

## Effects of Team Building on Exercise Adherence and Group Task Satisfaction in a Youth Activity Setting

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Results from previous research have revealed a positive relationship between team building (TB) and several measures of adherence in adult exercise settings (Carron & Spink, 1993; Spink & Carron, 1993). However, research has yet to examine the efficacy of using a TB intervention to impact the exercise adherence of youth. The main purpose of this study was to examine the effect of a TB intervention on specific adherence behaviors of youth in an exercise club setting. A second purpose was to investigate the effects of TB on participant's satisfaction with the group's functioning (group task satisfaction). Participants were 122 youth (13–17 years) participating in 10 rural, school-based exercise clubs. Clubs were randomized into five TB ( $n=65$ ) and five control groups ( $n=57$ ). Results revealed that following the introduction of the intervention, the two groups differed significantly on the adherence measure of session attendance but not on dropout behavior. Further, significant differences were found between the groups in group task satisfaction. The study findings extend previous TB research to a youth population and support TB as an effective group-based intervention to improve session attendance and group task satisfaction in an exercise setting in this population.

*Keywords:* team building, exercise adherence, youth, intervention, group task satisfaction

Adhering to a regular program of physical activity has been associated with a number of physical and psychological health benefits for youth (Anderson et al., 2006; Kirkcaldy, Shepard, & Siefen, 2002). Despite these benefits, poor physical activity adherence among youth is a prominent public health concern. In Canada, for example, a nationwide examination of physical activity revealed a significant decline in physical fitness among Canadian youth (6–19 years) over the past three decades (Trem-

blay et al., 2009). Given findings such as these, addressing the issue of youth inactivity warrants careful consideration.

A number of approaches have been used to identify factors associated with adherence in exercise programs. One that has been receiving increasing attention is the use of groups (Brawley, Rejeski, & Lutes, 2000; Spink & Carron, 1993). This focus on groups may not be surprising given that individuals prefer to be active with others (Beauchamp, Carron, McCutcheon, & Harper, 2007; Wilson & Spink, 2009). Further, it has been reported that attendance is better in group versus individually based programs (Massie & Shephard, 1971).

Although group-based exercise interventions have received little attention in the youth setting, there is a considerable body of evidence to support the efficacy of group-based interventions addressing other important health behaviors in youth (e.g., drug use, alcohol consumption, aggression, unprotected sex; Conduct Problems Prevention Research Group, 2004; Miller-Johnson & Costanzo, 2004). This evidence and the observed, positive exercise ad-

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herence benefits associated with group-based interventions with adults (cf. Burke, Carron, Eys, Ntoumanis & Estabrooks, 2006; Dishman & Buckworth, 1996) highlight the potential efficacy of group-based interventions to improve physical activity adherence among youth.

Among group-based approaches, one that has received increasing attention is the psychological intervention of team building (TB). Although its origins are in the organizational development literature (cf. Klein et al. [2009] for a review), TB has been reported to be effective in improving specific measures of adherence in adult exercise settings (Burke et al., 2006). In these settings, adherence is typically defined as maintaining involvement in a self-selected program (Brawley, 1990; Carron, Hausenblas & Mack, 1996; Meichenbaum & Turk, 1987). In terms of adherence to activity, it has been reported that adult and older adult participants exposed to a TB intervention attended more sessions (Estabrooks & Carron, 1999; Watson, Martin Ginis, & Spink, 2004), were late less often (Spink & Carron, 1993), and dropped out less (Spink & Carron, 1993) than participants in standard exercise groups. Despite the efficacy of TB in enhancing exercise adherence in adult populations, to our knowledge, TB has not been examined in a youth exercise setting.

For the most part, TB in the exercise setting has drawn on the definition of Newman (1984), who defined TB as an intervention designed to “promote a greater sense of unity and cohesiveness, and to enable the team to function together more smoothly and effectively” (p. 27). The key mechanism identified within this definition—group cohesion—has featured prominently in the TB and adherence research focusing on adults. Previous TB-cohesion research in adult exercise settings has found a positive relationship between TB, cohesion, and exercise adherence (Carron & Spink, 1993; Spink & Carron, 1993).

While the relationship between TB and adherence in an exercise setting has yet to be examined in youth, a relationship has been reported between TB and its key mechanism—cohesion—in the youth sport setting (Newin, Bloom, & Loughead, 2008; Senecal, Loughead, & Bloom, 2008). For example, Senecal and colleagues (2008) reported a positive relationship between a TB goal-setting program and perceptions of cohesion in a sample of high

school basketball teams. A related finding was found with youth ice hockey teams, where it was reported by coaches that participants exposed to a TB intervention demonstrated increased team bonding over the course of a season (Newin et al., 2008).

In the exercise setting, the use of a tailored four-stage TB process (introduction, conceptual, practical, intervention) that targets cohesion has been reported frequently (Carron & Spink, 1993, 1995; Spink & Carron, 1993; Watson et al., 2004). The model is built on a conceptual framework developed by Carron and Spink (1993) that focuses on cohesion. In this framework, cohesion within a group is viewed as a product of conditions that flow from three different categories of group characteristics, including group environment, group structure, and group processes. Within each of these three categories, specific factors that have been shown to be associated with cohesion are identified (e.g., group environment, creating a sense of distinctiveness). As part of the TB intervention, it is these specific factors (e.g., creating distinctiveness) that are manipulated by the leader to impact group cohesion.

While implementation of this TB intervention has been found to be associated with cohesion in the exercise setting (e.g., Carron & Spink, 1993, 1995; Spink & Carron, 1993), one recent study examined the relationship between the actual factors manipulated in the intervention (e.g., distinctiveness) and cohesion (Bruner & Spink, 2010). In that study, students from 10 different rural high schools were randomly assigned by school to either a TB exercise club or a control exercise club run by one of the teachers in each of the schools. Participants in both conditions received a standardized exercise program over the course of the intervention. In the TB condition, teachers attended a TB workshop where they were trained to use the factors within the framework (e.g., distinctiveness) as frames of reference to develop practical strategies for techniques they could use in their exercise club to build cohesion (e.g., introduce a club name). These strategies were then delivered to the participants when the teachers returned to their exercise clubs.

The results from that study revealed that the strategies implemented by the teachers contributed to the prediction of task cohesion within the clubs offering support for the factors within

the Carron and Spink (1993) TB model identified as impacting cohesion. In addition, an assessment of the factors that affect how the intervention was implemented/conducted (i.e., a process evaluation; see Baranowski & Stables, [2000]) was also conducted. This process evaluation revealed that the TB components within the Carron and Spink (1993) model were implemented as outlined, and the intervention appeared to be appropriate for a youth exercise setting (Bruner & Spink, 2010).

Results reported in the current study are part of the intervention described elsewhere by Bruner and Spink (2010). While the previous study described the successful implementation and evaluation of the TB intervention used in this study, the focus of the present study was on two key outcomes that flowed from that TB intervention (i.e., adherence and satisfaction).

The main purpose of the present study was to examine whether a TB intervention that had established a positive relationship with cohesion (Bruner & Spink, 2010) would increase the adherence behaviors of youth exercise participants. Drawing on the extant literature, it was predicted that youth participants exposed to the TB intervention would exhibit better levels of adherence (i.e., better in-session attendance, less lateness, less dropout behavior) than participants not exposed to such an intervention. This hypothesis was based on previous studies with an adult sample that have found a relationship between exposure to TB, cohesion, and increased adherence (Estabrooks & Carron, 1999; Spink & Carron, 1993; Watson et al., 2004).

In addition to adherence outcomes, a TB intervention may influence other factors that impact group maintenance, such as satisfaction of the needs of its members (Brawley & Paskevich, 1997). Thus, a second purpose of this study was to examine the impact of a TB program on another potential TB outcome: group task satisfaction. Past TB research in a youth sport setting (Newin et al., 2008) and group research examining satisfaction (Spink, Nickel, Wilson, & Odnokon, 2005) have found a positive relationship between TB and an improved sense of group functioning and group member satisfaction, respectively. As such, it was predicted that exercise club participants exposed to a TB intervention program would exhibit greater levels of satisfaction with how the group was func-

tioning around its task than those not exposed to such an intervention.

## Method

### Participants and Design

Participants were 141 youth (aged 13–18 years) who signed up to participate in a leader-directed exercise club within 12 rural high schools from 12 different communities (see Table 1 for community demographics across the 12 sites). As can be seen in Table 1, the communities where the schools were located were relatively small (on average, approximately 1,500 residents), middle income (on average, \$56,031, in comparison with a regional average of \$58,563), and had only a few neighborhood activity facilities. Most frequently, the only activity facilities apart from the school were a curling club and ice-skating rink. Each of these exercise clubs was directed by a teacher (9 males and 3 females) who had responded to a request to direct an exercise club outside of school hours. Following acceptance, each teacher was responsible for recruiting the participants from their respective schools. Recruitment by the teachers uniformly involved classroom announcements and posters displayed in the schools. A pretest-posttest control group design was used in this study.

Table 1  
*Community Demographics Across Sites*

School (N = 12)	Community size	SES (Median family income)	No. activity facilities
TB			
1	1560	68259	2
2	492	66182	2
3	4998	40640	3
4	4968	73580	3
5	472	38090	2
6	495	50347	2
Control			
7	342	59557	2
8	306	60184	2
9	1120	50888	2
10	530	58563	1
11	1743	61214	3
12	868	55015	2
Overall	1491	56031	2.2

*Note.* SES = socioeconomic status.

## Procedure

This study was approved by the University Institutional Ethics Review Board and the relevant school boards. Additional details of the intervention are presented elsewhere (Bruner & Spink, 2010), but an overview will be provided here. As highlighted in the introduction, the study design included two distinct components: (1) a standardized exercise program, and (2) a TB protocol. All teachers who volunteered to serve as leaders of the exercise clubs received individual training on the implementation and delivery of the first component of the study—the standardized exercise program. The standardized exercise program included 24–60 minute sessions that involved specified exercises delivered in a prescribed format—warm-up exercises (10 minutes), energy system exercises (20 minutes), dynamic strength training (20 minutes), and cooldown exercises (10 minutes). The standardized exercise program was delivered three times per week.

After the first 6 sessions (2 weeks), labeled Phase 1 (Baseline Phase), the schools were randomized into either TB or control groups. Two of the original 12 schools were eliminated from the randomization. One of the schools was excluded because the leader (female) withdrew from the study for personal reasons, and the other was excluded because the leader (male) did not attend all the baseline sessions. This resulted in five schools being randomly assigned to either a TB or control condition. In terms of participants, of the 122 youth ( $M = 15.5$  years) who remained from the 10 schools, 65 were assigned to the TB group and 57 to the control group (please refer to Figure 1 for a flow diagram of the TB intervention).

As noted in the introduction, after the Baseline Phase, the leaders in the TB group (4 males and 1 female) attended a workshop where they developed the TB strategies that they would implement when they returned to their club. At the workshop, the five TB factors housed within Carron and Spink's (1993) TB conceptual model were presented to the TB leaders and operationally defined. These specific factors included *group norms* and *individual positions* in the group structure category, *group distinctiveness* in the group environment category, and *individual sacrifices* and *communication and interaction* in the group processes category. After the five factors were presented and defined, the TB leaders participated in a brainstorming ses-

sion to develop TB strategies that were intended to foster cohesion around the implementation and execution of the exercise program activities (i.e., task cohesion). To help with this task, leaders were provided with information that described task cohesion. The brainstorming session culminated in leaders developing a personalized TB protocol that they could deliver to their class.

While a complete list of the TB strategies generated and implemented by the leaders is presented elsewhere (Bruner & Spink, 2010), an example for each of the five factors is presented here for purposes of illustration: (1) group distinctiveness—introduce the idea of creating a group name; (2) group norms—introduce the idea of creating a buddy system for attendance; (3) individual positions—introduce the idea of creating a set formation for warm-up/cooldown; (4) interaction/communication—suggest that participants might want to offer peer/partner feedback on exercise technique; and (5) individual sacrifices—suggesting that participants offer other group members the first choice of equipment during the sessions.

The rationale for allowing the leaders to generate their own personal TB strategies rather than using a standardized TB protocol was threefold. First, as leaders are likely to differ in personality and preferences, a strategy that might be effectively implemented by one leader might not work for another one. Second, de Charm's (1976) origin-pawn research has suggested that motivation is enhanced when individuals are given greater control over personal behavior, and this would best be accomplished by allowing leaders to select their own strategies. Finally, having leaders develop their own strategies was consistent with the protocol used in the original studies examining this TB model (cf., Carron & Spink, 1993; Spink & Carron, 1993).

After the workshop, the leaders returned to their class to deliver the TB strategies in a prescribed order over the next five exercise sessions and time (during the 10-minute warm-up and cooldown period of each class). This time period was the final stage of the TB protocol developed by Carron and Spink (1993) and labeled Phase 2 (Implementation Phase). For the remainder of the exercise sessions following implementation, labeled Phase 3 (Integration Phase), the TB leaders were asked to integrate

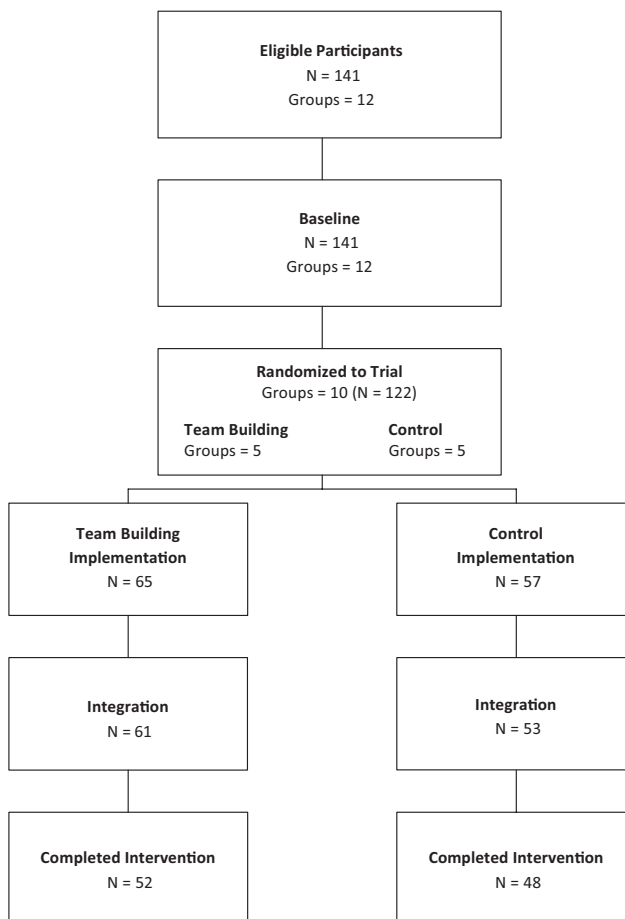


Figure 1. TB intervention flow chart.

and reinforce the TB strategies delivered during Phase 2.

The leaders in the control condition were not informed about the second component of the study—the TB protocol. They continued to conduct their remaining sessions (i.e., phases 2 and 3) using only the standardized exercise protocol that they had been trained to use for the first six sessions (Phase 1). To ensure the standardized exercise program and TB protocol were implemented as instructed, random visits were conducted across all sites. Observations by two researchers revealed that the standardized exercise program and TB intervention were implemented as prescribed. For the interested reader, a complete description of the site visit observations is reported elsewhere (Bruner & Spink, 2010).

## Measures

**Adherence.** Exercise adherence was evaluated in terms of attendance, lateness, and drop-out behavior. The assessment of three measures of adherence was consistent with the suggestion that the construct of adherence is multidimensional (Steers & Rhodes, 1978). Further, given that the physiological benefits of being active are commonly viewed as being associated with frequency and duration of the activity (Health Canada, 2002), different measures, such as attendance, lateness, and withdrawal were deemed worthy of examination.

Exercise adherence data were collected throughout all three phases of the program: Phase 1, Baseline (1 to 6 sessions); Phase 2, Implementation (7 to 11 sessions); and Phase 3,

Integration (12 to 23 sessions). Adherence data were not collected on Day 24, as this was the final testing day and all participants were personally contacted to request attendance at this final assessment session.

**Attendance.** Exercise leaders were provided with a daily attendance sheet for their class and instructed to record, with a check mark, whether participants were present or missed the entire session.

**Lateness.** Leaders were instructed to mark the participant as late on the attendance sheet if a participant arrived after the official starting time of the session. This was accomplished by recording an “L” on the attendance sheet.

**Dropout.** Participants who missed the final 9 consecutive sessions (i.e., more than 50% of the sessions during phases 2 and 3) were operationalized as dropouts. This operational definition of dropout was based on one that has been used previously in the group exercise environment (Spink & Carron, 1993).

**Group task satisfaction.** Group task satisfaction was measured using one scale from Reimer and Chelladurai’s (1998) multidimensional Athlete Satisfaction Questionnaire. The scale used was “team integration,” which is defined as satisfaction with members’ contributions and coordination of their efforts toward the group’s task. The four-item scale has previously demonstrated good construct validity and reliability (Reimer & Chelladurai, 1998). For this study, the wording for each of the four scale items was modified slightly to reflect the exercise setting context. Participants evaluated the extent to which they were satisfied with how the group members worked together during the exercise club sessions. As one example, an item in the original questionnaire that read, “Team member’s dedication to work together toward team goals” was modified to read, “Physical activity club member’s dedication to work together toward club goals.” Each item was scored on a 7-point Likert scale (1 = not at all satisfied to 7 = extremely satisfied). The four items were summed, with higher values representing greater group task satisfaction. Group task satisfaction was assessed twice—during the 6th and 24th session.

**Baseline demographics.** Demographic information for the schools (school size, eligible Grade 9–12 students, participation rate), leaders (number of years teaching, number of years at

school), and the participants (age, sex, baseline physical activity level, preference for being active with others in a group setting) was obtained during the first testing session (i.e., 6th session). Activity setting preference was assessed using a single item question, “Do you enjoy being active with others in a group setting?” with possible responses of “yes”, “no”, and “no preference.”

## Results

### Scale Reliabilities

**Group task satisfaction.** The reliability of the 4-item group task satisfaction subscale was assessed and found to be acceptable for use in the analyses ( $\alpha = .82$ ; .85 for pre- and posttesting, respectively).

### Baseline Demographics

No differences between the conditions were found on the school, leader, or participant demographic variables at baseline ( $ps > 0.05$ ). In addition, there was no difference between the participants in both conditions in preference for being active in a group setting ( $p > .05$ ).

## Main Analyses

### Adherence

The planned analysis involved the independent evaluation of the three adherence measures. Analyzing the adherence measures separately was consistent with previous research suggesting that measures of adherence should be viewed as independent of one another (Steers & Rhodes, 1978). As there was poor compliance by the leaders in recording the participants who were late, this measure was not analyzed. Thus, analyses were conducted for the adherence measures of dropout and attendance only.

**Dropout.** All participants who started the exercise program completed the baseline period (Phase 1). At the conclusion of Phase 3, 22 of the 122 participants were classified as dropouts, which included 13 participants in the TB clubs and 9 participants in the control clubs. As dropout behavior is typically expressed in terms of group size (e.g., 50% dropout from a class of 20), group data by exercise club was

used to assess dropout differences (Spink & Carron, 1993). A *t* test for independent means revealed that there was no significant difference between the TB (24.3%) and control conditions (19.2%) in terms of percentage dropout,  $t(8) = .54, p > .05$ .

**Attendance.** To assess changes in session attendance after the TB protocol had been implemented (i.e., during the integration phase, Phase 3), an ANCOVA was conducted with the 100 participants who had completed the program. An ANCOVA was selected because randomization of the participants into the TB and control exercise groups was not possible, as participants signed up for the exercise clubs at their respective schools. Thus, to control for any possible differences in pretest scores, initial differences in pretest scores for attendance were controlled (Tabachnick & Fidell, 2007). A second benefit associated with the use of the ANCOVA approach is that it addresses the issue of possible regression toward the mean that may be associated with quasi-experimental designs (Campbell & Kenny, 1999). Prior to the analysis, an independent sample *t* test was conducted to determine whether there were any differences in attendance during the five sessions when the intervention was being introduced to the participants (Phase 2). The *t* test revealed that the means for the TB ( $M = 78.8\%$ ) and control ( $M = 71.2\%$ ) groups were not significantly different in terms of attendance during the implementation phase,  $t(98) = 1.48, p > .05$ .

The results from the ANCOVA revealed that session attendance during the integration phase was significantly higher in the TB ( $M = 74\%$ ) than the control condition ( $M = 60\%$ ),  $F(2, 97) = 10.19, p < .001$ , after controlling for baseline attendance. The calculation of an effect size yielded a Partial  $\eta^2 = .174$ , which represents a small effect (Cohen, 1992).

### Group Task Satisfaction

The second hypothesis proposed that exercise club participants exposed to a TB intervention would report higher levels of group task satisfaction. ANCOVA results revealed that the mean for the TB group ( $M = 22.9$ ) was significantly higher than the control group ( $M = 20.5$ ),  $F(2, 96) = 30.489, p < .001$ , at the end of the intervention. The calculation of the

effect size revealed a Partial  $\eta^2 = .388$ , indicating a small to medium effect (Cohen, 1992).

### Discussion

Previous studies have reported a positive relationship between TB and several measures of adherence in adult exercise settings (Carron & Spink, 1993; Spink & Carron, 1993). The present study found support for the TB-attendance relationship in a youth population. Participants in the TB group attended a significantly higher percentage of workout sessions following the introduction of the TB strategies (i.e., during the integration phase) than participants in the control condition.

These findings are consistent with those of Estabrooks and Carron (1999), who found that older adults in a TB group attended more than 90% of their classes as compared to those in the control group, who attended 65% of their classes. The findings also parallel the results of Watson et al. (2004) who reported that attendance in an ongoing exercise class for the elderly increased by over 22% during a 12-week TB intervention. The current attendance results also are consistent with those of Annesi (1999), who found that young adult participants in a brief group-based exercise intervention attended significantly more workout sessions than those in a control condition.

In addition to providing initial empirical evidence for the TB-attendance relationship with a youth population, the study findings lend support for the targeted group mechanism, task cohesion (that was highlighted in the previous study describing this TB intervention, i.e., Bruner & Spink [2010]) as a “mechanism of action” (cf. Yalom & Leszcz, 2005). More specifically, the definition of cohesion as the tendency of a group to stick together in the pursuit of important goals (Carron, Brawley, & Widmeyer, 1998) is congruent with group maintenance and consistent with the results of the current study.

While the attendance results of this study support the TB-adherence relationship, the relationship between TB and the other measure of adherence examined—dropout behavior—was not supported. No relationship was found between TB and dropout behavior in this study. This stands in contrast to past research where

participants exposed to a TB intervention were less likely to drop out than participants not exposed to the intervention (Spink & Carron, 1993).

One possibility to explain why the current dropout results might differ from those previously reported may be that the social stigma associated with dropping out in this study may have been heightened by the context. Specifically, as this study was conducted in a school setting, the ongoing presence of fellow exercisers (classmates) and the exercise leader (a teacher at the school) outside of the exercise club setting may have created implicit pressures to maintain membership in the group while it was still operational. This contrasts with research conducted in other settings where differences in dropout rates were evident (Spink & Carron, 1993). In those studies, the research was conducted in private, nonschool settings. As such, it would be much easier for exercisers to avoid other participants, if they so chose, once they had withdrawn from the exercise program.

A related explanation to account for the present dropout results may involve the rural school context. It might be assumed that the small sizes of the participating rural schools (i.e., average school population of 231 students) would increase the frequency of interactions among the exercise group members and the leader outside of the exercise club, thus making dropping out more visible and, hence, a more difficult decision. Taken together, the school setting and rural context may have enhanced the social stigma associated with dropping out and contributed to the failure to find differences in dropout behavior.

In line with previous TB research (Spink & Carron, 1993), a third measure of adherence (lateness) was assessed. However, a lack of compliance on the part of the leaders to record participant lateness precluded analysis. Based upon previous TB research, this finding was unexpected. One possible reason to account for the poorer compliance may have been the extensive involvement required by the exercise leaders to organize the equipment and stations for the standardized exercise component prior to each session (e.g., setting up exercise stations, setting up equipment). Given this extensive

setup procedure and its attendant time commitment, it is possible that leader attention was directed to setup versus seeing who arrived on time. Given the poor compliance in recording this measure, future research would benefit from recording lateness in a different way (e.g., using an independent recorder).

In addition to lateness, there are other dimensions of adherence in a youth exercise setting that could be examined. One dimension of adherence worth examining is the perceived effort of the participants at the exercise sessions. While examination of this form of adherence has been done in a sport setting (e.g., Prapavessis & Carron, 1997; Spink & Odnokon, 2000), it also would be important to examine from a health perspective, as exercise intensity (i.e., perceived effort) is a key component of the behavioral dose-response prescription presented to individuals wishing to achieve health benefits from being active (Health Canada, 2002).

A second purpose of the study was to examine the relationship between TB and group task satisfaction. As found in the study, individuals in the TB condition reported higher levels of satisfaction with the task aspects of the group than those in the control condition. This finding was consistent with the fact that the TB intervention used in this study targeted the task aspects of the group (Bruner & Spink, 2010). It also extends previous research identifying a link between TB and an individual measure of task satisfaction (Carron & Spink, 1993) to a measure of group task satisfaction. The study results also lend support to past research in the sport setting, which has demonstrated a link between perceptions of the group and group task satisfaction (Spink et al., 2005).

In addition to being an important independent outcome in the TB intervention, it is also possible that group task satisfaction might serve as a mediator in the TB-adherence relationship. Satisfaction has been associated with a measure of adherence in an exercise setting (Remers, Widmeyer, Williams, & Myers, 1995). As such, it is possible that satisfaction with the group's functioning toward the task (group task satisfaction) may serve as an important mechanism mediating the TB-adherence relationship in a youth population. Further, given the finding of a positive relationship between cohesion and group task satisfaction in other research (Spink et al., 2005), it also is plausible that group task



satisfaction and cohesion might serve as cascading mediators between TB and adherence (cf. Bauman, Sallis, Dzewaltowski, & Owen, 2002). One possible path might have TB leading to increased cohesion, as previously reported by Bruner and Spink (2010), which leads to increased task satisfaction, thereby resulting in better adherence. As the design of this study precluded the examination of mediation, this might be an important direction for future research.

This field study was not without its limitations. Similar to many previous group-based field studies, the researchers were constrained by the existing situation (e.g., number of sites, participants available). The low number of participants at each of the 10 sites created one issue, as it precluded the use of a multilevel approach to examine any possible effects associated with the nesting of individuals within the exercise clubs (cf. Spink et al., 2005). The authors recognize the potential for nesting of participants within exercise clubs. However, the low number of participants at the 10 sites did not meet the recommended sample necessary to estimate the intercept or slope parameters for each site (Patterson & Goldstein, 1991), so analysis was conducted at the individual level. However, the level of the analysis was not perceived to be an issue for adherence given the individual nature of the research question and behavior (cf. Carron & Brawley, 2008). The univariate analytic approach taken for group task satisfaction was also deemed appropriate given the findings of previous research indicating individual level variance associated with this group construct (Spink et al., 2005).

A second limitation involved the fact that the TB strategies were not pilot tested or reviewed by experts. This was not possible, as the leaders developed their own personal strategies. However, we take some solace in the fact that this process (i.e., not employing pilot testing strategies) has been used successfully in past TB interventions targeting other groups (Carron & Spink, 1993; Estabrooks & Carron, 1999; Spink & Carron, 1993; Watson et al., 2004). Another possible limitation may have been that the instructor's leadership (i.e., interaction style with participants) was not assessed or controlled for in the intervention. While it is possible that the leadership variables may have contributed to the study attendance findings, previous research

has found no support for the direct role of leadership on exercise adherence in a TB study (Carron & Spink, 1993). However, other research in the exercise and sport settings has found cohesion to mediate the relationship between leadership and adherence (Loughead & Carron, 2004; Spink, 1998). Given that cohesion was a key component in this TB intervention (see Bruner & Spink, 2010), further examination of the role of leadership on TB and group-based exercise programs appears warranted.

While acknowledging these limitations, the study also has a number of strengths. First, the TB-attendance finding builds upon the previous study examining the implementation of this intervention (Bruner & Spink, 2010). In that study, the relationship between the TB intervention and its proposed mechanism was established. The results of the current study add to this by demonstrating that the TB intervention was also associated with an important outcome of the group intervention—the attendance behavior of youth exercise participants. Collectively, the findings are consistent with previous TB research (Estabrooks & Carron, 1999; Spink & Carron, 1993) and the idea proposed years ago by Cartwright (1951) that groups may have a powerful influence on their members. Second, to our knowledge, this was the first study to examine the effects of TB on the adherence behavior of youth in an exercise setting. Third, the study protocol was unique, as it involved the implementation of two separate but key components: a standardized exercise component and a TB component. The inclusion of a standardized exercise program for both the TB and control groups represented an improvement in design from previous research and permitted a clearer examination of the effects of the TB program on adherence measures. This builds on past research wherein the best that could be said was that adherence effects were associated with a combination of TB protocol and the exercise program (Spink & Carron, 1993).

A final strength of the study was the use of a school setting to deliver the intervention. Schools have been identified previously as an attractive setting to effectively provide and promote physical activity for youth, with a specific emphasis placed on examining physical activity opportunities beyond the school day (Pate et al., 2006). The positive findings in this study, in-

cluding the high completion rate of the exercise program (i.e., 82%; 100 of 122 youth), provide preliminary evidence that school-based TB activity programs can be run successfully outside of school hours. Furthermore, the school setting supports the vital role that schools may play in promoting health in rural communities. Rural youth face a number of unique, additional barriers to physical activity (e.g., lack of activity infrastructure as noted in this study) in comparison to their urban counterparts (Groft, Hagan, Miller, Cooper, & Brown, 2005; Hartley, 2004; Moore, Davis, Baxter, Lewis, & Yin, 2008). In combination with observed health disparities between rural-urban youth (e.g., Liu, Bennett, Harun, & Probst, 2008), and recent calls for effective interventions programs targeting rural youth (Bruner, Lawson, Pickett, Boyce & Janssen, 2008; Liu et al., 2008; Moore et al., 2008), schools represent an important medium for reaching and delivering physical activity programs to youth in rural settings.

Groups are a pervasive and persistent part of our lives and have powerful effects on human behavior (cf. McGrath, 1984). While group research has been well documented in the activity domain (cf. Carron, 1981), minimal research has attempted to understand how the power of groups can influence the physical activity behavior of youth. This study provides preliminary evidence for the positive influence of a group-based team building intervention on the physical activity adherence of youth.

## References

- Anderson, L., Harrow, M., Sardinaha, L., Froberg, K., Ekelund, U., Brage, S., & Anderssen, J. (2006). Physical activity and clustered cardiovascular risk in children: A cross-sectional study (The European Youth Heart Study). *Lancet*, *368*, 299–304.
- Annesi, J. J. (1999). Effects of minimal group promotion on cohesion and exercise adherence. *Small Group Research*, *30*, 542–557.
- Baranowski, T., & Stables, G. (2000). Process evaluation of the 5-a-Day projects. *Health Education & Behavior*, *27*, 157–166.
- Bauman, A. E., Sallis, J. F., Dzewaltowski, D. A., & Owen, N. (2002). Toward a better understanding of the influence on physical activity. The role of determinants, correlates, causal variables, mediators, moderators, and confounders. *American Journal of Preventive Medicine*, *23*, 5–14.
- Beauchamp, M. R., Carron, A. V., McCutcheon, S., & Harper, O. (2007). Older adults' preferences for exercising alone versus in groups: Considering contextual congruence. *Annals of Behavioral Medicine*, *33*, 200–206.
- Brawley, L. R. (1990). Exercise adherence: Its impact on public health. *Journal of Sport & Exercise Psychology*, *12*, 202–204.
- Brawley, L. R., & Paskevich, D. M. (1997). Conducting team building research in the context of sport and exercise. *Journal of Applied Sport Psychology*, *9*, 11–40.
- Brawley, L. R., Rejeski, W. J., & Lutes, L. (2000). A group-mediated cognitive-behavioral intervention for increasing adherence to physical activity in older adults. *Journal of Applied Biobehavioral Research*, *5*, 47–65.
- Bruner, M. W., Lawson, J., Pickett, W., Boyce, W., & Janssen, I. (2008). Rural Canadian adolescents are more likely to be obese compared with urban adolescents. *International Journal of Pediatric Obesity*, *3*, 205–211.
- Bruner, M. W., & Spink, K. S. (2010). Evaluating a team building intervention in a youth exercise setting. *Group Dynamics: Research, Theory, and Practice*, *14*, 304–317.
- Burke, S., Carron, A., Eys, M., Ntoumanis, N., & Estabrooks, P. (2006). Group versus individual approach? A meta-analysis of the effectiveness of interventions to promote physical activity. *Sport & Exercise Psychology Review*, *2*, 19–35.
- Campbell, D. T., & Kenny, D. A. (1999). *A primer on regression artifacts*. New York, NY: Guilford Press.
- Carron, A. V. (1981). Processes of group interaction in sport teams. *Quest*, *33*, 245–270.
- Carron, A. V., & Brawley, L. R. (2008). Group dynamics in sport and physical activity. In T. Horn (Ed.), *Advances in sport psychology* (pp. 213–237). Champaign, IL: Human Kinetics.
- Carron, A. V., Brawley, L., & Widmeyer, N. (1998). The measurement of cohesiveness in sport groups. In J. L. Duda (Ed.), *Advancement in sport and exercise psychology measurement* (pp. 213–226). Morgantown, WV: Fitness Information Technology.
- Carron, A. V., Hausenblas, H. A., & Mack, D. (1996). Social influence and exercise: A meta-analysis. *Journal of Sport & Exercise Psychology*, *18*, 1–16.
- Carron, A. V., & Spink, K. S. (1993). Team building in an exercise setting. *The Sport Psychologist*, *7*, 8–18.
- Carron, A. V., & Spink, K. S. (1995). The group size-cohesion relationship in minimal groups. *Small Group Research*, *26*, 86–105.
- Cartwright, D. (1951). Achieving change in people: Some applications of group dynamics theory. *Human Relations*, *4*, 381–393.

- Cohen, J. (1992). A power primer. *Psychology Bulletin*, *112*, 155–159.
- Conduct Problems Prevention Research Group. (2004). The fast track experiment: Translating the developmental model into prevention design. In J. Kupersmidt & K. Dodge (Eds.), *Children's peer relations: From development to intervention* (pp. 181–208). Washington, DC: American Psychological Association.
- de Charms, R. (1976). *Enhancing motivation: Change in the classroom*. New York, NY: Halstead.
- Dishman, R. K., & Buckworth, J. (1996). Increasing physical activity: A quantitative synthesis. *Medicine & Science in Sports & Exercise*, *28*, 706–719.
- Estabrooks, P. A., & Carron, A. V. (1999). Group cohesion in older adult exercisers: Prediction and intervention effects. *Journal of Behavioral Medicine*, *22*, 575–588.
- Groft, J. N., Hagen, B., Miller, N. K., Cooper, N., & Brown, S. (2005). Adolescent health: A rural community's approach. *Rural and Remote Health*, *5*, 1–15.
- Hartley, D. (2004). Rural health disparities, population health, and rural culture. *American Journal of Public Health*, *94*, 1675–1678.
- Health Canada. (2002). Canada's physical activity guide for youth (N. H39–611/2002-1E). Ottawa, Ontario: Health Canada.
- Kirkcaldy, B. D., Shepard, R., & Siefen, R. (2002). The relationship between physical activity and self-image and problem behavior among adolescents. *Social Psychiatry and Psychiatric Epidemiology*, *37*, 544–550.
- Klein, C., Granados, D., Salas, E., Le, H., Burke, C., Lyons, R., & Goodwin, G. (2009). Does team building work? *Small Group Research*, *40*, 181–222.
- Liu, J., Bennett, K. J., Harun, N., & Probst, J. C. (2008). Urban-rural differences in overweight status and physical inactivity among US children aged 10–17 years. *The Journal of Rural Health*, *24*, 407–415.
- Loughead, T. M., & Carron, A. V. (2004). The mediating role of cohesion in the leader behavior-satisfaction relationship. *Psychology of Sport and Exercise*, *5*, 355–371.
- Massie, J. F., & Shephard, R. J. (1971). Physiological and psychological effects of training: A comparison of individual and gymnasium programs, with characterization of the exercise "drop-out." *Medicine & Science in Sports*, *3*, 110–117.
- McGrath, J. (1984). *Groups: Interaction and performance*. Englewood, NJ: Prentice Hall.
- Meichenbaum, D., & Turk, D. (1987). *Facilitating treatment adherence: A practitioner's guidebook*. New York, NY: Plenum Press.
- Miller-Johnson, S., & Costanzo, P. (2004). If you can't beat 'em . . . induce them to join you: Peer-based interventions during adolescence. In J. Kupersmidt & K. Dodge (Eds.), *Children's peer relations: From development to intervention* (pp. 209–222). Washington, DC: American Psychological Association.
- Moore, J. B., Davis, C. L., Baxter, S. D., Lewis, R. D., & Yin, Z. (2008). Physical activity, metabolic syndrome, and overweight in rural youth. *The Journal of Rural Health*, *24*, 136–142.
- Newin, J., Bloom, G. A., & Loughead, T. M. (2008). Youth ice hockey coaches' perceptions of a team building intervention program. *The Sport Psychologist*, *22*, 54–72.
- Newman, B. (1984). Expediency as benefactor: How team building saves time and gets the job done. *Training and Development Journal*, *38*, 26–30.
- Pate, R., Davis, M., Robinson, T., Stone, E., McKenzie, T., & Young, J. (2006). Promoting physical activity in children and youth: A leadership role for schools. *Circulation*, *114*, 1214–1224.
- Patterson, L., & Goldstein, H. (1991). New statistical methods for analyzing social structures: An introduction to multilevel methods. *British Education Research Journal*, *17*, 387–393.
- Prapavessis, H., & Carron, A. V. (1997). Cohesion and work output. *Small Group Research*, *28*, 294–301.
- Reimer, H. A., & Chelladurai, P. (1998). Leadership and satisfaction in athletics. *Journal of Sport & Exercise Psychology*, *17*, 276–293.
- Remers, L., Widmeyer, W. N., Williams, J. M., & Myers, L. (1995). Possible mediators and moderators of the class size-member adherence relationship in exercise. *Journal of Applied Sport Psychology*, *7*, 38–49.
- Senecal, J., Loughead, T. M., & Bloom, G. (2008). A season-long team-building intervention: Examining the effect of team goal setting on cohesion. *Journal of Sport & Exercise Psychology*, *30*, 186–199.
- Spink, K. S. (1998). Mediation effects of social cohesion on the leadership behavior-intention to return relationship in sport. *Group Dynamics: Theory, Research, and Practice*, *2*, 92–100.
- Spink, K. S., & Carron, A. V. (1993). The effects of team building on the adherence patterns of female exercise participants. *Journal of Sport & Exercise Psychology*, *15*, 39–49.
- Spink, K. S., Nickel, D., Wilson, K., & Odnokon, P. (2005). Using a multilevel approach to examine the relationship between task cohesion and team task satisfaction in elite ice hockey players. *Small Group Research*, *36*, 539–554.
- Spink, K. S., & Odnokon, P. (2000). Examining the effect of psychological climate on perceived effort in a sport setting. *Journal of Sport & Exercise Psychology*, *22*, 103.

- Steers, R., & Rhodes, S. (1978). Major influences on employee attendance: A process model. *Journal of Applied Psychology, 63*, 391–407.
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Boston, MA: Allyn & Bacon.
- Tremblay, M. S., Shields, M., Laviolette, M., Craig, C. L., Janssen, I., & Connor Gorder, S. (2009). Fitness of Canadian children and youth: Results from the 2007–2009 Canadian Health Measures Survey. *Health Reports, 21* (Catalogue no. 82–003-XPE). Ottawa, Canada: Statistics Canada.
- Watson, J., Martin-Ginis, K., & Spink, K. (2004). Team building in an exercise class for the elderly. *Activities, Adaptation & Aging, 28*, 35–47.
- Wilson, K. S., & Spink, K. S. (2009). Social influence and activity in older females: Does activity preference matter? *Psychology of Sport and Exercise, 10*, 481–488.
- Yalom, I. D., & Leszcz, M. (2005). *Theory and practice of group psychotherapy* (5th ed.). Cambridge, MA: Basic Books.

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