

**Immediate and Short-term Effects of Challenge Course Training on Perceived Employee Cohesion within Human Services Workers in Ten Rural Counties**

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**Abstract**

This study finds a significant increase in perceived cohesion for 137 participants immediately after a three hour Challenge Course training for human service employees in ten rural counties. Two weeks following the Challenge Course training there was still no significant drop in perceived cohesion for seven employees. This, however, changes for the individuals responding three or more weeks post intervention (n = 44) with a significant drop in perceived cohesion. Support of using initiatives as opposed to physical challenges is suggested by the drop off of participation level when physical challenges are introduced during the training.

**Introduction**

Employees working in human services in every state must work under highly stressful situations and must utilize multiple resources to assist consumers needing their services. This requires a high degree of cooperation and coordination within agency programs. Reorganizations, reduced funds leading to limited resources, increased caseloads and employee turnover are issues that create on the job stress and conflict. Within this study, we hypothesize that perceived cohesion among employees may reduce the feelings of stress and isolation, in turn, providing more stability on the job and better services to families.

Group cohesiveness is a “dynamic process which is reflected in the tendency for a group to stick together and remain united in the pursuit of its goals and objectives” (Carron, 1982, p. 124). Work group cohesion has been defined as “the degree to which an individual believes that the members of his her work group are attracted to each other, willing to work together, and committed to the completion of the tasks and goals of the work group” (Bass; Stogdill as cited in Riordan & Weatherly, 1999, p. 312).

To fully understand the importance of employee cohesion for this study one only has to review the demographic and employment situation of Appalachia. The area of study consists of a 10-county region that is located on the western edge of Appalachia in the foothills of the mountains. At the time of the study, the region was considered primarily rural; only 17 percent of the population is urban, according to the U.S. Census Bureau (2002). Five of the counties are considered completely rural, meaning there are not any communities with a population of at least 2,500 people within the counties.

The agrarian-based history and the rural nature of the communities may be reasons contributing to the low per-capita income of \$13,453 which is 36 percent below the national average. The unemployment rate in the study region is surprisingly consistent with the U.S. average, which both recorded at 4.2 percent during the 2000 census. It needs to be noted that approximately 28

percent of the people in the study region live below the poverty line, compared to the national average of 12.4 percent. Self-employment and farm incomes have been standard components of the economic dynamics in the study region, but external employment is becoming increasingly important. A full 30 percent of the workers are employees of private businesses with another nine percent of workers employed by the public sector, which includes state, federal or local government agencies. The higher employment rate is an important factor in keeping the communities economically viable even though per-capita incomes are low. Employee cohesion is one means of maintaining the relatively high level of employment and low employee turnover.

This study was conducted at the request and with the support of the senior regional administrator for family services that encompassed services for child protection (including foster care and foster-adoption), adult protection, and low-income financial support. The service area included ten rural counties within an Appalachian region. Employee cohesion was a broad concern resulting from a major reorganization of family support and protection workers within the ten counties that resulted in employees moving into new working environments that integrated these separate specialties. While this arrangement was projected to increase coordination of services, workers in each county found themselves among strangers with very different responsibilities and knowledge. The rationale of this intervention was twofold: to determine if low-elements challenge course training has an effect on increasing perceived employee cohesion and if the effect will remain significant four weeks after training.

## **Review of Related Literature**

Challenge course intervention with employees has been well documented for increasing group cohesion (individuals brought together for the short-term experience), however, there is little data measuring the effect on perceived employee cohesion (individuals that are formed before and that continue together after the experience). Long (1987) discusses the use of a Ropes Courses by multi-national corporations such as AT&T and IBM for team building, problem solving and personnel management. These companies have made challenge courses a part of their overall management program. In a similar empirical study, Wilde (1997) reported that an exercise called the "Leap of Faith" was incorporated into a day long Ropes Course for business executives and mid-level managers. The result was increased trust and a greater sense of teamwork among the participants.

While perceived employee cohesion has not been examined, studies on challenge course intervention among a variety of treatment groups have demonstrated positive outcomes. Traft & Kablach (1987) outlined a list of positive psychological outcomes for participants in a ropes course that included: problem solving, goal setting, discipline, team work, increased trust, improved decision making, self-confidence, and self-esteem. Other benefits included the ability to communicate thoughts and feelings to others. Smith (1991) demonstrated similar results utilizing a Ropes Course and its effect on psychiatric inpatients. In addition, Faulkner (2002) demonstrated that a low-elements challenge course could be effective in increasing communication and problem solving skills in a case study of substance abusers.

Family groups have also reported increased cohesion after challenge course intervention. Increasing the cohesion among family groups has been linked to a number of positive outcomes including: overall functioning of adolescents, reduction in suicidal behavior, and feelings of bonding and closeness (Faulkner, 2001; Golins, 1978; Hibner, 1987; Rubinstein, Halton, Kasten, Rubin & Stechler, 1998).

## **Methodology**

### ***Design***

This project used a quasi-experimental pre-test/posttest and posttest/follow-up design to test the effect of the challenge course experience on perceived cohesion. Eight Challenge Course

sessions were conducted within June and July 2002 with ten counties participating in the study. Each session took approximately 3 hours and was led by two of the authors of this study. The Employee Cohesion Scale was given to employees before and after completion of the challenge course experience. In addition, an e-mail request was sent to all employees to again complete the scale approximately 4 weeks later. By clicking on a link in the body of the request, they were able to complete the scale on-line and "send" it back to the researchers at the click of a button.

### ***Pre and Post Sample***

Employees in each of the ten counties participated as individual groups (n = 137), with two sessions joining two counties each due to the small employee count. For the joined sessions, employees were paired together with their own coworkers as often as possible and were asked to complete the scale with their coworkers in mind (as opposed to the group as a whole). The employees were recruited by their county supervisors to voluntarily participate and receive four hours of training credit (12 hours required annually). The trainings were held in local libraries.

Only participants that completed both the pre and post survey were included in the sample. The range of participants by county was from 6 to 24. Of the 137 participants, 8.0% were Child Support Workers, 48.9% were Family Support Workers, and 43.1% worked in Child and Family Protection. The sample was predominately female (79.4%) and white (94.2%) with 5.8% reporting black. Over a quarter of the respondents reported having an undergraduate degree (28.5%) with nearly a third having some college (22.6%) or an Associates degree (9.5%). The remaining participants were equally distributed between some high school/high school graduate (19.7%) and some graduate school/graduate degree (19.7%). One hundred twenty eight of the 137 participants responded the variable age. Respondents age ranged between 20 and 70 years with a mean age of 39.25 (n=128).

When looking at employment variables, there was evidence of longevity as well as relatively recent hires within region with the highest percentages reporting 10-15 years (25.5%) and 2-4 years (25.5%) with this agency. New hires (1 year or less) and those employed 20 years or more were reported at 11.7% each. While 22.6% had worked in their current job site one year or less, 40.9% more had worked in current their job site only 2-4 years.

### ***Follow-up Sample***

Only participants that completed the pre, post, and follow-up survey were included in the follow-up sample. Nine of the ten original counties participated in the follow-up survey. The range of responses by county was from 1 to 12 with a total of 44 responses.

This sample was fairly compatible to the demographics of the pre-post sample. Of the 44 respondents, none were Child Support Workers, 47.7% were Family Support Workers, and 52.3% worked in Child and Family Protection. The sample was predominately female (77.3%) and white (95.5%) with 4.5% reporting black. Over half of the respondents (54.6%) reported having at least an Associates degree and respondents age ranged between 20 and 53 years with a mean age of 38.38 (n=39).

When examining employment variables, the highest percentages reported 10-15 years (25.5%) and 2-4 years (29.5%) with this agency. While 20.5% had worked in their current job site one year or less, 43.2% more had worked in current their job site only 2-4 years.

### **Perceived Cohesion**

The construct of cohesion is used repeatedly in various research connected to group dynamics. For this study, "perceived cohesion encompasses an individual's appraisal of their relationship to the group" (Chin and Salisbury, 1999, p. 753). While the concept of employee satisfaction exists in several different scales, no one has developed a measure for "employee cohesion." Thus, the

authors found it necessary to create their own scale. The Employee Cohesion Scale is an 8-item likert type scale that asks for employee's perception of five group related tasks (finding solutions, making suggestions, sharing opinions, receptiveness to feedback, and one's sense of inclusion in the group). In addition, three emotional responses are included: feeling of satisfaction, closeness, and liking the people they work with. The items on the scale are measured from 5 = very much, 3 = neutral, 1 = not at all. Scoring of the scale consists of summing the 8 items and dividing by 8. The scale measures two aspects of perceived cohesion: shared tasks (intra) and personal emotions (inter). When a factor analysis was conducted using Principal Component Analysis the results showed one factor for measuring perceived cohesion. The results also showed that 67.7% of variance was explained by cohesion. (see Table 1 below).

Table 1. *Factor Analysis for Perceived Cohesion*

Items	Communalities
On the whole I am satisfied with the people I work.	.622
My coworkers and I work together to find solutions to problems.	.679
I feel a sense of closeness with my coworkers.	.704
When I make suggestions, my coworkers listen to me.	.670
In general, I like the people I work with.	.635
In general, I feel free to share my opinions and ideas with my coworkers.	.633
My coworkers are receptive to feedback and criticism.	.708
My coworkers attempt to include me at work.	.742

Table 2 below is a graphic description of the internal reliability (Cronbach's Alpha) completed on the Employee Cohesion Scale. The overall consistency of the scale is .9418 (standardized item alpha = .9434). Individual analysis of each item shows that no item should be deleted from the scale.

Table 2. *Reliability Analysis – Scale (Alpha)*

Item	Mean	Std Dev	Item If Alpha Deleted
Item 1.	4.5328	.5947	.9388
Item 2.	4.5474	.5937	.9349
Item 3.	4.4307	.7050	.9368
Item 4.	4.3577	.6832	.9335
Item 5.	4.5474	.6060	.9367
Item 6.	4.4307	.6619	.9322
Item 7.	4.2701	.7426	.9326
Item 8.	4.3577	.7834	.9314

n = 137    Alpha = .9418    Standardized item alpha = .9434  
 F-score    Significance  
 9.6255    .0000

## **Challenge Course**

A Challenge Course is defined as a series of non-competitive activities designed to allow participants to build employee cohesiveness utilizing group problem solving games and activities where individuals must help each other to complete the challenge. The challenges chosen for this study are borrowed from various sources, known and unknown, within the experiential learning community that contributes to the spirit of sharing and cooperation. It is the sequencing of the challenges, from initiatives to more physical challenges, that was of considerable importance.

### **Initiatives**

Initiatives are challenges used as precursors to more physically demanding activities. The amount of skills needed for these challenges are listed and increase as the group progresses. All activities require the following skills: problem-solving skills, cooperation and communication. The following are descriptions for the nine initiatives facilitated during the each session:

Helium Hula Hoop: Members stand in a circle & place a hula-hoop on their fingers that is lowered to the ground.

Hula Hoop Pass: A hula-hoop is passed around the group with everyone holding hands and not letting go.

Group Juggle: The group stands in a circle to pass a ball to other members until order is established. Eventually more balls are introduced into the pattern.

Warp Speed: Move a ball through the same order of people in the fastest amount of time.

Tug of Peace: 2 groups sit on each side of a rope facing each other & sitting down. While pulling together, groups will be able to stand at the same time.

Human Knot: Untangle a knot formed of crossed hands.

Tank: One person is blindfolded (the tank) and their partner gives commands to direct where the blindfolded person should go to locate ammunition.

People to People: Form a circle standing next to a partner. One person is "It" and stands in the middle of the circle giving directions to the partner's (i.e. knee to elbow).

Willow in the Wind: Members stand shoulder to shoulder with hands "spooned" to catch the person in the middle and gently move her/him around the circle.

### **Physical Challenges**

Physical challenges are designed to provide more intense opportunities for cooperation, communication and problem-solving skills. Using ropes, beams, boards, or platforms as part of the challenge, these activities also involve various degrees of physical skills. The following are descriptions for the three physical challenges facilitated during each session:

All Aboard: Teams try to get all members onto a small platform with no feet touching the ground.

Traffic Jam: Two groups are lined up facing each other on opposite ends of several feet of boards laid out in a straight line and switch places without stepping off the boards.

Alligator Crossing: The group from point "A" to point "B" using boards placed on platforms.

## Results

### *Participation Level*

Because the activities were “Challenge by Choice,” participation in the challenges was documented on each participant. Participation in each challenge was entered as 1=yes (participated) and 0=no (did not participate). In Table 3, it is clear that the participation dropped when physical challenges were introduced to the group.

Table 3. *Participation Level by Challenge*

Challenge	Posttest (n = 137)		Follow up (n = 44)	
	<i>f</i>	%	<i>f</i>	%
<b>Initiatives</b>				
Helium Hula Hoop	133	97.1	44	100
Hula Hoop Pass	136	99.3	44	100
Group Struggle	37	100	44	100
Warp Speed	137	100	44	100
Tug of Peace	124	90.5	40	90.9
Human Knot	132	96.4	44	100
Tank	135	98.5	44	100
People to People	137	100	44	100
Willow in the Wind	125	91.2	42	95.5
<b>Physical Challenges</b>				
All Aboard	86	62.8	26	54.5
Traffic Jam	89	65.0	24	54.5
Alligator Crossing	85	62.5	24	54.5

### *Pre/Post Survey Results*

Results from the pre/post survey (see Table 4) showed that the mean difference between pretest scores ( $m=4.2099$ ) and posttest scores ( $m=4.4343$ ) for the 137 participants supports a significant increase in perceived cohesion immediately after the challenge course sessions ( $t = -6.458$ ,  $p < .001$ ).

Table 4. Paired Samples T-test; Pretest and Posttest

(n = 137)

Mean Difference	Sd	T-value	df	Sig. (2 tailed)
.2245	.40678	6.458	136	.000

### Post /Follow-up Survey Results

Paired Sample T-test was used for comparing the sample of 44 follow-up responses (m=4.2587) to their post survey responses (m=4.4343) by days/weeks (see Table 5). These findings support that there was no significant difference between posttest and those responding within two weeks following the challenge course training. This, however, changes for the individuals responding three or more weeks post intervention.

Table 5. Follow up Mean Differences by Weeks Post Training

(n = 44)

Days/Weeks (Between post and follow up)	n	Mean Difference (Between post and follow up)	T value
8-14 days/2 weeks	7	.1964	1.868
15-21 days/3 weeks	23	.2772	3.025**
22-28 days/4 weeks	33	.3220	3.615**
29-35 days/5 weeks	35	.3357	3.959***
36-42 days/6 weeks	40	.3094	3.889***
43-47 days	44	.3181	4.254***

\*p≤.05

\*\*p≤.01

\*\*\*p≤.001

### Multivariate Analysis

Using linear regression, there were no independent variables that were significant predictors to account for the difference in scores between pre and posttest or the difference in scores between posttest and follow-up (see table 6). This lends support that the intervention, alone, is responsible for the change in scores. The multiple regression is an amalgamation of demographic variables that were not necessarily driven by a theory or model but more of an ad hoc procedure.

Table 6.

*Regression Analysis Predicting Differences between Posttest and Follow up*

Dependent Variable		Differences in pretest and posttest scores N = 137		Differences in posttest and follow up scores N = 44	
Variable Name	Beta Coefficient	T-Score	Beta Coefficient	T-score	
Gender	.101	.839	-.055	-.149	
Age	-.050	-.324	.331	.640	
Job Title	.229	1.922	.012	.047	
County of Job Site	.008	.062	.469	1.368	
Program Area Employment	.001	.006	-.167	-.485	
Total Time Employed At Agency	.096	.588	.335	.885	
Total Time at Current Job	-.174	-1.182	-.195	-.541	
Ethnicity	.008	.065	.107	.389	
Highest Education	-.009	-.071	.408	1.212	
Days Between Intervention And Follow up			-.461	-1.066	
Time of Training	-.162	-1.314			
R-Squared		.089		.284	
F-Score		.739		.556	

**Discussion**

The low-elements portion (initiatives) of the Ropes Course (Challenge Course) has been consistently demonstrated to be a key factor in increasing trust, cohesion, and bonding, and individual self esteem within a group (Boyle, 1982; Daniels, 1994; and Meyer and Wenger, 1998). This study supports the findings that Challenge Course training immediately increases perceived cohesion for employees although we know the effects diminish over time as indicated by the post test results. Where this study expands knowledge is in the type of participation required to receive an effect and attempts to look at the longevity of the effect of challenge course training on perceived cohesion. In addition, rural counties with limited resources, both financial and human,

can benefit from training employees to be facilitators of Challenge Course trainings to increase employee cohesion that may result in positive work-related outcomes (retention, job satisfaction, and increased productivity).

### **Participation Level**

Support of using initiative as opposed to physical challenges is suggested by the drop off of participation level when physical challenges are introduced. In fact, research suggests that high element Ropes Courses tend to reap individual benefits, such as self-esteem as opposed to group benefits such as cohesion (Aubrey and MacLeod, 1995; Hart and Silka, 1995; Lieberman and DeVos, 1982; Mann, 1994; Stopha, 1994; and Van den Brink, 1983). This study utilized initiatives as a progressive challenge with limited physical challenges (introduced later in the three-hour training). There was a significant drop in participation when the physical challenges were introduced.

### **Follow-up Results**

There are many challenges to interpreting the follow up results. This study found cohesion remained significant after two weeks post intervention, however, the number of responses in this sample was only seven. One immediate overall observation is that once the follow-up means show a significant decrease from the posttest means, it continues to remain significantly different regardless of the sample size in this study ( $n = 44$ ). This is the area of research that is most needed for examining the long-term benefit of challenge course training for employees.

Without a comparison group in this study it is difficult to ascertain exactly why the effect was not maintained past two weeks. It is possible that the drop in cohesion can be attributed to multiple factors- all of them extraneous to the study. Future research needs to include work related variables on follow-up including: change in workload, employee turnover, and administrative changes.

### **Limitations**

There are methodological issues that limit this study; the most obvious is the limited sample size, specifically for the follow-up group (only 44 respondents). Another limitation is the lack of a comparison group to help control for some of the threats to validity. While results could be artifacts and not true effect directly attributable to the Challenge Course, Rubin and Babbie (2004) state that since there is not one perfect method for avoiding measurement error, we can use several imperfect measures to see if they produce the same findings. Therefore, including more variables (such as self-esteem and work-related variables and a control group), will increase the rigor of this study. In addition, the results of this study cannot be generalized outside of the sample due to unique characteristics of the geographical area (Appalachia).

### **Future Research**

There are many factors to examine in future research: length of training, length of the effect, the type of challenge, the various benefits of Challenge Course training for employers (reduced sick time, increased productivity), as well as the benefits for employees (increased cohesion and self-esteem).

In one of the few studies to look at long-term effects, researchers found that the increase in self-esteem was still significant six months post intervention but no trust or teamwork (Davis, Ray, and Sayles, 1995). Therefore, future research should include variables that measure self-esteem.

There is potential for continuing the research of Challenge Course Training on employees that also measure outcomes. Many agencies want quantitative data to demonstrate a solid empirical process for increasing teamwork, communication levels, and overall functioning of the agency. To

accomplish this, one company surveyed each of the employees of the agency on job satisfaction and other pertinent areas (Daniels, 1994). After employees and managers completed the one day Ropes Course they were given the same survey again. The results they reported are positive (increased work place satisfaction, lowered use of sick time, and increased productivity). With further research, especially surrounding the associations and length of the effect following Challenge Course training, agencies can determine when re-training would be beneficial.

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