a wilderness setting, also known as corporate adventure training, have gained popularity (e.g., Bramwell, et al., 1997; Bronson et al., 1992).

APPLYING EXPERIENTIAL LEARNING TO ORGANIZATIONAL DEVELOPMENT

The Effectiveness of Challenge Course Programs

Despite evidence for improved group functioning following corporate adventure programs and, more specifically, challenge course programs (e.g., Bronson et al., 1992; Priest, 1996; Priest & Lesperance, 1994), some maintain that these programs are merely fads that provide little in the way of actual leadership and teamwork development (Wagner, et al., 1991). More specifically, the long-term effectiveness of these programs in facilitating gains in individual and group functioning has been questioned. Some contend that the purported gains stemming from challenge participation, typically indicated by increased scores on measures of group and individual functioning from pre-course to immediate post-course, are misleading. As Marsh, Richards, and Barnes (1986) propose, positive

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outcomes may result from artificially low pre-course scores relating to anxiety over doing the course coupled with artificially high post-course scores relating to group euphoria at completing the course.

However, even if challenge course gains are "real" rather than confounds of situational variables, the issue of the long-term effectiveness of challenge course programs remains. In fact, many have asserted that the short-term effectiveness of challenge courses is irrelevant and express concern that the likely dissipation of challenge course gains soon after the course renders the challenge course a relatively ineffective intervention (e.g., Goldenberg et al., 2000). Thus, the need for the study of the long-term impact of challenge course participation is apparent.

While there exists a lack of follow-up study in the majority of challenge course investigations, a recent study on the long-term impact of challenge course participation supports skeptics' concerns that challenge course gains are short-lived. Hatch and McCarthy (2003) utilized measures of group cohesion, group problem solving, and perceptions of group effectiveness to assess the impact of challenge course participation at three testing periods: immediately prior to the course, immediately following the course, and at a two-month follow-up. Results indicated that while groups demonstrated significant increases in scores on all three measures immediately following the challenge course, within two months the scores on each measure had receded to pre-course levels.

This preliminary evidence on the lack of long-term improvement in group dynamics supports critics' concerns that challenge courses may not be effective ways of promoting long term gains. In order to understand why long term gains are not being achieved, it is necessary to explore various explanations. One explanation is that the transference of challenge course learning to other settings is lacking. As Luckner (1995) states, "As more educational and therapeutic programs integrate outdoor-adventure activities into their array of available services, there is a need to explore ways to increase professionals' processing skills to generalize the learning from experience to other settings." (p. 176). In other words, more must be done to promote the transfer of challenge course learning to participants' post-challenge course lives.

Transfer of Learning and Transfer of Training Issues

To understand ways of improving the transfer of learning from the challenge course to participants' regular settings, it is first necessary to understand what, exactly, "transfer of learning" is. One way to understand "transfer of learning" is that it concerns the ability to call up previous learning at a later time, perhaps in a different context from that in which it was originally learned. Salomon and Perkins (1989) emphasize that while almost all learning involves some kinds of transfer, the short-term learning that is manifested in the regurgitation of facts that are soon forgotten exemplifies more of a "spillover"

effect than a genuine understanding of the material. Therefore, true transfer of learning is understood to be more as a mindful type of learning, resulting in the ability to call up previous learning at a later point in time and in a different context. Ways of promoting learning transfer from one context to another include the use of metaphor, simile, and analogy, with terms such as "it's like" and "it reminds me of" evidencing a cognitive linking of previously learned material to the present (Haskell, 2001).

To best understand the concept of "transfer of learning," it is helpful to identify the various types of transfer that exist. "Non-specific transfer" refers to our everyday experience of transfer, exemplified in our ability to go about our daily routines and obligations due to our previously having learned how to perform these various duties. "Application transfer" involves applying what one has learned (e.g., by didactic methods) to a specific situation, evidenced in the ability to successfully program a VCR after reading the instruction manual. "Context transfer" refers to applying learning from one situation to a contextually different situation, illustrated in student drivers' attempts to bring in learning from their driver's education course to their behind-the-wheel experiences (Haskell, 2001).

Other types of transfer include near, far, low road, and high road transfer. "Near transfer" describes the transfer of learning between situations that are similar, but not identical. This is exemplified in one's attempting to use one's

knowledge of roller skating when one learns to ice skate. "Far transfer" refers to transferring learning between related, but dissimilar situations, as occurs when students come to understand that lightning is essentially a "big spark" (Haskell, 2001). "Low road" transfer refers to learning that becomes automatic due to constant use, resulting in a relative ease in applying this learning to a new, but similar, stimulus. An example of this is when one applies one's knowledge of driving skills, which have become automatic due to consistent use, to learning how to drive a truck. Finally, "high road" transfer is characterized by "mindful abstraction" and is most easily understood as purposeful (i.e., not automatic) learning stemming from the use of concepts (Salomon & Perkins, 1989). This type of transfer is utilized often in educational settings, with diagrams and other learning models used to help students understand general concepts.

Regarding the types of learning transfer relevant to challenge courses and other types of outdoor experiential learning, it appears that high road transfer is the ultimate goal. Specifically, it is hoped that participants will be able to abstract the concrete experiences and learning from the challenge course (e.g., teamwork, trust-building) and apply these new concepts to their interactions in their regular lives. Challenge course learning transfer can also be considered far transfer, as participants must apply the team-building concepts learned on the course to their typical setting, such as their workplace.

Another lens for exploring the transfer of challenge course learning is provided by the "transfer of training" literature. Falling within the realm of human resource development (HRD), transfer of training refers specifically to an employee's ability to generalize the skills learned in training programs to the workplace and to maintain these skills over time (Yamnill & McClean, 1995). From the HRD perspective, training is considered to be of little value if it is not translated to workplace performance.

A few elements have been identified as essential for transfer of training. According to Holton's (1996) model, the factors affecting transfer of training are motivation to transfer, transfer climate, and transfer design. Motivation to transfer refers to employees' desire to implement the skills learned in training on the job. Theories that address transfer motivation include expectancy theory, equity theory, goal-setting theory, and identical elements theory (Yamnill & McLean, 2001). Expectancy theory proposes that employees will be more likely to enact training skills if they hold certain expectations about the outcomes (e.g., they will receive raises if they utilize the new skills). Equity theory holds that people are motivated by the belief that their on-the-job efforts will be fairly and equitably compensated (e.g., they will receive salaries comparable to a co-worker in a similar position with similar skills). Goal setting theory predicts that employees will be more motivated to transfer training if they are provided with goals and feedback regarding their performance. Finally, identical elements

theory holds that transfer is maximal when the training setting stimuli correspond highly to the conditions in the work setting (e.g., examples in training are germane to the employees' work).

Transfer climate involves the level of support found in the work environment for applying training skills. As Kozlowski and Salas (1997) suggest, a positive transfer climate involves such elements as recognition of the need for change and organizational openness to external influences. According to Rouiller and Goldstein (1993), a positive transfer climate is associated with the presence of "situation cues," or cues within the workplace that remind employees of opportunities to apply their newly learned skills, and "consequence cues," or feedback provided to employees following their attempts to utilize the skills learned in training.

Transfer design refers to conditions necessary within a training program for facilitating the transfer of training. One important design concepts involves the use of identical elements theory, as training programs that utilize stimuli and conditions that highly correspond with the workplace setting to which the trainees will return are seen as more likely to produce the transfer of training (Yamnill & McLean, 2001). From the transfer of learning framework, this type of design would be considered one that focused on the facilitation of near transfer, as the training environment and workplace environment would be highly similar. Conversely, other training designs may attempt to maximize far transfer, as the

workplace setting's dissimilarity from the training setting may call for a greater degree of abstraction of training concepts. To facilitate far transfer in training programs, it is suggested that trainees be encouraged to discuss different ways in which they can apply the training (i.e., process the training experience) and are given opportunities to utilize the new learning in a variety of contexts (Yamnill & McLean, 2001).

Incorporating Transfer Theories into Challenge Course Programs

In order for challenge course gains to maintained over time, it thus appears necessary to supplement the challenge course program with additional procedures aimed at facilitating the transference of learning from the challenge course to the participating group's usual environment. In an effort to do this, some educators have created additional components to the challenge course program in order to promote the maintenance of challenge course gains over time.

For example, Priest and Lesperance (1994) created a program in which challenge course participants underwent additional "supportive procedures" geared toward bolstering the teamwork gains evolving from challenge course participation. In this program, participants spent three days at a retreat that supplemented challenge course activities with lectures and other classroom-based activities that focused on ways of using challenge course learning and teamwork concepts in the workplace. Six months after the course, gains in teamwork had

been maintained for groups that received the supportive procedures but had receded to pre-course levels for groups that did not. Thus, although challenge course participation per se may not lead to long-term benefits, the maintenance of gains appears possible if the challenge course is accompanied by appropriate follow-up procedures.

Despite Priest and Lesperance's (1994) success in fostering long-term gains among challenge course participants, the labor-intensive nature of their intervention poses a problem. In reality, most groups participating in challenge courses spend only four hours on the course, making a three-day intervention impractical. Thus, the need for alternative procedures geared toward maintaining challenge course gains over time becomes paramount.

One approach would be to incorporate some of the tenets of transfer of learning and transfer of training theories into a different, less time-intensive supplemental procedure that would accompany challenge course participation. Of those tenets previously described, goal-setting theory, which refers to increasing the motivation to transfer training skills by 1) having the goals for training made explicit and 2) providing feedback to trainees regarding their performance (Yamnill & McLean, 2001), stands out as particularly promising for a number of reasons.

First, generating goals for the participant group is usually a part of the pre-course discussions between challenge course facilitators and the leader(s) of the

group that will be participating. Typically, challenge course facilitators try to get an understanding of what, in particular, a group wants to accomplish from challenge course participation (e.g., improved communication). By making these goals known to the group in an explicit way before the course, group leaders might increase group members' motivation to transfer the skills learned on the challenge course to their post-challenge course settings.

Second, the provision of feedback regarding the group's performance could be done with relative ease by sharing with participants positive feedback regarding their efforts on the challenge course. By providing participants with positive feedback on their performance in the challenge course training, one would likely bolster participants' motivation to transfer the newly acquired challenge course learning to their usual setting.

The implementation of supplemental procedures guided by goal-setting theory seems a potentially useful supplement to a traditional challenge course program. By incorporating this component of transfer of training theory, it seems that the "high road" transfer of learning from the challenge course to participants' typical setting will be more likely to occur. The end result of the long-term maintenance of challenge course gains would demonstrate that this less time-intensive supportive procedure could produce the same benefits as the previously mentioned more time-intensive procedures utilized in Priest and Lesperance's (1994) successful intervention.

OVERVIEW OF THE STUDY

This study therefore aimed to evaluate the long-term impact on group functioning of challenge course participation in both the presence and absence of supplemental procedures generated from tenets of "goal-setting theory," a component of "transfer motivation" within the transfer of training literature. Given evidence for the similarity between college student organizations and the groups that have composed many of the participant groups in challenge course research coupled with the presence of college student organizations participating in challenge courses at a nearby university, college student organization members were chosen to comprise the participant group. Measures of cohesion, team development, and personal and group effectiveness were utilized to assess group functioning at three testing periods: immediately prior to the challenge course, immediate following the challenge course, and at a two-month follow-up. It was expected that while participants receiving the supplemental procedures as well as those not receiving the procedures would demonstrate increased group functioning immediately following the challenge course, only those participants receiving the supplemental procedures would show maintenance of gains at follow-up.

It was hoped that this study would benefit the challenge course field by demonstrating the effectiveness of a simple and brief procedure geared toward prolonging the benefits of challenge course participation. In addition, it was

hoped that this study would contribute to the burgeoning area of outdoor experiential education research by providing support for the utility of challenge course programs, thereby promoting the awareness of these programs as a means of improving group functioning.

CHAPTER THREE

Methodology

RESEARCH AIM

The aim of this study was to determine the ways in which group functioning differed between treatment groups over time depending on the presence or absence of supplemental procedures following challenge course participation. It was hypothesized that group functioning scores at follow-up would stay elevated for challenge course participants receiving supplemental procedures (intervention condition) but would return to baseline levels for challenge course participants not receiving supplemental procedures (control condition).

PARTICIPANTS

The data source for the study was 137 students from Texas State University - San Marcos (TSU). They were members of six university-recognized college student organizations that participated in the TSU challenge course during the 2003-2004 academic year. The participating organizations were the Black Student Alliance (BSA), Men Against Violence/Network (MAV/Net), Lambda, Kappa Kappa Psi/Tau Beta Sigma (KKP/TBS); Phi Chi Theta (PCT), and the Air

Force Reserve Officer Training Corps (AFROTC). Five of the groups were social

and service organizations geared toward specific populations: African-American

students (BSA), gay/lesbian/bisexual/ transgender students (Lambda), students

interested in ending campus violence (MAV/Net), university band members

(KKP/TBS), and business majors (PCT). The AFROTC group differed from the

other organizations in that its purpose is to provide leadership training for students

preparing to become officers in the Air Force.

Forty-two percent of participants were female and 57% were male.

Participants' mean age was 21.10 (SD = 2.92) and their racial/ethnic breakdown

was 10% African-American, 2% Asian/Pacific Islander, 12% Hispanic/Mexican-

American, 56% White, and 7% Other. Their grade level was 18% Freshman,

17% Sophomore, 29% Junior, 20% Senior, 2% Graduate Student, and 1% Other.

Forty-four percent of participants had participated in a challenge course prior to

this one and 42% had not. The representation of participants by student

organization was 9% Lambda, 12% PCT, 16% KKP/TBS, 11% MAV/Net, 4%

BSA, and 48% AFROTC. (*Note*: Percentages may not add up to 100% due to

missing data).

Because the purpose of this study was to investigate the effects of

challenge course participation over time, only those participants completing the

assessments at each of the three survey administrations (n = 70) were included in

the primary analyses. (See "Results" for a further explanation of inclusion

criteria.) Participant attrition was accounted for in two ways. First, some participants were unavailable at one or more of the survey administrations. Second, some participants neglected to fill in their university identification number in the designated place on the survey, making it impossible to match their data at the different administrations. (See "Results" for an analysis of attrition effects.)

Demographics of the subgroup of 70 participants who participated in all three data collections were similar to the overall sample: their mean age was 20.59 ($SD = 2.20$) and they were 47% female and 53% male. Race/ethnicity identification for this subgroup was 13% African-American, 19% Hispanic/Mexican-American, 61% White, and 7% Other. The grade levels of the subgroup were 24% Freshman, 20% Sophomore, 31% Junior, 23% Senior, and 1% Graduate Student. Forty-seven percent of the subgroup had been on a challenge course previously and 53% had not. Finally, the breakdown of the subgroup by participating student organization was 14% Lambda, 16% PCT, 26% KKP/TBS, 10% MAV/Net, 6% BSA, and 29% AFROTC.

PROCEDURE

Approval from the Institutional Review Boards of both the University of Texas at Austin and TSU was obtained. Due to the presence of a follow-up test in this study, only organizations participating in the challenge course at least six

weeks prior to the end of the fall or spring semesters were eligible to participate in the study. This allowed for follow-up testing to occur prior to TSU's winter and summer vacations, as these breaks were deemed long enough to potentially alter the interpersonal dynamics within participating organizations upon students' return to school.

Once an organization leader had signed up his or her organization to participate in the TSU challenge course, this investigator met with him or her to describe the study. After the organization leader agreed for the organization to participate in the study, the investigator assigned the organization to one of two treatment conditions: intervention or control. Organizations were alternately selected for one of the two conditions based on the chronological order in which their leader signed up the organization for the challenge course. Specifically, the first organization participating in the challenge course was assigned to the intervention group, the next organization to the control group, the next to the intervention group, and so on. The intervention group was composed of members of organizations that received supplemental procedures in addition to the challenge course intervention. Members of organizations that participated in the challenge course but did not receive supplemental procedures comprised the control group.

The intervention group was composed of 48 participants from the Lambda ($n = 10$), KKP/TBS ($n = 18$), and AFROTC ($n = 20$) organizations. The control

group was comprised of 22 participants representing the PCT ($n = 11$), MAV/Net ($n = 7$), and BSA ($n = 4$) organizations. The number of participants in the intervention and control groups was lower than the desired number of 75 participants in each group. This was due to fewer than expected student organizations participating in the TSU challenge course program during the 2003-2004 academic year and to the study's limiting participants to members of organizations completing the challenge course at least six weeks prior to the semester's end.

The goal of 75 participants in the intervention and control group had been obtained by doing a power analysis of data from a previous study of TSU challenge course participation in which participants showed significantly higher scores on measures of group functioning from baseline to immediate post-test (Hatch et al., 2003). Specifically, on a measure of cohesion, power was found to be .92 at $p < .01$ when all 119 participants were included. When the number of participants was reduced to 75 with approximately the same effect size, power was found to be .75 at $p = .01$. Given that this study used the same cohesion measure with the same participant population, a power of .75 on the prior study was seen as reflective of the anticipated power in this study, leading to the desired participant number of seventy five for each treatment condition. The implication of a lower than desired n for intervention and control groups will be addressed in the "Discussion."

Intervention

In the pre-course meeting with the leader of organizations assigned to the intervention condition, this investigator asked the leader to share his or her goals for the organization. The leaders responded to the following questions: 1) What do you want your group to accomplish or improve through participating in the challenge course? and 2) What are some behaviors or ways of interacting that you hope that your group will show (more of) following participation in the challenge course? This investigator recorded these goals, which typically involved teambuilding, increased cohesion, and improved communication. These goals were later shared in both written (see Appendix A) and oral form with organization members immediately prior to their embarking on the challenge course. Based on goal-setting theory within the transfer of training literature (Yamnill & McLean, 2001), it was believed that making the goals of challenge course participation known to group members would increase the likelihood of members utilizing the skills that they learned on the challenge course when they returned to their regular organization setting.

On the day of the challenge course, participants in both treatment conditions participated in a four-hour, low-element challenge course. All organizations except the AFROTC completed the challenge course at the TSU University Camp in Wimberley. The AFROTC completed a portable challenge course set up on a campus playing field. The implications of the intervention

group being comprised of both traditional challenge course participants and portable challenge course participants will be addressed in the "Discussion."

Upon arriving at the challenge course, organization members agreeing to participate in the study completed a consent form (Appendix B) and a survey containing the group functioning assessments (pretest). Along with the assessments, intervention group participants were also given a sheet listing their leader's goals for the organization. After handing out the goal sheets, this investigator read aloud the goals and encouraged participants to "keep these goals in mind" as they participated in the course. Participants then began the challenge course.

Immediately following the completion of the challenge course, the assessments were again administered to the participants (posttest). In the week following the challenge course, this investigator met with organizations in the intervention condition at the organization's weekly meeting. At this meeting, participants were given a sheet containing their leader's goals for the organization and positive feedback on the organization's performance on the challenge course (Appendix C).

Participants in both treatment conditions completed the assessments approximately six weeks after participating in the challenge course (follow-up). At this time, they were also asked to complete a survey (Appendix D) that contained a question regarding their participation in the challenge course. The

survey for intervention group members included two additional questions concerning the impact of the supplemental procedure.

The Challenge Course

The challenge courses for all organizations in this study lasted four hours and were composed solely of low elements. All organizations except the AFROTC completed the TSU University Camp challenge course, located in a wilderness setting approximately 20 miles from the TSU campus. The AFROTC organization completed a portable course located on a playing field on the TSU campus. The elements selected for the AFROTC portable course were the same as or similar to elements utilized on the University Camp course.

Participating student organizations completed the course in groups of 15 or fewer. Those organizations consisting of more than 15 individuals were separated into smaller groups. For those organizations split into smaller groups, the order of the elements differed so that all groups could complete the same four elements within the allotted time. Although this led to some groups having to wait to start the next element if another group had not yet completed it, it allowed for all the groups within an organization to complete the same elements and thus achieve as similar an experience as possible on the course. Efforts were also made to control for the potential confounds generated by having different facilitators for the groups within an organization. In addition to the standard

training required of each TSU facilitator, facilitators met together prior to each course to plan the particular program for each group (e.g., deciding which elements to include). With each organization having as their general goal for the challenge course program improved teamwork and cohesion, the facilitators considered the specific issues of each organization in developing a plan that each facilitator followed when leading the activities and processing periods.

Each group began the challenge course with warm-up exercises and then advanced through a series of approximately four elements. Sample elements in this challenge course included the "Minefield" and the "TP Shuffle." During the Minefield, group members were divided into pairs and each person in the pair took turns leading and being led across an obstacle course. The person being led wore a blindfold and followed his or her partner's verbal instructions in order to avoid stepping on the obstacles, or "landmines," when proceeding to the finish line. Successful completion of this element was contingent on the leader providing clear instructions to his or her partner. In the "T.P. Shuffle," group members positioned themselves in a row along a log suspended a few inches off of the ground and then "shuffled" themselves into a different order according to the facilitator's instructions. In order to make the element more challenging, the facilitator sometimes placed constraints on the group, such as making some group members wear blindfolds or instructing the group to work in silence. As is typical

of low elements, the "Minefield," the "TP Shuffle," and the other elements in this course were designed to instill cohesion and teamwork in participant groups.

Following each element, which usually took about thirty minutes to complete, each group took part in a fifteen processing period during which the group's facilitator helped participants to reflect on the activity. Facilitators started out by asking participants what it was like to complete the element, including what worked well and what felt challenging. They then focused on particular aspects of the experience, such as how group members communicated, how they devised and carried out their plans for completing the element, and how they worked through challenges. After group members shared their perceptions, the facilitators asked them to draw parallels between their experience on the element and their experiences in their organizational setting. For example, participants were asked to generate ideas for how they might have improved their performance on the element (e.g., better planning, soliciting ideas from more group members) and for how this might be applied to specific actions that they could take to improve their group's functioning in their typical setting. At the end of the challenge course, facilitators led a final processing period in which participants discussed the themes learned on the challenge course and shared their plans for implementing the challenge course learning in their regular organizational setting.

MEASURES

To explore group functioning, the dimensions of group cohesion, team development, and personal and group effectiveness were assessed. These constructs were selected for study due to their reflecting the specific goals of the GOAL program (Texas State University, 2002) as well as for their encompassing the overall aims of challenge course interventions (e.g., Goldenberg et al., 2000). The assessment chosen to measure cohesion was the Perceived Cohesion Scale. The Team Development Indicator was selected to assess team development. Finally, the Personal and Group Effectiveness Scale was chosen to measure personal and group effectiveness.

Perceived Cohesion Scale (PCS)

The PCS (Appendix E) is a six-item scale designed to assess an individual's perceptions of cohesion among his or her group members (Bollen & Hoyle, 1990). An overall score is calculated by tallying the scores for the six items, with higher scores indicating greater cohesion. Originally rated on a seven-point Likert-type scale, the PCS was modified for this study to a 5-point, Likert-type scale with the following anchors: *strongly disagree, somewhat disagree, neither agree nor disagree, somewhat agree,* and *strongly agree*.

Originally constructed for use with large groups in sociological studies, the PCS defines cohesion via the two-dimensional construct of belonging and morale. Bollen and Hoyle (1990) performed a confirmatory factor analysis on the items composing the scale, and found that the belonging and morale items loaded moderately to strongly on their respective constructs, with factor loadings ranging from .57 to .86. Overall, the statistically significant chi square test and the goodness-of-fit indices suggested strong model fit, leading the authors to conclude that the PCS "has indicators with high reliability, validity, and some degree of invariance in different groups" (Bollen & Hoyle, 1990, p. 500).

Chin, Salisbury, Pearson, and Stollak (1999) later evaluated the PCS for use with smaller groups. Testing the PCS on groups of four or five group members, Chin et al. (1999) performed a confirmatory factor analysis and found that the items loaded strongly on their respective constructs of belonging or morale, with the loadings ranging in value from .70 to .96. A chi-squared difference test demonstrated divergent validity between the constructs, indicating that, while related, the constructs are distinct from one another. Internal consistency was shown to be strong for both the belonging and morale constructs, with Cronbach's alphas of .95 and .87, respectively. In this study, internal consistency for the PCS was found to be .96.

Team Development Indicator (TDI)

The TDI (Appendix F) is a10-item scale that measures how often one perceives various aspects of teamwork to be present within his/her group (Bronson, 1990). It is based on Tuckman and Jensen's (1965) five-stage (awareness, conflict, cooperation, productivity, and separation) model of organizational development over time and Kormanski and Mozenter's (1987) later model that specified tasks and outcomes relating to each of the previous model's stages. Bronson (1990) created the TDI by adapting Kormanski and Mozenter's (1987) model for use with corporate adventure training programs.

The TDI is a common outcome measure for studies of challenge courses and other adventure training programs (e.g., Bronson et al., 1992; Miller, 1997). It rates items on a 5-point Likert-type scale, with 1 signifying *strongly disagree* and 5 signifying *strongly agree*. The TDI has been shown to have an equivalent forms reliability of .95 (Bronson et el., 1992) and demonstrated an internal consistency of .96 in this study.

Personal and Group Effectiveness Scale (PGE)

The PGE (Appendix G) is a 20-item scale designed by TSU challenge course coordinators to assess challenge course participants' perceptions of their group's effectiveness on a variety of task-related dimensions as well as their personal effectiveness within their group (Tina Carter, personal communication).

Ranging from one (*strongly disagree*) to five (*strongly agree*) on a Likert-type scale, the PGE is comprised of items relating to such constructs as risk-taking, openness to feedback, conflict resolutions, and sense of purpose, with higher scores indicating greater effectiveness.

The PGE is split into "Organization" and "Self" subscales, with the former assessing perceptions of organizational effectiveness and the latter measuring perceptions of personal effectiveness within the organization (PGE-O subscale) as well as their personal effectiveness within their group (PGE-S subscale). Reliability analyses in this study yielded Cronbach's alphas of .96 and .97 for the PGE-O and PGE-S subscales, respectively.

CHAPTER FOUR

Results

STUDY DESIGN AND REVIEW OF HYPOTHESES

This study utilized a 2 x 3 repeated measures factorial design for its primary analyses. The between-subjects factor was treatment condition (intervention, control) and the within-subjects factor was time (pretest, posttest, follow-up). Separate 2 (condition) x 3 (time) repeated measures analyses of variance (ANOVA's) were performed for each group functioning variable in order to determine whether intervention and control participants differed from one another on their group functioning scores at different times.

A main effect for time was expected, with an anticipated condition by time interaction explaining the differences between control and intervention participants at different administration times. It was predicted that while both the intervention and control groups would show gains in group functioning from pretest to posttest, only the intervention group would show maintenance of these gains at follow-up. Specifically, it was expected that intervention participants would demonstrate higher scores at posttest and follow-up than at pretest whereas control participants would show higher scores at posttest than at pretest and

follow-up scores similar to pretest scores. Post-hoc pair-wise tests would determine whether these differences were significant.

SAMPLE CHARACTERISTICS

All analyses, except for an analysis of the effects of participant attrition, are based on the scores of those participants completing the group functioning measures at all three survey administrations. From this subgroup, only those cases in which respondents completed at least 75% of the items on each measure were included. Depending on the measure, n's ranged from 64 (22 Control, 42 Intervention) to 70 (22 Control, 48 Intervention).

RELATIONSHIPS AMONG THE GROUP FUNCTIONING MEASURES

The bivariate associations the group functioning measures with one another based on the pretest scores of participants who completed the measures at all survey administrations are provided in Table 1. The significant correlation ($r = .761$) between the TDI and the PCS demonstrated that cohesion and team-building were distinct but related factors in this study. Similarly, the significant correlation ($r = .618$) between the PGE-O and PGE-S showed that group effectiveness and personal effectiveness within the group were associated yet distinct constructs. Finally, the lower yet still significant relationship ($r = .489$)

between the TDI and PGE-O suggested a moderate degree of association between

team development and group effectiveness in this study.

Table 1. Intercorrelation Matrix for Group Functioning Measures at Pretest

	PCS	TDI	PGE-O	PGE-S
PCS	-			
TDI	.761*	-		
PGE-O	.163	.489*	-	
PGE-S	.226	.353	.618*	-

Note. * = $p \leq .01$. Correlations are based on *n*'s ranging from 68 to 70, depending on the measure. PCS = Perceived Cohesion Scale, TDI = Team Development Indicator, PGE-O and PGE-S = Personal and Group Effectiveness Scale - Organization and Self subscales, respectively.

PRIMARY ANALYSES

To assess the impact of the intervention on group functioning over time,

separate 2 (*condition*: intervention, control) x 3 (*time*: pretest, posttest, follow-up)

repeated measures ANOVA's were performed for each group functioning measure

(PCS, TDI, PGE-O, PGE-S). The between-subjects factor was condition and the

within-subjects factor was time. Table 2 displays means and standard deviations

for each measure.

Table 2. Means and Standard Deviations (in parentheses) of Group Functioning over Time

		Control Group	n	Intervention Group	n	Total Sample	n
	Pretest	4.780 (.279)		4.520 (.948)		4.602 (.806)	
PCS	Posttest	4.856 (.293)	22	4.729 (.686)	48	4.769 (.591)	70
	Follow-up	4.250 (1.357)		4.604 (.733)		4.493 (.976)	
	Pretest	4.333 (.548)		4.093 (.936)		4.168 (.837)	
TDI	Posttest	4.748 (.353)	22	4.575 (.610)	48	4.629 (.546)	70
	Follow-up	4.051 (1.120)		4.445 (.768)		4.322 (.904)	
	Pretest	4.316 (.457)		4.260 (.563)		4.279 (.562)	
PGE-O	Posttest	4.611 (.387)	22	4.616 (.476)	42	4.614 (.444)	64
	Follow-up	4.148 (.798)		4.470 (.764)		4.359 (.785)	
	Pretest	4.309 (.371)		4.309 (.680)		4.309 (.371)	
PGE-S	Posttest	4.576 (.372)	22	4.545 (.636)	46	4.555 (.562)	68
	Follow-up	4.193 (.771)		4.466 (.579)		4.378 (.654)	

ANOVA results for the PCS indicated a significant effect for time: $F(2, 67) = 4.398$, $p < .05$. Pairwise comparisons showed that while there was no significant difference between pretest and posttest scores, posttest scores were significantly higher than follow-up scores ($p < .05$). There were no significant effects for condition or for the condition by time interaction. Figure 2 illustrates the pattern of PCS means over time for the intervention and control groups.

Figure 2. PCS Means of Control and Intervention Participants over Time
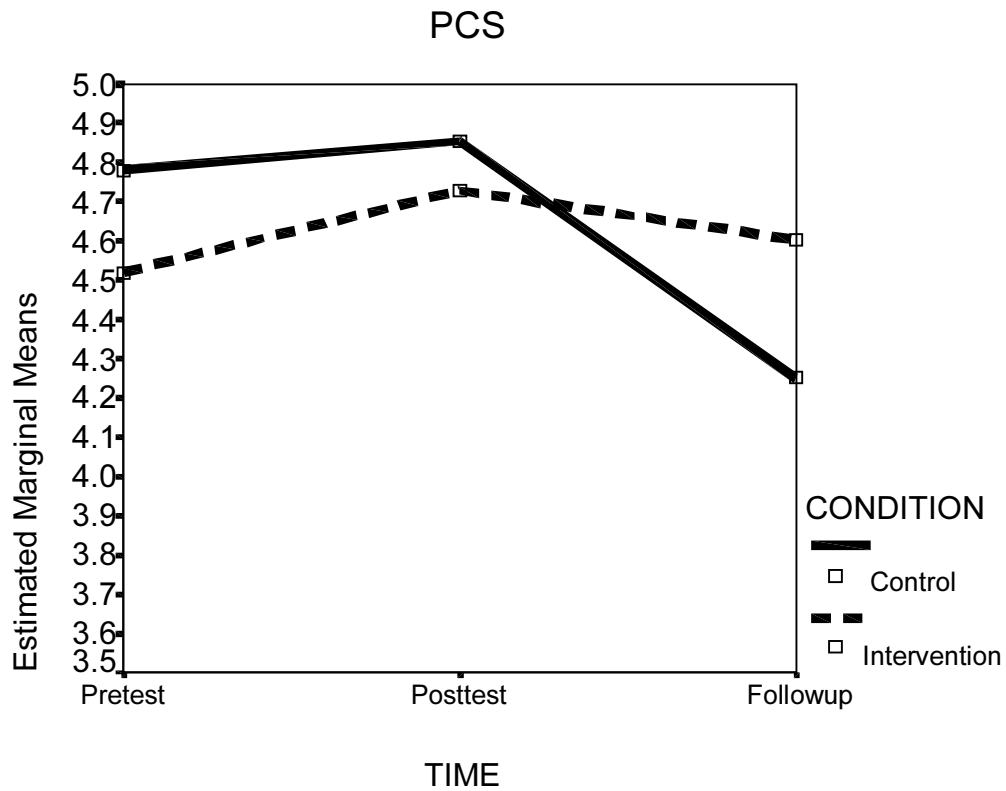
ANOVA results for the TDI demonstrated a main effect for time: $F(2, 67)$ = 14.573, $p < .01$. Pairwise comparisons yielded significantly lower pretest than posttest scores ($p < .01$) and significantly lower follow-up than posttest scores ($p < .01$). There were no significant effects for condition or for the condition by time interaction. Figure 3 depicts TDI means over time for intervention and control groups.

Figure 3. TDI Means of Control and Intervention Participants over Time
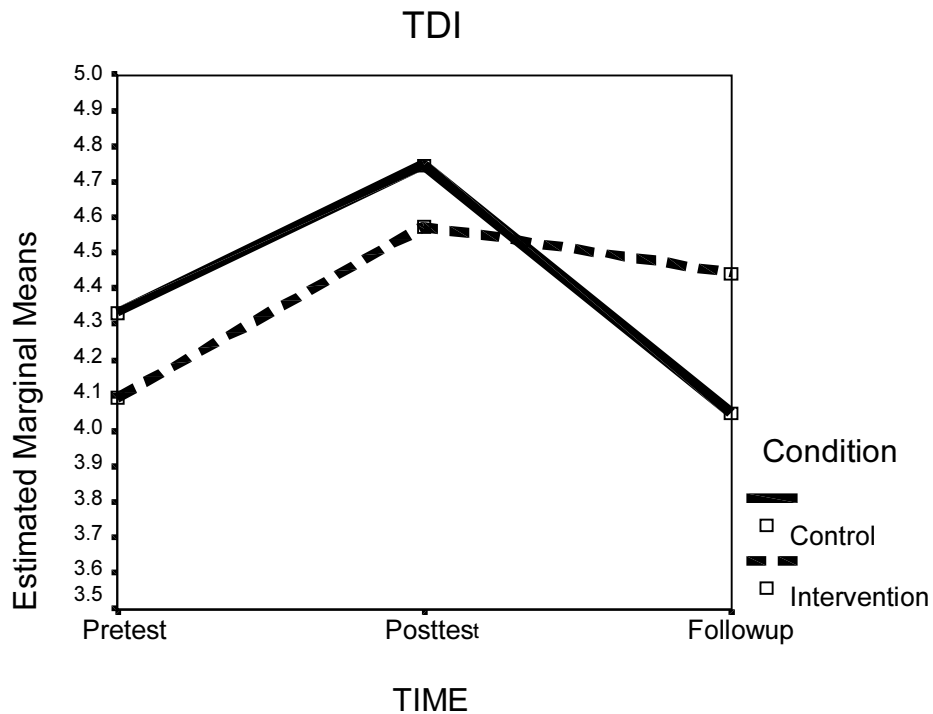
ANOVA results for the PGE-O indicated a main effect for time: $F(2, 61) = 14.976$, $p < .001$. Pairwise comparisons demonstrated significantly lower pretest than posttest scores ($p < .001$) and significantly lower follow-up than posttest scores ($p < .01$). There were no significant effects for condition or for the condition by time interaction. Figure 4 shows the PGE-O means for intervention and control groups over time.

Figure 4. PGE-O Means of Control and Intervention Participants over Time

ANOVA results for the PGE-S showed a main effect for time: $F(2, 65) =$ 8.072, $p \le .001$. Pairwise comparisons yielded significantly lower pretest than posttest scores ($p < .001$) and significantly lower follow-up than posttest scores ($p < .05$). There were no significant effects for condition or for the condition by time interaction. Figure 5 shows the pattern of PGE-S means over time for intervention and control groups.

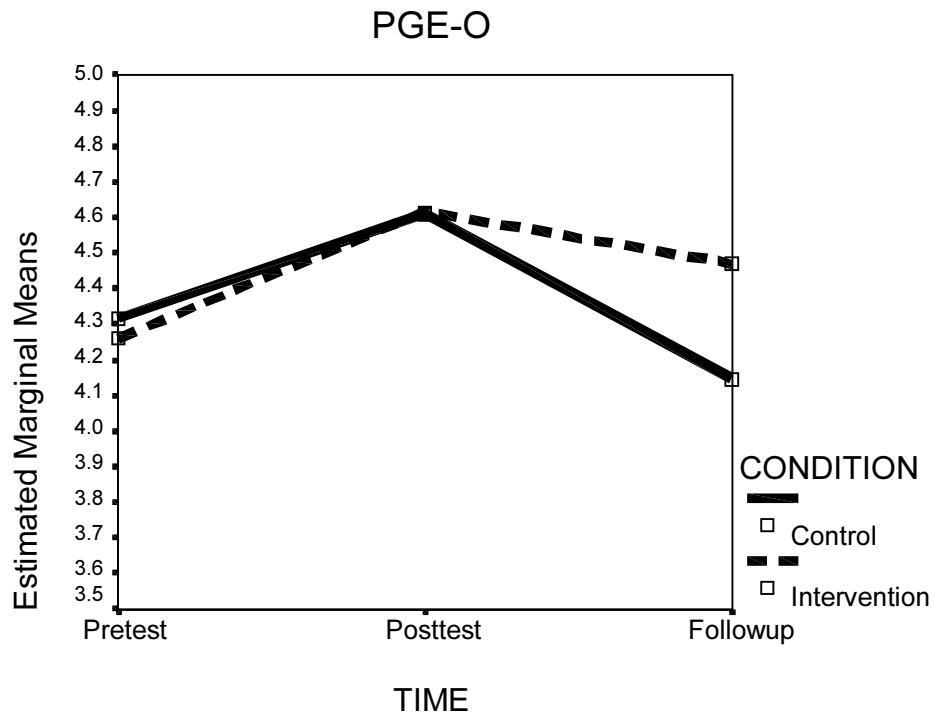**Figure 5. PGE-S Means of Control and Intervention Participants over Time**
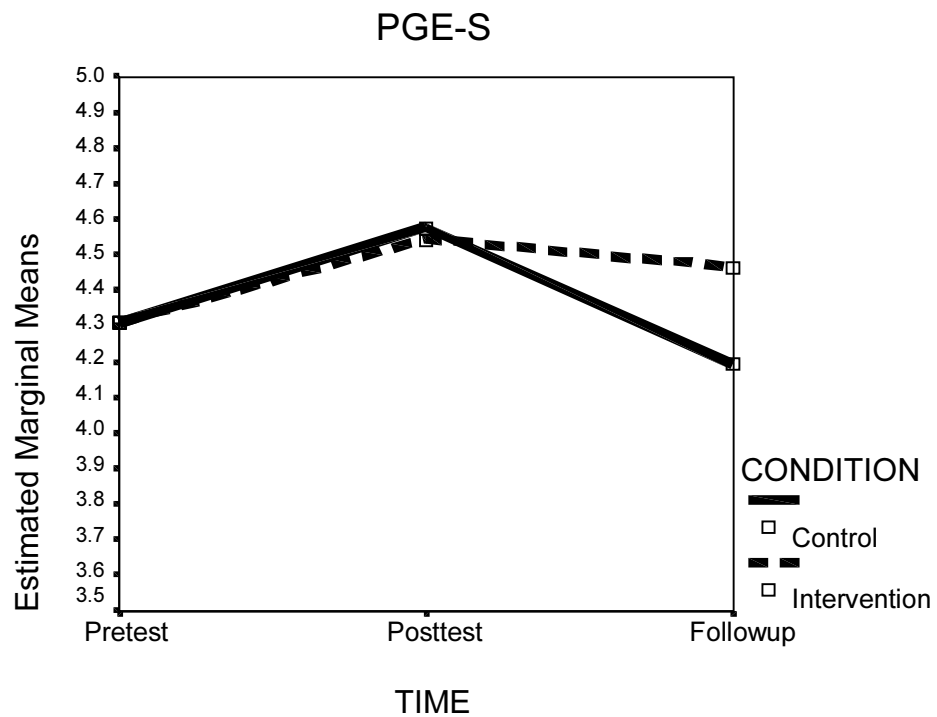
ATTRITION ANALYSIS

Although 137 individuals participated in the study, only 70 participants composed the group on whom the primary analyses were performed. This is due to the fact that only 70 participants completed the assessments at all three points in time (follow-up group). Of the remaining 67 participants, 36 participants completed the assessments at pretest and posttest only (dropout group), 5 participants completed them at pretest and follow-up only, 1 completed them at

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posttest and follow-up only, 10 completed them at pretest only, 11 completed them at posttest only, and 4 completed them at follow-up only.

To determine whether participants in these subgroups were differentially represented in the control and intervention groups, a chi-square test of independence was performed. Participants were divided into the following subgroups: follow-up ($n = 70$), dropout ($n = 36$), those completing the assessments at only one test time ($n = 25$), and those completing the assessment at only two test times (other than pretest and posttest only; $n = 6$). The last two categories were derived from combining the original subgroups because some had below the minimum number of participants ($n = 5$) necessary for a valid chi-square analysis. The chi-square test of independence was not significant, indicating that the subgroups were not differentially represented in the control and intervention groups. Another chi-square test of independence was performed comparing the follow-up group and the dropout group on their representation in the control and intervention groups. This test was not significant, suggesting that participants present at pretest and posttest but not follow-up and those present at all test times were equally represented in the control and intervention groups.

Attrition effects were also analyzed by comparing pretest and posttest means for the follow-up group and the dropout group for each measure (see Table 3 for means and standard deviations). Potential differences over time between these groups were assessed by a 2 (*group*: follow-up, dropout) x 2 (*time*: pretest,

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posttest) repeated measures ANOVA for each measure. A significant effect for time emerged on every measure, with posttest scores higher than pretest scores. There was no significant effect for group or significant group by time interaction on any measure. The lack of interaction showed that there were no systematic differences in responding on the measures between participants who were and were not present at follow-up. This suggests that the dropout group likely would have shown a similar pattern of results to the follow-up group had they completed the measures at follow-up.

Table 3. Means and Standard Deviations (in parentheses) of Group Functioning over Time for Follow-up and Dropout Participants

		Follow-up	*n*	Dropout	*n*	Total Sample	*n*
	Pretest	4.602 (.806)		4.470 (.594)		4.557 (.741)	
PCS	Posttest	4.769 (.591)	70	4.691 (.547)	36	4.742 (.575)	*106*
	Pretest	4.168 (.837)		4.268 (.744)		4.202 (.805)	
TDI	Posttest	4.629 (.546)	70	4.574 (.629)	35	4.611 (.573)	*105*
	Pretest	4.303 (.535)		4.408 (.698)		4.336 (.592)	
PGE-O	Posttest	4.632 (.438)	68	4.645 (.600)	33	4.636 (.493)	*101*
	Pretest	4.325 (.594)		4.460 (.638)		4.367 (.608)	
PGE-S	Posttest	4.567 (.558)	70	4.632 (.502)	32	4.587 (.539)	*102*

Attrition was also addressed by comparing the findings from the primary repeated measures ANOVA's, which used the traditional General Linear Model (GLM), with findings from repeated measures ANOVA's utilizing a Mixed Model (MM). Although GLM is more typically used, its method of handling missing data by list-wise deletion poses a concern, as only participants with information at each data point are included in the analyses. In this study, this meant that those

participants without data at pretest, posttest, and follow-up (67 of 137 participants, or 49% of the data source) were excluded from the analyses.

MM, however, is able to use information from *all* participants in the analyses, including those who have missing data at one or more of the test times. This is possible through a MM technique known as Maximum Likelihood Estimation (MLE), which uses any data that is present to estimate covariates and means, assigning greater weight to cases with data at more time points. In this study, this meant that participants with pretest, posttest, and follow-up data would have their information weighted more than, for example, participants with only pretest and posttest data, as the information from these participants is considered less reliable. Data from participants present at only one time point would be weighted the least and would be used only in obtaining means at that time point as opposed to in a comparison to means at other time points.

Given the ability of MM to utilize data from all 137 participants comprising the overall data source, this investigator performed 2 (*condition*: intervention, control) x 3 (*time*: pretest, posttest, follow-up) repeated measures ANOVA's using MM and compared these findings to the ANOVA's utilizing GLM. No differences emerged in this comparison, as both MM and GLM eventuated in a significant main effect for time and no effects for condition and for the time by condition interaction for each measure. Confirming the findings of the previous attrition analyses, it then appears that the overall findings would

not have differed had those participants who had missing data at one or more time points been present at all three time points.

DIFFERENCES IN GROUP FUNCTIONING AMONG ORGANIZATIONS AT PRETEST

Because the control and intervention groups were composed of different student organizations, potential differences in group functioning among the organizations at pretest were explored. A series of one-way ANOVA's were performed for each group functioning measure with *organization* (Lambda, PCT, KKP/TBS, MAV/Net, BSA, AFROTC) as the grouping variable. (See Table 4 for means and standard deviations.) Although no significant between group differences were found on the PCS, significant between group differences emerged on the TDI ($F(5, 69) = 2.834$, $p < .05$), the PGE-O ($F(5, 67) = 5.151$, $p \leq$ .001), and the PGE-S ($F(5, 69) = 4.862$, $p \leq .01$). For the TDI, the PGE-O, and the PGE-S, only AFROTC means differed from those of other organizations. On the TDI, AFROTC means were significantly higher than Lambda means ($p < .01$) and KKP/TBS means ($p < .01$). On the PGE-O, AFROTC means were significantly higher than those of Lambda ($p < .001$), KKP/TBS ($p < .001$), and BSA ($p < .01$). On the PGE-S, AFROTC means were significantly higher than those of Lambda ($p < .01$), PCT ($p < .05$), KKP/TBS ($p < .001$), and MAV/Net ($p < .05$).

Table 4. Pretest Means and Standard Deviations (in parentheses) of Participating Organizations on Group Functioning Measures

	PCS	n	TDI	n	PGE-O	n	PGE-S	n
Lambda	4.233 (.963)	10	3.683 (.623)	10	4.014 (.564)	10	3.961 (.740)	10
PCT	4.758 (.251)	11	4.227 (.459)	11	4.376 (.416)	11	4.360 (.237	11
KKP/TBS	4.528 (.960)	18	3.800 (.898)	18	4.037 (.476)	18	4.051 (.631)	18
MAV/Net	4.810 (.279)	7	4.389 (.730)	7	4.403 (.522)	7	4.238 (.557)	7
BSA	4.792 (.417)	4	4.525 (.486)	4	3.998 (.415)	4	4.294 (.365)	4
AFROTC	4.658 (.806)	20	4.561 (.929)	20	4.713 (.417)	18	4.770 (.404)	20

EXPLORATORY ANALYSES

Due to AFROTC participants demonstrating significantly higher scores at pretest than those of other organizations on the TDI, the PGE-O, and the PGE-S, and because AFROTC participants comprised 41% of the intervention group, a potential ceiling effect for the intervention group caused by elevated AFROTC scores at pretest was explored. With AFROTC scores so high at pretest, there may have been less room for improvement among intervention participants from pretest to posttest, which could have altered the effectiveness of the intervention. To evaluate this potential ceiling effect, the primary analyses comparing control and intervention group scores on the TDI, the PGE-O, and the PGE-S over time were re-run with AFROTC participants excluded from the intervention group (see Table 5 for means and standard deviations).

Table 5. Means and Standard Deviations (in parentheses) of Group Functioning over Time with AFROTC Participants Excluded from Intervention Group

		Control Group	*n*	Intervention Group	*n*	Total Sample	*n*
TDI	Pretest	4.333 (.548)	22	3.759 (.800)	28	4.011 (.751)	50
	Posttest	4.748 (.353)	22	4.314 (.665)	28	4.505 (.587)	50
	Follow-up	4.052 (1.120)	22	4.352 (.874)	28	4.220 (.990)	50
PGE-O	Pretest	4.316 (.457)	22	4.039 (.506)	27	4.163 (.499)	49
	Posttest	4.611 (.387)	22	4.468 (.488)	27	4.532 (.447)	49
	Follow-up	4.148 (.798)	22	4.403 (.850)	27	4.289 (.828)	49
PGE-S	Pretest	4.309 (.371)	22	3.9934 .6579	27	4.135 (.566)	49
	Posttest	4.576 (.372)	22	4.2987 .7071	27	4.423 (.592)	49
	Follow-up	4.193 (.771)	22	4.4310 .5723	27	4.324 (.672)	49

When the AFROTC participants were removed from the intervention group, the series of 2 (*condition*: intervention, control) x 3 (*time*: pretest, posttest, follow-up) repeated measures ANOVA's indicated a somewhat different pattern of results from the analyses that included AFROTC participants. On the TDI, a significant effect for time ($p < .001$) emerged, with pairwise comparisons revealing that pretest scores were significantly lower than posttest scores ($p < .01$) and that follow-up scores were significantly lower than posttest scores ($p < .05$). The interaction between time and condition on the TDI approached significance ($p = .059$). Post hoc pairwise comparisons showed that the intervention and control groups performed differently over time on the TDI, with control scores significantly lower at follow-up than at posttest ($p < .01$) while intervention scores did not differ between the two test times. Figure 6 illustrates the pattern of TDI

means over time for the control and intervention groups with AFROTC

participants excluded.

Figure 6. TDI Means over Time with AFROTC Participants Excluded from Intervention Group

TDI
(AFROTC Participants Excluded)
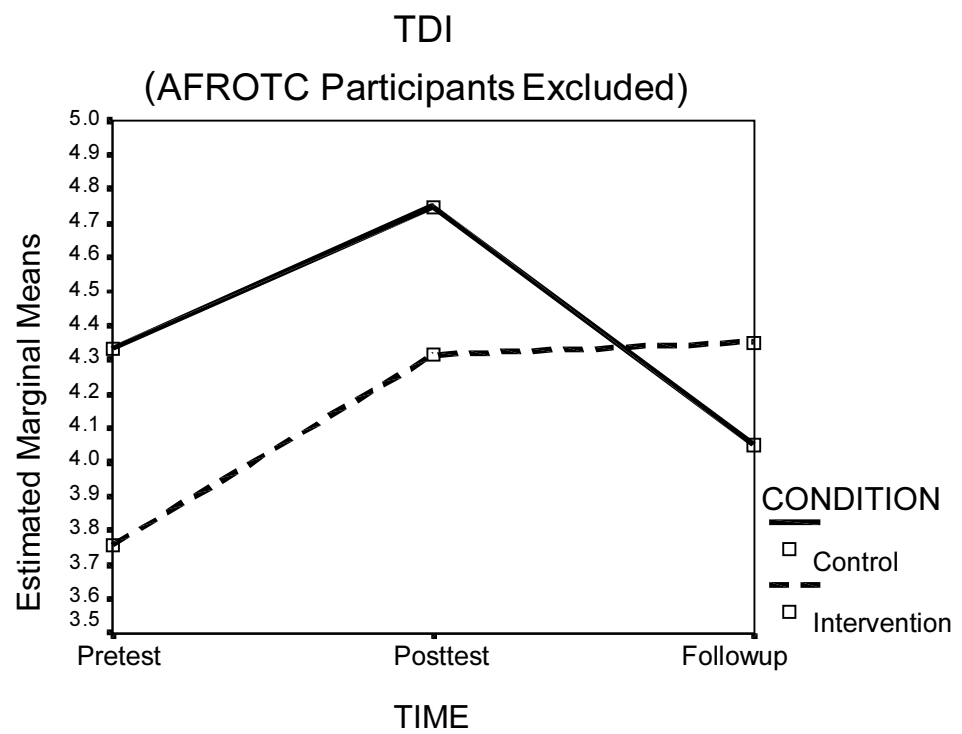
On the PGE-O, a significant effect for time emerged, with pretest scores significantly lower than posttest scores ($p < .001$) and follow-up scores significantly lower than posttest scores. No effect for condition or time by condition interaction were found on the PGE-O. On the PGE-S, a significant effect for time ($p < .05$) was shown, with posttest scores significantly higher than pretest scores ($p \leq .001$). The condition by time interaction was also significant for the PGE-S ($p \leq .01$), with post hoc pairwise comparisons demonstrating that follow-up scores were significantly lower than posttest scores for control participants ($p < .05$) but did not differ from posttest scores for interventi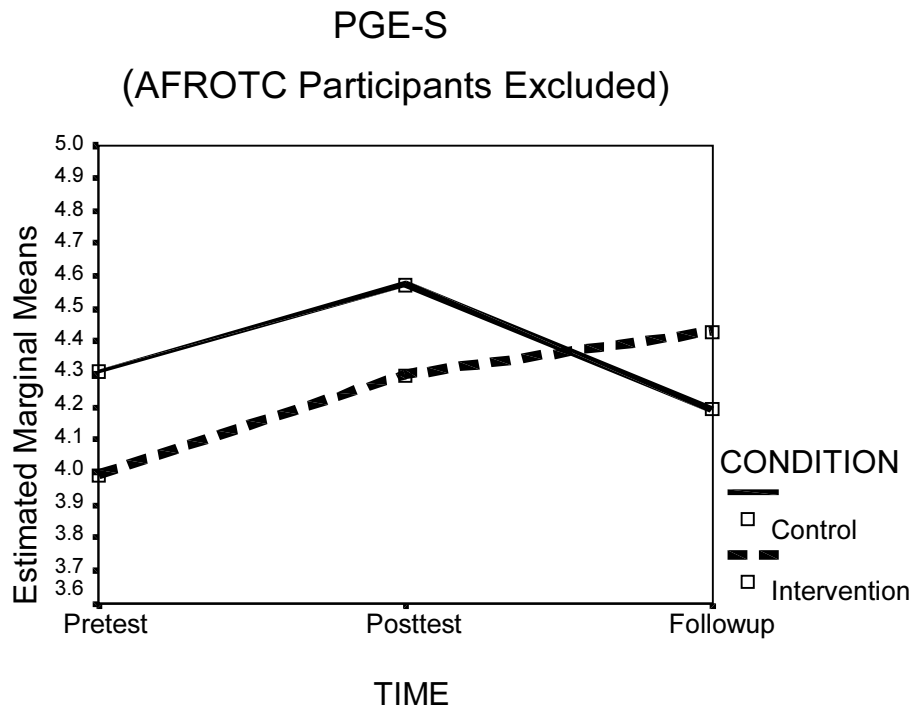on participants. Figure 7 shows PGE-S means over time for the intervention and control groups with AFROTC participants excluded.

Figure 7. PGE-S Means over Time with AFROTC Participants Excluded from Intervention Group

PGE-S

(AFROTC Participants Excluded)

SUMMARY OF QUALITATIVE FINDINGS

At follow-up, all participants were asked to respond to an open-ended question concerning the effects of challenge course participation on their organization. Intervention group participants were also asked to answer two additional questions regarding the impact of the intervention on their organization. (See Appendix D for a list of the survey questions.) Of the 80 participants (22 control, 58 intervention group) present at the follow-up

administration, 60 participants (10 control, 50 intervention group) responded to the question(s).

Responses to the question about the impact of the challenge course itself echoed findings from the quantitative analyses, with most comments from control and intervention group participants expressing improved group functioning stemming from challenge course participation. Comments generally reflected perceived improvement along the dimensions of communication, cohesion, problem-solving, and teamwork. Regarding communication, one participant stated "I feel more confident when addressing a group of people and I can communicate more effectively" while others wrote that group members "talk more and decide better" and "are better able to communicate." Gains in cohesion were expressed through such comments as "I think it brought us closer together" and "we have come together better and bonded." Problem-solving gains were also articulated: "The solutions to our problems are more specific and concise but are attained with less time" and "I think we understand the importance of solving problems together." Improved teamwork was expressed through such comments as "better teamwork" and "teamwork enhanced." One participant summarized the overall gains of the challenge course through the following statement: "I feel that working as a group in a removed situation helped bring to light potential in members as well as in self."

Although most comments reflected perceptions of improved group functioning following challenge course participation, a few suggested that the challenge course did not produce benefits. For example, one participant stated that the course did "not much at all" for the organization while another wrote "nothing really changed…[it was] just a good day of activities." In keeping with quantitative findings suggesting a possible ceiling effect resulting from participants showing high levels of group functioning at pretest, one participant stated, "We all worked very well together before this course but it was a lot of fun."

Responses to the questions regarding the impact of the intervention were more mixed, with comments relatively evenly split between those stating that the intervention facilitated the maintenance of challenge course learning and those expressing that it made no difference. Comments pointing to the efficacy of the intervention included the following: "it broke the skills down more," "it gave me a chance to know what went on," and "[it helped because] reflection is a key element to getting better." One participant wrote that the intervention was useful because "we were able to recall and understand what we learned on the ropes course." Others stated that it "kept us in tune with what our goals were" and "reminded me of the course and the skills learned."

Other comments suggested that the intervention was not effective in producing the transfer of challenge course learning to participants' regular

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organizational setting. Some participants expressed that the intervention was unnecessary and that the challenge course itself was all that was needed. One stated that the "ideas were well enforced that day [of the challenge course]" while another wrote, "I don't think [the intervention] really made a big difference to me personally. I'm good at using my deductive reasoning, so I caught it the first time." The perceived redundancy of the intervention was suggested in the following comments, "I'm pretty sure everyone already knew the things we focused on at the course" and "We interact very well without feedback forms." Other statements expressed resentment over receiving additional forms as part of the intervention, "We don't like forms. We have enough to fill out already." Finally, some comments suggested that the intervention may not have been potent enough to promote the transfer of challenge course learning to participants' regular setting. One participant stated that the intervention "was kinda [sic] vague" while another wrote, "[When the investigator] gave us the surveys, this is the only time the ropes course was mentioned. The ropes course hasn't taken time to convey what happened that day…"

Overall, the anecdotal findings seem in keeping with the quantitative results. Although most comments expressed perceptions of improvement in group functioning following the challenge course, only about half of the comments suggested that the intervention was effective in promoting the maintenance of challenge course gains. Comments endorsing the intervention

reflected the intended effect of the intervention aiding in the maintenance of challenge course learning over time, while comments refuting the intervention's utility pointed to weaknesses in the intervention and to the challenge course alone being responsible for producing lasting gains.

SUMMARY OF RESULTS

The primary analyses assessed differences in group functioning over time between participants in the control and intervention groups who were present at pretest, posttest and follow-up. A significant effect for time emerged on each measure, with expected increases from pretest to posttest shown on the TDI, the PGE-O, and the PGE-S. The significant decrease in scores from posttest to follow-up on each measure coupled with the lack of interaction between time and condition on each measure went against predictions that only control group participants would show lower scores from posttest to follow-up. However, the pattern of results for each measure suggested trends in this direction, as the control group showed a steeper decline in scores from pretest to follow-up than the intervention group for each measure.

Due to the AFROTC organization showing significantly higher pretest scores than the other organizations on three of four measures combined with its representing 41% of the intervention group, there was concern that the AFROTC group may have contributed to a ceiling effect for the intervention group and thus

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compromised the findings. When AFROTC participants were excluded from the analyses of group functioning over time, the expected interaction effect between condition and time were demonstrated for the TDI and the PGE-S. For both measures, the control group showed significantly lower scores at follow-up than posttest whereas the intervention group scores did not differ.

Finally, attrition analyses were performed to determine the consequences of using only participants with data at each of the three test times (follow-up group; $n = 70$) for the primary analyses and thereby excluding participants with missing data at one or more test times ($n = 67$). Chi square tests of independence indicated that participants with missing data and participants with complete data were not differentially represented in the control and intervention groups, suggesting that test condition did not play a role in participant dropout. Comparisons of pretest to posttest scores between follow-up participants and participants present at pretest and posttest but not follow-up (dropout; $n = 36$) yielded a similar pattern of results for each measure. This implied that the dropout participants would likely have shown a pattern of results from posttest to follow-up that was similar to that of follow-up participants had they remained in the study. Finally, mixed models analyses, which include participants with missing data in repeated measures analyses through a technique known as maximum likelihood estimation, were performed and compared to the previously run general linear model analyses, which exclude participants with data missing at

one or more time point. The lack of difference in the results between these

techniques suggests that, while definitely a limitation to the study, the relatively

high amount of missing data did compromise the overall findings.

CHAPTER FIVE

Discussion

Challenge course programs have become increasingly popular among corporate groups and other organizations interested in improving teamwork and cohesion among group members (e.g., Bronson et al., 1992; Glass & Benshoff, 2002). Although short-term benefits of these programs have been demonstrated (e.g., Chakravorty et al., 1995; Priest 1998), some contend that the programs are merely "one shot wonders" with limited utility over time (Bramwell et al., 1997). Unfortunately, there is a dearth of empirical research on challenge courses, in general, and on the long-term effects of the programs, in particular (Bunting & Donley, 2002). Studies on the long-term effects that do exist suggest that challenge course gains dissipate over time (e.g., Hatch & McCarthy, 2003), unless extensive supplemental procedures that reinforce the transfer of challenge course learning are present (Priest & Lesperance, 1994). This study expanded on previous research by evaluating the long-term effects of a brief supplemental procedure aimed at promoting the maintenance of challenge course benefits. The effects of an intervention developed from the transfer of training literature were examined by comparing the group functioning scores of challenge course participants who did and did not receive the intervention at three points in time:

immediately prior to the challenge course (pretest), immediately following the course (posttest), and at a six-week follow-up (follow-up).

The results show general support for the effectiveness of the challenge course program in producing short-term gains in group functioning and mixed support for the effectiveness of the intervention in maintaining challenge course gains over time. Although the expected differences between the control and intervention group over time were not found, as both control and intervention groups demonstrated overall declines in group functioning from posttest to follow-up, there were trends in the expected direction. Specifically, intervention group participants showed less of a decrease in group functioning from posttest to follow-up than the control group. These differences became significant when an organization that differed from the others was statistically removed from the intervention group, with scores for team development and personal effectiveness within one's organization remaining elevated for the intervention group and decreasing for the control group at follow-up. A discussion of these and other findings and a presentation of the limitations to this study provide possible explanations and offer ideas for future research on challenge course programs.

SHORT-TERM EFFECTS OF CHALLENGE COURSE PARTICIPATION

Replicating previous findings on the short-term effectiveness of challenge courses in enhancing group functioning, participants in this study demonstrated

improvement in team development, group effectiveness, and personal effectiveness within the group immediately following challenge course participation. However, contradicting previous findings (Glass & Benshoff, 2002), participants did not show increased cohesion following challenge course participation. Despite a trend of posttest cohesion scores being higher than pretest scores, the differences were not statistically significant.

The lack of improvement in cohesion may be due to a couple of factors. First, the participants were already extremely cohesive to begin with, with a mean score of 4.60 (out of 5) on the PCS at pretest. In comparison, pretest scores for the other measures ranged from 4.17 to 4.31. With belongingness and moral representing the two underlying dimensions of the PCS, participants' high PCS scores at pretest suggest that they already felt a high degree of belongingness and morale prior to the course. Unlike the other measures, which focus on task-orientation and work-related issues such as problem-solving abilities, the PCS addresses members' degree of enjoyment and sense of belongingness to their group. Given that the participating organizations were composed of individuals who were members of their organization out of shared interest in the organization's focus, it follows that participants enjoyed a high degree of cohesion, as defined by the PCS, at the outset of the course. The high cohesion scores at pretest may have contributed to a ceiling effect, with participants unable to significantly improve due to their already high scores.

The lack of increase in cohesion from pretest to posttest may also be due to the challenge course program's emphasis on improving specific task-related interactions among group members, such as problem-solving, as opposed to improving belongingness and morale, the underlying constructs of the PCS. Conversely, the TDI, PGE-O, and PGE-S all focus on specific task-related aspects of organizational functioning. Therefore, these measures may have been more sensitive to the type of improvement stemming from challenge course participation.

While not negating the usefulness of challenge courses in promoting cohesion among work groups, the findings from this study suggest that cohesion may be less affected by challenge course participation than other aspects of group functioning. They also point to challenge courses potentially being less beneficial for already cohesive groups. In fact, with some anecdotal evidence from this study supporting the role of challenge courses in promoting cohesion, it is possible that the challenge course remains a viable means of instilling cohesion in groups, with possibly greater benefits for groups that are less cohesive.

LONG-TERM EFFECTS OF CHALLENGE COURSE PARTICIPATION

For each measure, follow-up scores were significantly lower than posttest scores. The lack of interaction between time and condition suggested that both the intervention and control groups demonstrated this same pattern of results,

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contradicting the prediction that only the control group would show a decline in group functioning at follow-up. Possible explanations for these findings emerge from exploring issues relating to the design of the challenge course, the intervention, and the study itself.

Regarding the challenge course, it is possible that the gains produced by the challenge course were not strong enough to last over time, even with the presence of an intervention aimed at maintaining the gains. In addition to the lack of increase in pretest to posttest scores for the PCS, the pretest to posttest increases for the other measures were relatively small. Without a substantial increase from pretest to posttest scores, it may have been difficult for the intervention to have much of an effect.

The relatively small increases in short-term gains shown in this study are in keeping with evidence for shorter challenge course programs demonstrating smaller effect sizes. As Bunting and Donley (2002) conclude in their meta-analysis of challenge course studies, there is a relationship between the length of a challenge course and the effect size of the pretest to posttest gains. Given that the course used in this study was a half-day course, it follows that greater short-term gains may have evolved had the course lasted a full day or longer. By having a longer course, the larger short-term gains that result may lead to an increased effectiveness of the intervention, thereby leading to an increased maintenance of gains over time. This would support the findings from Priest and Lesperance's

(1994) study, in which participants in a two-day challenge course who later received supplemental procedures aimed at promoting the transfer of challenge course learning demonstrated maintenance of challenge course gains at a six-month follow-up. With this extensive of a challenge course, there was a greater likelihood of larger short-term gains for the participants, rendering Priest and Lesperance's (1994) supplemental procedures more effective and eventuating in participant gains persisting at follow-up.

Another explanation for the lack of maintenance of gains at follow-up for the intervention group in this study is that the intervention may not have been substantial enough to produce significant effects. Unlike the supplemental procedures in Priest and Lesperance's (1994) study, which consisted of refresher activities such as lectures and classroom-based group activities presented on an ongoing basis, the intervention in this study consisted only of sharing and later reinforcing with participants the goals for challenge course participation. Grounded in goal-setting theory, which posits that individuals are more likely to transfer learning from a training environment to their regular work setting if they are made aware of the goals of training (Yamnill & McClean, 2001), the intervention in this study may not have been potent enough to generate the intended effect. Although this investigator attempted to ensure that participants read and heard the goals for their group at both points in the intervention, it is possible that some participants did not pay attention during the intervention, thus

diluting the intervention's efficacy. Alternatively, it is possible that goal-setting alone does not ensure the transfer of learning and training. The maintenance of gains over time may instead emerge from refresher activities, such as those used in Priest and Lesperance's (1994) study. Through these activities, participants may be more able to implement the changes in interpersonal interactions that they learned on the challenge course and thereby maintain the challenge course gains.

An additional aspect of the intervention that may have hampered its effectiveness was its being facilitated by this investigator as opposed to a leader within the organization. Although the goals listed on the pre-course goal sheet and the post-course feedback sheet were developed by the organization's leader and not this investigator, participants may have put less stock in the intervention due to mistakenly thinking that the goals had been generated by someone who was not a member of their organization. Having the organization's leaders distribute and review the goal and feedback sheets may have increased participants' investment in the intervention and thus improved its effectiveness. In fact, other studies that have used supplemental procedures aimed at producing lasting challenge course benefits have employed "in-house" facilitators to lead the interventions and have met with success at follow-up (Priest & Lesperance, 1994).

Finally, another possible explanation for the lack of long-term benefits for the intervention group in this study involves elements of the study's design. First,

the participant group was composed of members of college student organizations who met on a weekly, as opposed to daily, basis. In contrast, participants in other long-term studies of challenge courses and other types of adventure training programs have consisted primarily of corporate groups composed of individuals who work together on a daily basis (Bronson et al., 1992; Priest, 1996; Priest & Lesperance, 1994). Because the student organization members in this study spent a relatively brief amount of time together each week, it is possible that they were less able to practice the skills that they learned on the challenge course. Moreover, their motivation for using the challenge course learning may have been lower than that of corporate group participants in previous studies, as participants in this study may have had other obligations taking precedence over their organization membership, such as classes. Conversely, members of corporate groups work closely together on a daily and ongoing basis and therefore may be more motivated to utilize challenge course learning in order to improve their work environment. Given the important role that motivation to transfer plays in the transfer of training (Holton, 1996), the possibly lower motivation to transfer challenge course learning exhibited by participants this study in comparison to their corporate group counterparts may have reduced their receptivity to the intervention.

The other aspect of the study design that may have played a role in the non-significant differences between the control and intervention groups was the

smaller than desired number of participants. As described in the "Procedure," a power analysis from a previous study of group functioning over time for challenge course participants suggested an n of 75 for the control and intervention groups in this study in order to produce adequate power for obtaining significant findings. Despite having a large number of participants assigned to the intervention group ($n = 100$) and a moderate number assigned to the control group ($n = 37$) at the outset of the study, participant dropout resulted in the analyses being based on much lower numbers ($n = 22$ and $n = 48$ for the control and intervention groups, respectively). Had the number of participants in each of the groups been greater, it is possible that the same effect size would have produced significant differences in group functioning between the control and intervention over time rather than mere trends.

ISSUES OF ATTRITION AND MISSING DATA

Although 70 participants completed the measures at all three test times (follow-up participants) and thus had usable data for the primary analyses, 67 participants were excluded from the analyses due to having missing data at one or more of the test times. This participant group encompassed 36 true "dropouts," or those present at pretest and posttest but not follow-up, as well as 31 participants who were absent or had unusable data for one or more of the other test times. Participant attrition among the dropout group is mostly accounted for by the

logistical issue of some participants not being present at the follow-up administration, which took place during each organization's weekly meeting approximately six weeks after the challenge course. Because these meetings are not mandatory, a fair number of organization members do not attend every meeting. This seemed especially the case for the meetings at which the follow-up administration occurred, as they were toward the end of the semester when many students were busy with end-of-semester assignments. Because participants were not being compensated for their participation with class credit, money, or some other type of incentive, this investigator had little recourse for ensuring participant involvement at follow-up. The relatively high dropout rate at follow-up likely reflects this limitation.

Other participants had missing or unusable data at one or more other test times. This is due to two primary factors. First, participants who skipped 25% or more of the items on each scale were not included in the analysis for that scale. Despite explicit instructions on the survey to answer every question, some participants skipped more than the maximum allowed to receive a score on the measure. Second, some participants did not include their TSU-assigned personal identification (PLID) number on the survey at one or more administrations. This made it impossible for the investigator to match their information across survey administrations and eventuated in their showing incomplete data over time. Although this investigator attempted to limit this occurrence by reminding

participants verbally and in the written survey instructions to include their PLID number on the survey, some participants neglected to do so. Still others may have filled in the wrong PLID number, as some stated when filling out the pretest survey that they were uncertain of the accuracy of their recall of their PLID number. Because the TSU IRB did not want the survey to request that participants provide their social security numbers, this investigator had been restricted to using participants' PLID numbers as a means of identifying them. To minimize the effects of some participants not knowing their PLID numbers, this study would have benefited from having participants include their date of birth or some other quasi-unique way of matching their survey information over time.

A variety of analyses were performed to explore the effects of participant attrition and other factors contributing to missing data. First, participants were grouped according to the survey administration(s) for which they had usable data and then compared along the dimension of treatment condition. Two different analyses showed that follow-up participants, dropout participants, and those with data missing at other time points were not differentially represented in the control and intervention groups. This suggests that neither the challenge course nor the intervention contributed to participants dropping out of or remaining in the study at the various survey administrations.

Participant attrition was also examined by comparing the pretest to posttest response patterns of follow-up and dropout participants. The two groups

showed similar response patterns on each measure, with significant increases

from pretest to posttest on the TDI, the PGE-O, and the PGE-S and no difference

on pretest and posttest scores for the PCS. The similarity in response pattern

between the follow-up and drop-out groups implies that the dropout participants

would have performed similarly to the follow-up group had they been present at

follow-up.

Finally, missing data was also addressed by utilizing a data analysis

technique (Mixed Models) that included data from *all* participants, rather than the

technique (General Linear Model) that had initially been used for the main

analyses in this study, which includes only those with complete data sets in data

analysis. The two data analysis models were shown to yield the same findings on

how control and intervention group participants perform on the group functioning

measures over time. Again, it appears that participant attrition and missing data

did not compromise the overall findings of the study.

In sum, although missing data was a limitation to this study, it did not

seem to influence the general findings. The same results from analyses performed

on only those participants present at all test times would likely have been shown

had participants who were not included in the analyses due to attrition and other

factors leading to missing data been present at all test times. However, there is

one significant difference that may have been shown had there been less missing

data. With less participant dropout, the participant group would have been larger,

eventuating in increased power. This increase in power may have made results that were shown to be trends in this study into significant findings, possibly resulting in the expected differences in response patterns over time between the intervention and control groups.

EXPLORATORY ANALYSES

One of the student organizations in this study differed from the other five organizations in two significant ways. While the PCT, BSA, KKP/TBS, Lambda, and MAV/Net organizations are all social and service organizations, the AFROTC is a military training organization in which members take classes and participate in training exercises with one another. Because AFROTC members spend more time with one another and have more clearly delineated goals and tasks (i.e., those defined by the Air Force for all AFROTC affiliates) than members of other student organizations, there was concern that they may have come into the study with a different level of group functioning than the other organizations. In addition, because the AFROTC participated in a portable challenge course instead of the traditional, University Camp challenge course used by the other organizations in this study, there was a potential that the AFROTC participants' experience in this study differed from those of the other organizations.

To examine the first issue of potential pretest differences between the AFROTC and the other organizations, the pretest scores of the six participating

organizations were compared with one another for each measure. Results indicated that only the AFROTC organization had pretest scores that differed from other student organizations. On the TDI, the PGE-O, and the PGE-S, the AFROTC had significantly higher pretest scores than the other two organizations comprising the intervention group. The AFROTC also demonstrated higher pretest scores than the BSA and MAV/Net organizations on the PGEO and the PGE-S, respectively. All organizations showed similar pretest scores on the PCS.

The higher AFROTC scores at pretest on the TDI, the PGE-O, and the PGE-S demonstrate that AFROTC members had higher baseline levels of team development and personal and group effectiveness than members of other student organizations. This seems likely attributable to the AFROTC members having spent substantially more time together with one another and worked on more task-oriented group activities, such as weekly military training exercises, than members of the other organizations. Given the established link between the degree of organizational effectiveness and the number of opportunities for organization members to work together (Smith, 1989), it follows that AFROTC members exhibited greater team development and perceptions of organizational effectiveness than other organizations due to their having more experiences of working together as an organization.

Because the PCS assesses cohesion according to the degree to which individuals feel a sense of affiliation with and experience enjoyment from their

organization, it is understandable that both AFROTC and non-AFROTC participants demonstrated high PCS scores at pretest. Whereas AFROTC members may experience cohesion from spending time with one another in training activities, non-AFROTC members may develop cohesion as a result of their organizations having a number of social activities in which members spend time together. These activities may generate more enjoyment than the training exercises and classes that typify the context of AFROTC members' interactions, leading to non-AFROTC members developing cohesion due to these interactions rather than from spending time together in the task-related activities more typical of the AFROTC.

Despite similarities in pretest scores on the PCS for AFROTC and non-AFROTC participants, the higher pretest scores for the AFROTC on the other three measures coupled with the AFROTC contributing 41% of intervention group participants may have led to a ceiling effect for the intervention group on these measures. Intervention group participants as a whole may have been less able to show pretest to posttest improvement in group functioning since the AFROTC organization had such high scores on the TDI, the PGE-O, and the PGE-S at pretest. Because the intervention is based on the assumption that challenge course participation leads to increases in group functioning, the lack of pretest to posttest improvement for the intervention group may have played a role in the lack of a maintenance of gains at follow-up for the intervention group.

Thus, a reason for exploring the effects of the intervention with AFROTC

members excluded from the analyses became apparent.

Another motive for removing AFROTC from the participant group for

additional analyses was that the AFROTC participated in a portable challenge

course whereas other organizations participated in a traditional challenge course

at the TSU University Camp. Although portable courses are an accepted form of

challenge course (Neill, 2004) and have been used in empirical studies of

challenge course programs (e.g., Harris & Barbee, 1999; Roland, Summers,

Friedman, Barton, & McCarthy, 1987), no studies comparing the effects of

traditional and portable courses were found by this investigator. Because the

elements in the University Camp and the portable challenge course used in this

study were the same or similar, it was not expected that the effects of the course

would differ for participants on each course. Nonetheless, the possibility remains

that portable courses may have different effects than traditional courses. For

example, the demonstrated benefits to wellbeing of being in a natural setting

(Hartig et al., 1991) may contribute to participants in traditional courses

experiencing greater overall benefits from the course. However, until research

compares the effects of traditional and portable challenge courses, there is little

way to know if portable course participants have different experiences than those

who go on traditional courses. Therefore, at this point, the fact that the AFROTC

completed a portable course rather than a traditional challenge course is simply an additional way in which the AFROTC differed from the other organizations.

Because the AFROTC differed from the other organizations in its higher pretest scores on three of four measures and its use of a portable rather than a traditional challenge course, the AFROTC organization was statistically removed from the participant group and the main analyses were re-run for the TDI, PGE-O, and PGE-S. When AFROTC participants were excluded, the expected interaction between time and condition was significant on the PGE-S and approached significance on the TDI. While both the intervention and control group showed increased scores from pretest to posttest on these measures, only the intervention group showed maintenance of gains at follow-up. In contrast, the control group showed lower scores at follow-up than at posttest.

These results suggest that the initial findings, in which the intervention group showed no maintenance of gains at follow-up, must be reevaluated because they were based on a participant group that included AFROTC members, who differed from other participants in some significant ways. With AFROTC members removed from the analyses, the intervention seemed effective in promoting the maintenance of gains in team development and perceptions of one's personal effectiveness within one's organization at follow-up. By being reminded of their goals for participating in the challenge course, such as improved communication and teamwork, participants appeared to experience an extension

of challenge course gains in these two areas. That the intervention did not demonstrate similar benefits along the dimension of organizational effectiveness, as measured by the PGE-O, was surprising, especially given the significant association between the TDI and PGE-O at pretest. However, the trend of the results for the PGE-O was similar to that of the TDI and PGE-S, with control group participants showing more of a decline from posttest to follow-up than intervention group participants. Overall, the effects of removing the AFROTC from the analyses provide partial support for the role of the intervention in prolonging challenge course benefits.

LIMITATIONS

Despite some evidence for the effectiveness of the intervention, a number of limitations to this study warrant mention. First, a significant amount of participant data was unusable due to participant attrition and missing data. However, the attrition analyses suggest that findings would have appeared similar had all the participants had usable data. The primary consequence of missing data thus appears a lower than desired power as a result of smaller than anticipated control and intervention groups.

A second limitation was the presence of six different organizations comprising the participant group, with three organizations composing each treatment condition. Although no pretest differences among the organizations were found (except for the AFROTC, which was later excluded from the

analyses), it remains a possibility that there were between-organization

differences that may have influenced the findings. While the participating

organizations were collapsed into the treatment groups rather than analyzed

separately because of the small number of participants in most of the

organizations, it is possible that the organizations would have demonstrated

different patterns of results from one another. However, collapsing different

organizations into a larger group is a relatively common practice in the challenge

course literature (e.g., Bronson et al., 1992; Glass & Benshoff, 2002) due to

challenge courses usually requiring that groups be limited to 15 to 20 people.

Typically, challenge course researchers handle this limitation by attempting to

find equivalent organizations for comparison in order to increase the probability

that changes shown by the experimental group are a result of the intervention

rather than environmental factors (Bronson et al., 1992). By only including

student organizations in this study, this investigator attempted to minimize

explanations for the findings that were due to factors other than the treatment

condition.

Another limitation to this study was its use of two measures, the PGE-O

and PGE-S. Rather than being developed with the scientific rigor characteristic of

the other measures in this study, the PGE-O and PGE-S were constructed as an

informal assessment of challenge course participation by the challenge course

coordinator. Although internal reliability analyses indicated some support for the

measures' utility, the findings on these measures should be interpreted with caution until further research indicates their effectiveness at measuring their intended constructs.

Finally, this study may have been limited by the way in which the intervention was carried out. Unfortunately, this investigator often found herself straining to get the attention of intervention group participants when giving them the intervention materials and then attempting to insure that they read the materials. Because time was often an issue, with participants being rushed to start the challenge course or proceed with the agenda of the organization meeting at which the goal/feedback sheets were distributed, the climate for the intervention was often less than ideal. Although as conceived the intervention seemed sufficient for instilling in participants an awareness of their organization's goals, in practice the intervention may have suffered from difficulty insuring participants' focus on and comprehension of the intervention material. However, with the exploratory analyses indicating some support for the intervention's effectiveness, the intervention as carried out may still have resulted in the intended long-term gains.

SUGGESTIONS FOR FUTURE RESEARCH

Future research could improve upon this study in a few ways as well as address additional points of interest. In terms of improving upon this study, future investigations could utilize larger participant groups in order to ascertain the effectiveness of the intervention when power is high enough to detect differences between the treatment groups. Enhancing the participant identification and data matching techniques used in this study could significantly reduce participant attrition, thereby both increasing the size of the participant group and reducing the limitations relating to missing data. Finally, using participants from the same organization would strengthen this study if it were replicated in the future. With some studies of challenge course participation having participants drawn from only one organization (Priest, 1998; Priest & Lesperance, 1994), an increased ability to interpret intervention effects as such rather than as possibly resulting from external factors would emerge if this study were later conducted with participants coming from the same organization.

Other directions for future research involve exploring individual functioning and other aspects of group functioning, utilizing different participants, and developing and evaluating different types of interventions. Evaluating the long-term impact of challenge courses on individual functioning could enhance past research on the individual benefits of challenge course participation (e.g., Davis-Berman & Berman, 1989). One aspect of group functioning that could be

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explored is interpersonal trust. With interpersonal trust considered an important

aspect of team building (Priest, 1998), an intervention aimed at promoting the

maintenance of trust-building following challenge course participation seems like

it could be an important contribution. Evaluating this intervention with additional

participant groups, such as corporate groups or psychotherapy groups, represents

another potentially useful line of research. Finally, developing and assessing

additional interventions aimed at promoting the maintenance of challenge course

gains are essential for improving upon challenge courses and other types of

adventure training programs. It seems especially important to create interventions

or follow-up procedures that are potent enough to produce the desired effects but

convenient enough that organizations would be apt to employ them. Until this

emerges, challenge course programs may continue to be seen as "one shot

wonders" that, while providing an enjoyable diversion for participants, have yet to

prove their mettle as a viable means of substantively improving the dynamics of

participating organizations over time.

IMPLICATIONS FOR PRACTICE

The findings from this study have a few implications for the challenge

course and adventure education fields. First, the lack of pretest to posttest gains

on the cohesion measure coupled with the presence of gains on the other measures

suggest that half-day challenge courses may not be as effective at fostering

cohesion as they are at developing other aspects of group functioning. If an organization leader's sole impetus for his or her group participating in a challenge course is to generate group cohesion, he or she may wish to consider programs other than challenge courses. Alternatively, because participants in this study exhibited high pretest levels of cohesion in comparison to the other types of group functioning, it is possible that challenge courses are as effective at developing cohesion as other aspects of group functioning, but simply are not effective at improving group functioning for areas in which participants already perform well. Therefore, it would be useful to assess the group functioning levels of organization members prior to their participating in a challenge course. For those organizations that already demonstrate a high degree of group functioning, the challenge course may not be useful at improving their already high level of functioning. Leaders of these organizations should consider alternative means of organizational development. Groups that show more moderate levels of group functioning at baseline are more likely to benefit from the challenge course and should proceed with the course as planned.

In keeping with the idea that challenge courses lead to greater short-term benefits for groups with more room for improvement, another implication of this study is that the effectiveness of a post-course intervention will be influenced by the degree of improvement shown by groups following challenge course participation. For groups that demonstrate some, but not substantial, gains

following challenge course participation, the intervention may not serve its purpose of fostering maintenance of challenge course gains. Conversely, for groups evidencing large gains in group functioning following challenge course participation, the intervention may be an effective way of maintaining these gains over time. Therefore, this intervention should be considered as an adjunct to the challenge course for those organizations that a) have low to moderate baseline levels of group functioning and b) are interested in generating long-term gains in group functioning.

A final implication of this study is that it would behoove challenge course programs to invest resources in developing post-course interventions or booster sessions that facilitate the transfer and implementation of challenge course learning into participants' regular environments. In particular, it would be useful to create an intervention that promises the same benefits of procedures with demonstrated effectiveness at prolonging challenge course gains without their time- and labor-intensive nature (e.g., Priest & Lesperance, 1994). While the intervention examined in this study may have improved upon Priest and Lesperance's (1994) intervention in its relative brevity, the mixed support for its effectiveness points to the continued need for developing a post-course intervention that is effective yet brief. With challenge course programs becoming increasingly popular (e.g., Glass & Benshoff, 2002), it is imperative that challenge course educators develop and evaluate interventions aimed at

promoting long-term gains. Although the interventions developed for this and other studies certainly show promise, additional work could utilize the best elements of preexisting interventions in creating a brief but effective procedure that produces lasting gains following challenge course participation.

APPENDIX A

Goals of Challenge Course Participation

SAMPLE

1) Team building
   a. Reduce presence of cliques
   b. Include everyone (vs. leaving people out)
   c. Develop better understanding of what makes a good team
   d. Create sense of unity

2) Increase problem solving
   a. Recognize and use resources wisely
   b. Narrow options and prioritize
   c. Recognize the importance of planning
   d. Be *proactive* instead of *reactive*

3) Improve communication
   a. Speak up more when you need help
   b. Improve the receiving end of communication
   c. Follow *through* with action and follow *up* with dialogue

APPENDIX B

Consent Form

You are invited to participate in a study of the impact of challenge course participation on group behaviors and dynamics. My name is Katie Hatch and I am a graduate student at the University of Texas at Austin. This study is one of a number of studies being done on college student emotional health by Christopher McCarthy, Ph.D. You are being asked to participate in this study because you are a member of a SWT student organization that is participating in the GOAL program. If you participate, you will be one of approximately 150 people in the study.

If you decide to participate, I will be asking you to complete a one-page survey three times: twice on the day of the challenge course and once approximately two months after the course. The survey asks about your feelings about your organization and your perceptions of dynamics within your organization. It should take approximately 10 minutes to complete. At the two-month follow-up date, a survey that asks about the impact of the challenge course on your organization will also be given to you. This survey should take approximately 5 minutes to complete. The surveys will be distributed to you and collected by myself, a research assistant, or a GOAL program staff member.

It is not expected that participating in this study will put you at risk regarding your personal wellbeing or your wellbeing within your organization. Rather, it is anticipated that participating in this study will assist you in understanding more about your organization's dynamics and may open new lines of communication for your organization. Additionally, your participation will benefit the SWT GOAL program as it seeks to understand the group processes occurring within organizations utilizing their challenge courses, thus allowing the program to further develop and improve its services. On a broader scale, your participation will benefit others in the expanding field of experiential education who are trying to determine and measure the impact of ropes courses on group dynamics.

Any information that is obtained in connection with this study and that can be identified with you will remain confidential (between Tina Carter and myself) and will be disclosed only with your permission. The only identifying information requested on the questionnaires is your PLID number or the last 4 digits of your social security number, which is necessary for organizing data collection. Your survey responses will not be linked to your name in any written or verbal report of this project. While you and other members of your organization will have access to the collective results of organization members' responses on the questionnaires, there will be no way for members to link your specific responses with you.

Your decision to participate or not will not affect your present or future relationship with The University of Texas at Austin or Southwest Texas State University. If you have any questions about the study, please ask me. If you have any questions later, you may call me at (512) 474-9080 or Christopher McCarthy, Ph.D., at (512) 471-4409. If you have any questions or concerns about your treatment as a research participant in this study, please call Clarke Burnham, Chair of the University of Texas at Austin

Institutional Review Board for the Protection of Human Research Participants at (512) 232-4383. An extra copy of this consent form is included for you to keep.

You are making a decision whether or not to participate. Your signature below indicates that you have read the information provided above and have decided to participate in the study. If you later decide that you do not want to participate in this study, simply tell me. You may discontinue your participation in this study at any time.

_____

Printed Name of Participant

_____ _____

Signature of Participant   Date

_____ _____

Signature of Investigator   Date

APPENDIX C

Feedback Sheet

SAMPLE

Congratulations on completing the challenge course! We hope that you recognize the gains that [*name of group/organization*] made in teamwork and problem solving from participating in the challenge course. We also hope that you continue using the skills that you learned on the course as you continue your work together. In particular, we encourage you to use the same skills that brought your group success on the challenge course as you try to meet the goals of your group. To refresh your memory, these goals are listed below. Good luck!

1) Team building
    a. Reduce presence of cliques
    b. Include everyone (vs. leaving people out)
    c. Develop better understanding of what makes a good team
    d. Create sense of unity

2) Increase problem solving
    a. Recognize and use resources wisely
    b. Narrow options and prioritize
    c. Recognize the importance of planning
    d. Be *proactive* instead of *reactive*

3) Improve communication
    a. Speak up more when you need help
    b. Improve the receiving end of communication
    c. Follow *through* with action and follow *up* with dialogue

APPENDIX D

Survey on Challenge Course Participation

1.   How has participation in the challenge course affected the way that your
        group works together?

2. *   Did having someone meet with your group to give you feedback on your
        group's participation in the challenge course make it easier for you to
        recall some of the skills you learned on the challenge course? Please
        explain why or why not.

3. *   Did having someone meet with your group to give you feedback on your
        group's participation in the challenge course help you make use of
        challenge course skills in your interactions with members of your
        organization over the last two months? Please explain why or why not.

  * *These questions were only administered to those in the intervention condition.*

APPENDIX E

Perceived Cohesion Scale

INSTRUCTIONS: Please <u>FILL IN</u> a number from 1 to 5 that best indicates your level of agreement with each of statements 1 through 6:

Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Slightly Agree	Strongly Agree
1	2	3	4	5

1. I feel that I belong to this organization._____

2. I am happy to be part of this organization._____

3. I see myself as part of this organization._____

4. This organization is one of the best anywhere._____

5. I feel that I am a member of this organization._____

6. I am content to be part of this organization._____

APPENDIX F

Team Development Indicator

INSTRUCTIONS: *Please <u>FILL IN</u> a number from 1 to 5 that best indicates your level of agreement with each of statements 1 through 10:*

Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Slightly Agree	Strongly Agree
1	2	3	4	5

1. Team members understand group goals and are committed to them. _____

2. Team members are friendly and interested in each other. _____

3. Team members acknowledge and confront conflict openly. _____

4. Team members listen to others with sensitivity and understanding. _____

5. Team members are prompt in making decisions and initiating solutions._____

6. Team members recognize and respect individual differences. _____

7. Team members have high standards for their own work and the team's performance. _____

8. Team members look to each other for consultation on resolving challenges. _____

9. Team members recognize and reward team achievements. _____

10. Team members encourage and appreciate comments about team efforts. _____

APPENDIX G

Personal and Group Effectiveness Scale

INSTRUCTIONS: Please consider your organization's effectiveness and also your personal effectiveness on each of the items in the four categories. A score of 5 indicates high effectiveness (group/self is effective the majority of the time); 3 indicates moderate effectiveness (group/self is effective some of the time); 1 indicates ineffectiveness (group/self is never effective). Please CIRCLE the appropriate response for each item.

Effectiveness Level	Group	Self
1. Giving positive feedback	1 2 3 4 5	1 2 3 4 5
2. Receiving positive feedback	1 2 3 4 5	1 2 3 4 5
3. Problem solving	1 2 3 4 5	1 2 3 4 5
4. Decision making	1 2 3 4 5	1 2 3 4 5
5. Conflict resolution	1 2 3 4 5	1 2 3 4 5
6. Tolerance of individual differences	1 2 3 4 5	1 2 3 4 5
7. Cooperation on tasks	1 2 3 4 5	1 2 3 4 5
8. Development of support networks	1 2 3 4 5	1 2 3 4 5
9. Ability to overcome stress & frustration	1 2 3 4 5	1 2 3 4 5
10. Respect for others	1 2 3 4 5	1 2 3 4 5
11. Clear goals & objectives	1 2 3 4 5	1 2 3 4 5
12. Willingness to take risks	1 2 3 4 5	1 2 3 4 5
13. Sense of purpose	1 2 3 4 5	1 2 3 4 5
14. Sense of direction/focus	1 2 3 4 5	1 2 3 4 5
15. Take advantage of opportunities	1 2 3 4 5	1 2 3 4 5
16. Commitment/dedication	1 2 3 4 5	1 2 3 4 5
17. Confidence	1 2 3 4 5	1 2 3 4 5
18. Energy/enthusiasm	1 2 3 4 5	1 2 3 4 5
19. Competence	1 2 3 4 5	1 2 3 4 5
20. Feeling of significance	1 2 3 4 5	1 2 3 4 5

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