The Impact of an Experiential Education Program on the Self-Perceptions and Perceived Social Regard of Physical Education Students

Sandra L. Gibbons,1 Vicki Ebbeck,2 Rebecca Y. Concepcion,3 and Kin-Kit Li4
1University of Victoria; 2Oregon State University; 3Pacific University; 4City University of Hong Kong

This study investigated the effectiveness of an 8-month Team Building through Physical Challenges (TBPC; Glover & Midura, 1992) program on the self-perceptions and perceived social regard of middle school physical education students (N = 1802). Data were analyzed using multilevel analyses where midpoint and final evaluations were conducted separately. Results revealed that at the midpoint evaluation, students in the experimental and control conditions were not different on any of the subscales assessed. At the end of the program, students in the experimental condition, compared with those in the control condition, showed significantly higher scores on 6 of the 10 subscales assessed and the effect sizes were medium to very large. The findings support the effectiveness of the TBPC program in creating positive psychological outcomes for students in a field-based setting.

Keywords: intervention, self-concept, children, middle school

Self-perceptions and perceived social regard play a critical role in how children feel and behave (Harter, 1999). In light of this, it is important to identify interventions that positively impact the perceptions of children. Participation in experiential education activities that use physical challenges has been recognized as one such intervention (Garst, Scheider, & Baker, 2001; Socha, Potter, & Downey, 2003). The term experiential education encompasses a somewhat wide array of activities that generally involve problem-solving, group cooperation, and reflection on the experience. The purpose of this study was to assess the effectiveness of a Team Building through Physical Challenges (TBPC; Glover & Midura, 1992) program.
Of particular interest was the extent to which the TBPC program would enhance the self-perceptions and perceived social regard of middle school physical education students.

**Indicators of Program Effectiveness**

Self-perceptions and perceived social regard that served in the current study as indicators of the TBPC program effectiveness are both represented in Harter’s (1987) original mediational model of self-worth. The model depicts self-worth directly, and to a greater degree indirectly via affect, influencing motivated behavior. Self-worth, according to Harter, is the degree to which an individual likes him- or herself as a person. As stipulated by the model, there are two key antecedents of self-worth. The first is self-perceptions of competence or adequacy in domains deemed to be important by the individual. The second is what an individual perceives significant others think of him or her. Harter (1999) has suggested that intervention strategies should target these antecedents of self-worth instead of attempting to impact self-worth directly. Moreover, Harter (1985a, 1985b) has developed self-report measures to use with children that assess both self-perceptions and perceived social regard. The self-perception measure assesses global self-worth along with perceived scholastic competence, social acceptance, athletic competence, physical appearance, and behavioral conduct. The social regard measure assesses perceived positive regard from others including parents, teachers, classmates, and close friends. Harter (1985b) actually titled the measure of perceived social regard the *Social Support Scale for Children*, which reflects Harter’s notion that perceived social regard is one of many forms of social support.

Both self-perceptions and perceived social support have been linked to multiple positive affective and behavioral outcomes with children. For example, with regard to self-perceptions, a higher self-concept in the areas of general self, general school, parent relations, and peer relations has predicted lower levels of anxiety and depression in middle school children (Yang, 2002). Similarly, 42% of the variance in scores on a depression inventory for children could be explained by self-evaluations (Moens, Braet, & Timbremont, 2005). In terms of behavioral outcomes, prior academic self-concept along with actual achievement has been found to have positive effects on subsequent self-concept and achievement (Marsh & Craven, 2006). Positive reciprocal effects have been reported between physical self-concept and physical activity levels (Trautwein, Gerlach, & Lüdtke, 2008), while peer relations self-concept has been found to mediate the relationship between physical coordination ability and energy expenditure (Poulsen, Ziviani, & Cuskelly, 2008). A child’s self-concept also influences bullying behavior having itself been influenced by interparental discord (Christie-Mizell, 2003).

Perceived social support from parents, teachers, and peers acts as a strong protection mechanism for children and adolescents (Bernard, 2004). For example, studies have shown a significant buffering effect of parental support on stress and anxiety (Demaray & Malecki, 2002). As well, Kaltiala-Heino, Rimpela, Rantanen, and Laippala (2001) found that high rates of perceived social support are related to decreased levels of depression. Perceptions of social support also play a significant part in influencing motivation in a variety of domains. For instance, the perception of social support from peers had a significant positive influence on the motivation to stay involved in a sport activity (Patrick et al., 1999). Similarly, social support
by both peers and parents was predictive of a student’s commitment to scholarly goals (Wentzel, 1998). High levels of social support were also associated with fewer behavioral problems with a sample of fifth to eighth graders (DuBois et al., 2002).

**Experiential Education Programs**

Given the numerous desirable outcomes associated with both self-perceptions and perceived social support, it follows that the development of interventions targeting these concepts are critical. The physical activity context has been used to offer a variety of experiential education programs in the outdoor environment. These programs use experiential education methodology, where experiential education is operationally defined as learning by doing with reflection (Priest & Gass, 1997) and encompasses components of outdoor education and adventure education. Many of these programs have been examined for their effectiveness with regard to enhancing self-perceptions and perceived social support. For example, in their meta-analysis of 43 research studies in the previous 25 years, Cason and Gillis (1994) found adventure programs to have an overall positive effect on a range of psychological outcomes including self-concept. Notable in the 1980s, Marsh, Richards, and Barnes (1986a, 1986b) found an Australian Outward Bound program to be effective at increasing self-conceptions in those domains considered before the start of the study to be most pertinent to the goals of the program. More recently, Neill and Dias (2001) found that participation in an Outward Bound program was particularly effective at enhancing the psychological resilience of a group of young adults. Most markedly, they identified social support as making a central contribution to the significant result. As well, Garst, Scheider, and Baker (2001) found positive changes in self-perceptions of a group of adolescents as a result of their participation in an outdoor adventure program, and Jelalian and Mahlenbeck (2002) reported an experiential education program focused on improving self-concept and peer relations was effective with obese adolescents.

In their comprehensive review of the effects of outdoor adventure programs, Hattie, Marsh, Neill, and Richards (1997) suggested that the two major concepts of “challenge” and “support” worked together to produce the positive changes. Accordingly, such programs endeavored to offer controlled exposure to challenging experiences within a warm and supportive group atmosphere. Hattie et al. further proposed that a challenging experience might be harmful if appropriate support is not provided. In view of the evidence for adventure programs and positive research results, efforts have been made to make the experiential education concepts from the outdoor adventure context accessible to physical education teachers. Toward this goal, Glover and Midura (1992) adapted a range of outdoor adventure team-building tasks for children in upper elementary and middle school in the design of their Team Building through Physical Challenges (TBPC) program. The TBPC tasks were modified for the gymnasium and most often use readily available physical education equipment. The focus of the TBPC tasks is on positive group interaction to overcome challenges, very similar to the concepts of challenge and support identified by Hattie et al. As observed by Panicucci (2002, p. 1), “Adventure programming is not reinventing the wheel of physical education; it is meant to supplement what already exists in the school curriculum. Adventure adds new activities, and a twist, to teaching and learning that [the teacher and students] will find exhilarating and powerful.”
Gibbons and her colleagues have examined the effectiveness of the TBPC program when incorporated into physical education. Gibbons and Black (1997) examined the impact of the TBPC program on the self-perceptions of 120 seventh and eighth grade students (12 and 13 year olds) in middle school physical education. This 5-month intervention had students in the treatment groups participate in a TBPC task every second week as part of their physical education class. Students in the control groups continued in their regular physical education class without the TBPC tasks. Other than being shorter in duration, this intervention was comparable to the present investigation in terms of content and implementation schedule. Results were analyzed across gender and indicated significant pre- to posttest increases for the treatment classes compared with the control classes on four of the six dependent variables (global self-worth, perceived scholastic competence, perceived social acceptance, perceived athletic competence), while no change was reported in perceived physical appearance or perceived behavioral conduct.

Ebbeck and Gibbons (1998) used a similar 8-month intervention with 120 male and female sixth and seventh grade students in middle school physical education classes. The students ranged in age from 10 to 12 years. By the end of intervention administered every second week, male students in the treatment condition were significantly higher on perceptions of global self-worth, social acceptance, athletic competence, and physical appearance than male students in the control condition (no change was reported in perceived scholastic competence or perceived behavioral conduct). In addition, by the end of the intervention female students in the treatment condition were significantly higher on all six self-perceptions than female students in the control condition.

Most recently, Gibbons and Ebbeck (in press) examined the merits of the TBPC program with middle school physical education students, but in gender-segregated classes as opposed to coeducational classes that were used in the two earlier studies. The sample was comprised of 260 students in Grades 7 and 8 who ranged in age from 11 to 13 years. The 5-month intervention was administered every second week to the treatment classes and was associated with positive outcomes. Following the TBPC program, students in the treatment condition were found to have significantly higher scores than students in the control condition on all of the self-perceptions except perceived physical appearance for male students and perceived scholastic competence for female students. Examination of the effect sizes suggested that the TBPC program again somewhat advantaged female students even in the gender-segregated classes, although the overriding finding was that the program was associated with beneficial outcomes for both male as well as female students.

**Purpose of the Present Study**

In terms of the impact of the TBPC program on self-perceptions, multiple studies to date by Gibbons and colleagues have shown encouraging trends. The authors nevertheless suggested further research was needed first to better understand the rate of change in self-perceptions. Previous studies have collected data only before and following the intervention program, whereas a greater understanding of when change occurs and the order of any change within variables would be gained from an additional midpoint data collection. Gibbons and colleagues also advocated for examining the potential influence of the intervention on other indicators of program effectiveness beyond self-perceptions. Perceived social regard warrants
consideration because (a) the construct, like self-perceptions, is depicted in Harter’s (1987) mediational model of self-worth, (b) perceived social support has been shown in the literature to be associated with positive affective and behavioral outcomes, and (c) an examination of possible social consequences has practical relevance for an intervention program grounded in cooperative activities.

Gibbons and colleagues also recognized the existing limitation in the earlier studies where the intervention was administered to different classes within a school yet students were used as the unit of analysis because there was an insufficient number of classes to use class as the unit of analysis. The statistical power to detect treatment effects with meaningful effect sizes decreases along with the sample size. Using the student-level data, however, conceptually failed to evaluate the program at the appropriate unit of analysis, and statistically used the number of students as the “effective” sample size for computing the standard errors of the program effects as if students in the same classroom were independent observations. This microlevel analysis inflates the probability of detecting program effects using incorrect standard errors (see Snijders & Bosker, 1999). Hence, the nesting structure of the data should be considered for such research designs. Subsequently, the authors recommended the use of multivariate repeated measures analyses be replaced with multilevel analyses. In response to these suggestions, this study extended the existing research on the TBPC program by (a) assessing outcome variables at midintervention in addition to pre- and postintervention, (b) including perceived social regard as well as self-perception variables, and (c) providing a test of the significance of the program at the level of school where the intervention was administered while considering the nested structure of the classes within schools and students within classes.

The primary purpose of this study was to examine the effect of participation in the TBPC program incorporated into physical education classes on the self-perceptions and perceived social regard of middle school students. Given earlier studies demonstrated that the TBPC program was associated with improvement in self-perceptions (Ebbeck & Gibbons, 1998; Gibbons & Black, 1997; Gibbons & Ebbeck, in press), we hypothesized that students in the intervention classes would record higher self-perceptions than students in the control classes at both time periods particularly in those domains shown to be consistently responsive to the program including global self-worth, perceived scholastic competence, perceived social acceptance, and perceived athletic competence. In addition, considering the prominence of valuing and supporting teammates in all TBPC tasks, we hypothesized that students in the intervention classes would record higher perceptions of social regard than their counterparts in the control classes specifically in terms of perceived positive regard from classmates. We also hypothesized that students in the intervention compared with control classes would perceive higher levels of positive regard from teachers who, as a function of the TBPC program, got to observe students in a less traditional realm of physical activity, encourage them through the struggles, and praise them for the successes. Of secondary interest was the examination of any gender differences given reactions to the intervention have varied by gender in previous studies. Consistent with the findings by Ebbeck and Gibbons (1998) and Gibbons and Ebbeck (in press), we hypothesized that all students exposed to the TBPC would benefit, although the female as opposed to male students would be particularly advantaged.
Method

Participants

Physical education students \( (N = 1,802) \) representing 72 coeducational classes in Grades 6, 7, and 8 were recruited from four large middle schools in Canada. The four schools were part of the same school district located in a large Canadian city. Students ranged in age from 10 to 13 years \( (M = 12.28; SD = .85) \). The number of schools, classrooms, students, and the gender composition were balanced between the experimental and control conditions by the design of the study. Both the experimental and control conditions consisted of 36 classrooms within two schools. Hence, within school intervention contamination (i.e., exposure of the intervention by the teachers in the control condition) was prevented. The treatment and control conditions included 909 students and 893 students, respectively. The sample included an approximately even proportion of both genders with 51% female \( (n = 932) \) and 49% male \( (n = 870) \) students.

Measures

This study used the Self-Perception Profile for Children (SPPC; Harter, 1985a) to assess self-perceptions. The SPPC includes the following six subscales: global self-worth, perceived scholastic competence, perceived social acceptance, perceived athletic competence, perceived physical appearance, and perceived behavioral conduct. Scores on individual items range from a low value of 1 to a high value of 4, and six items are averaged for each of the subscales. The scale employs a structured alternative response format that has been shown to reduce the tendency to give socially desirable responses (Harter, 1982). Respondents first decide which of two statements is most like them. For example, “Some kids don’t like the way they are leading their life BUT Other kids are pretty pleased with themselves.” Respondents then record whether the statement most like them is “sort of true for me” or “really true for me.” Harter (1985a) has reported evidence of internal consistency, reliability, factorial validity, and construct validity with samples including children in Grades 6, 7, and 8. One item assessing global self-worth—“Some kids are usually happy with themselves as a person BUT Other kids are often not happy with themselves”—was deleted in the current study to achieve an acceptable Cronbach alpha coefficient of .70.

Perceived social regard was measured using the Social Support Scale for Children (SSSC; Harter, 1985b). This scale measures perceptions of positive regard from four different sources including parents, teachers, classmates, and close friends. Each of the four subscales uses the same forced choice format as the SPPC. Thus, items are assigned a score from 1 to 4 and the six items that comprise each subscale are averaged to create a total subscale score. Psychometric properties of the measure have been established as Harter has reported internal consistency reliability (Harter, 1985b) as well as construct validity (Harter, 1993). Two items assessing positive regard from teachers were deleted in the present investigation to achieve an acceptable Cronbach alpha coefficient: “Some kids don’t have a teacher who is fair to them BUT Other kids do have a teacher who is fair to them” and “Some kids have a teacher who treats them like a person BUT Other kids don’t have a teacher who treats them like a person.”
TBPC Program

The TBPC program involves a sequence of 30 cooperative learning tasks in physical education that gradually increase in their physical, social/emotional, and intellectual challenge. The tasks are identified as either introductory, intermediate, or advanced. TBPC tasks may range from balancing an entire group on a small square of carpet to helping all group members physically maneuver through a demanding obstacle course. To add to a sense of imagination and adventure, a thematic approach is adopted in that a box horse becomes a desert island, a balance beam becomes a bridge across a swamp, and a gymnastics mat becomes a raft in the ocean. The onus is on group members to formulate and employ strategies for completing each task. Tasks are designed to maximize the necessity for cooperation and teamwork, communication, and trust between group members. Successful solutions to tasks depend upon the extent to which group members cooperate, trust, and communicate with one another.

The TBPC program stresses the following: (a) specific roles for each task; (b) positive group interactions; (c) task rules be kept (if rules are broken, consequences must be suffered and sacrifices made); and, (d) posttask reflection. The purpose of the posttask reflection is to help participants identify and discuss how their group managed the learning outcome of each task (e.g., cooperating with group members). Teachers also used posttask reflection to ensure they placed sufficient emphasis on the learning outcomes. The TBPC intervention was incorporated into the prescribed provincial physical education curriculum. This curriculum provides for instruction across the following five movement categories: alternative-environment activities, dance, games, gymnastics, as well as individual and dual activities. Time allocation for physical education for all classes averaged 200–225 min each week for the duration of the school year.

Procedures

Upon receiving human research ethics approval from the affiliated university and school district, and the return of informed consent as well as assent forms from parents and students, the experimental protocol was implemented between October and May of the school year. Four middle schools were randomly assigned to either the treatment or control conditions. Twenty-four classes at each grade level (6, 7, 8) served as either the control classes, where the regular daily physical education curriculum was devoid of any of the TBPC activities, or the treatment classes, where one TBPC activity was incorporated into the regular daily physical education curriculum every second week. Questionnaire administration occurred before, midway, and after an 8-month intervention period consistent with the school year. The researchers or research assistant administered all questionnaires.

An orientation workshop was held at the beginning of the school year to familiarize the 18 teachers with the parameters of the study and the TBPC program. The first part of the workshop included an explanation of the data collection procedures including the requirements of informed consent and assent as well as administration of the questionnaires. All 18 teachers attended this portion of the workshop and did not know if they were in an intervention school or control school until after the training was completed. The second part of the workshop was designed
for the nine teachers of the intervention classes. This part included an overview of the TBPC program and a demonstration of the introductory TBPC tasks. The teachers practiced the explanation and facilitation questions for the introductory tasks during this session.

A total of 18 TBPC tasks were completed during the 8-month intervention, including four introductory tasks, eight intermediate tasks, and six advanced tasks. The tasks are designed for groups of 6–8 students. Therefore, the teacher assigned the group members before each class, although some changes were made on the day if necessary to account for absences. The intent over the intervention was that students worked with all classmates at some point. The groups were mixed by gender with boys and girls in each group. In addition, the tasks were sequenced throughout the intervention period from easiest to most difficult. The duration of the tasks in the physical education lessons varied depending on difficulty. Typically, the introductory tasks took approximately 10–15 min to complete, whereas the intermediate and advanced tasks often used the entire 45-min class period. To minimize variability of delivery between teachers, before the implementation of a new TBPC task, the teachers received a demonstration and participated in a trial run of the task. The researchers or a research assistant made twice-monthly site visits to all the intervention schools, and monthly visits to control schools to respond to questions and/or concerns, and provide general monitoring of the project.

Statistical Analysis

Self-perceptions and the various sources of perceived social regard were conceptually distinct. The correlations among these outcome measures at each measurement point (i.e., baseline, midpoint and final evaluations) were modest, with the largest coefficient found between perceived social acceptance and social regard from classmate at the middle evaluation ($r = .56$), indicating 31% of shared variability. Hence, each of the self-perceptions and social regard variables were considered as the outcome measures in separate multilevel models.

The data structure of the current study was hierarchical with four levels including 3 repeated measurements, 1,802 students, 72 classrooms, and 4 schools. Multilevel modeling was used to examine the effects of the intervention accounting for the effects of this nested structure. Analyzing microlevel (i.e., lower-level) data regardless of the effects of clustering would lead to inflation of type I error (Snijders & Bosker, 1999). Multilevel modeling instead provides accurate point estimates and standard errors, and also a test of significance for the intervention effect at the appropriate level. A macro-level fixed effect (i.e., regression coefficient) is tested by a $t$ test with $df$ of $N - q - 1$, where $N$ is the number of units/cases at the macro level and $q$ is the number of explanatory variables at the same level (Snijders & Bosker). Since the intervention was assigned to schools in this study, the intervention effect was tested at the school level with $df$ of $4 - 1 - 1$. Compared with analyses aggregating individual-level variables, multilevel modeling also prevents possible ecological fallacy (Snijders & Bosker), namely, a shift in the meaning of variables at various levels. For example, the effect of the proportion of female students at the school level (i.e., a contextual/composition effect) was conceptually different from that of being a female student at the individual level. Hence, multilevel models also allow a test of the cross-level interaction between intervention (at the school
level) and gender (at the individual level) for the current study. Because the small sample size at the school level (four schools) limited the statistical power of the analyses, the current models were only able to detect relatively large effect sizes.

The most appropriate analytical method, which used 4-level regression models (i.e., a growth model of individuals nested within classrooms and schools), was attempted using the restricted maximum likelihood estimation, but convergence of the log-likelihood values was not achieved in the iteration procedure for all of the outcome measures. Alternatively, the repeated measurements (i.e., the growth model) were removed from the 4-level models. Hence, 3-level models were used to predict the outcomes at the midpoint evaluation and those at the final evaluation in separate models, controlling for the baseline outcomes. Advantages for this method included fitting the data more flexibly without adhering to some form of linear or nonlinear patterns when limited information was available (i.e., only three repeated measurements), providing tests of significance for the midpoint evaluation, and requiring less computational power.

To examine the intervention effects and the moderating effects of gender, each of the outcome measures was predicted by the baseline measure of the outcome, gender, grade level (with Grade 6 serving as the reference group), intervention effect and the interaction between intervention and gender in 3-level regression models. Grade level was entered as a covariate to control for any grade-related differences given developmental patterns were not a focus of this investigation. The outcome measures included six subscales of self-perceptions and four subscales of perceived social regard. Hence, 20 models (2 evaluation periods × 10 subscales) in total were analyzed. The Holm–Bonferroni correction was used (Holm, 1979) to take into account the multiple significance tests across the 10 dependent variables. Cohen’s $f^2$ (Cohen, 1988) was used as the measure of effect size for the total intervention effects (i.e., including the intervention main effect and the interaction between intervention and gender). It was computed by \( (R_{AB}^2 - R_A^2)/(1 - R_{AB}^2) \), where \( R_{AB}^2 \) was the total variance explained for the full model and \( R_A^2 \) was the total variance explained for the model without the intervention main effect and the interaction. An $f^2$ of .02, .15, .35, .50 is considered small, medium, large, and very large in effect size, respectively.

**Results**

The Cronbach (1951) alpha reliability coefficients of the subscales at each time point and the raw mean scores (i.e., aggregating all individual scores regardless of the clustering) of the subscales at the three measurement occasions are presented in Table 1. Empty models (i.e., multilevel model with no predictor variables) were analyzed for decomposing the components of variances of the outcome measures at the student, classroom, and school levels. At the midpoint evaluation, 0–1% of the total variances were attributed to classrooms, whereas 0–4% of the total variances were attributed to schools across the outcome measures. At the final evaluation, classroom variability accounted for 0–8% of the total variances, while school variability accounted for 0–40% of the total variances across the outcome measures.

A greater variance attributed to the classroom level over time indicated that students in the same classrooms were more similar in terms of the outcome measures than students in different classrooms; likewise for variances attributed to the school.
Table 1  Means and Standard Deviations for the Control (n = 893) and Experimental (Expt.; n = 909) Groups at the Individual Level

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>Middle Evaluation</th>
<th>Final Evaluation</th>
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<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
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<tr>
<td><strong>Self-Perception</strong></td>
<td></td>
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<tr>
<td>Global Self-Worth</td>
<td>2.83</td>
<td>.43</td>
<td>2.85</td>
</tr>
<tr>
<td>Scholastic Competence</td>
<td>2.38</td>
<td>.52</td>
<td>2.31</td>
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<tr>
<td>Social Acceptance</td>
<td>2.84</td>
<td>.40</td>
<td>2.83</td>
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<tr>
<td>Athletic Competence</td>
<td>2.29</td>
<td>.51</td>
<td>2.34</td>
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<tr>
<td>Physical Appearance</td>
<td>2.31</td>
<td>.48</td>
<td>2.28</td>
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<tr>
<td>Behavioral Conduct</td>
<td>2.78</td>
<td>.45</td>
<td>2.77</td>
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<tr>
<td><strong>Perceived Social Regard</strong></td>
<td></td>
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<tr>
<td>Parent</td>
<td>2.35</td>
<td>.59</td>
<td>2.37</td>
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<tr>
<td>Classmate</td>
<td>2.67</td>
<td>.36</td>
<td>2.65</td>
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<tr>
<td>Teacher</td>
<td>2.27</td>
<td>.32</td>
<td>2.26</td>
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<tr>
<td>Friend</td>
<td>2.91</td>
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Note: α values for Cronbach’s alpha are not shown.
level. Over the course of the school year, students afforded the same environment might become more similar. In addition, students in the experimental condition were expected to have a greater change in the outcome measures. Hence, classroom and school membership should contribute to the variances of the outcome variables if the program is effective. Across the course of the intervention, the major differences in the outcome measures were expected to be a function of the experimental versus control conditions at the school level and, indeed, the variances explained at the school level were more substantial compared with those at the classroom level.

At the midpoint evaluation, students in the experimental condition showed higher levels than students in the control condition on perceived athletic competence (unstandardized $\beta = .16, p < .05$) and perceived social regard from friends ($\beta = .07, p < .05$), with small effect sizes for the total intervention effects ($f^2 = .09$ and .02). These differences, however, were not statistically significant after the Holm–Bonferroni (Holm, 1979) correction. At the end of the program, students in the experimental condition showed significantly higher levels than students in the control condition on 7 of the 10 subscales including global self-worth ($\beta = .42, p < .01$), perceived scholastic competence ($\beta = .25, p < .05$), perceived social acceptance ($\beta = .27, p < .01$), perceived athletic competence ($\beta = .59, p < .01$), and perceived behavioral conduct ($\beta = .27, p < .01$), as well as perceived social regard from classmates ($\beta = .45, p < .01$) and friends ($\beta = .39, p < .01$). Perceived scholastic competence became nonsignificant after the Holm–Bonferroni correction. The effect sizes for the total intervention effects of all the significant outcomes were medium to very large (ranging from .31 to 1.07). Of note, with regard to some perspective regarding the magnitude of these effect sizes, are the three largest effects for global self-worth ($f^2 = .56$), perceived athletic competence ($f^2 = 1.07$), and perceived social regard from classmates ($f^2 = .83$), respectively.

Significant gender-by-condition effects were found for perceived athletic competence ($\beta = -.10, p < .01$), perceived physical appearance ($\beta = .06, p < .01$), and perceived behavioral conduct ($\beta = .11, p < .01$) at the final evaluation. Results showed that the intervention was more beneficial to male students in terms of perceived athletic competence, while it was more beneficial to female students regarding perceived physical appearance and perceived behavioral conduct. Perceived physical appearance, however, became nonsignificant after the Holm–Bonferroni correction. The estimated coefficients of these models are presented in Table 2.

**Discussion**

The results of this study affirm the effectiveness of the TBPC program. The program was shown to enhance the self-perceptions and perceived social regard of middle school physical education students. This investigation adds to the mounting evidence that physical education classes incorporating the TBPC program promote positive psychological outcomes by using a multilevel approach, in which the program effects were tested and the results can be generalized at the most appropriate level. This study design and the analytical approach resolved the issues of earlier investigations regarding within-school intervention contamination and the appropriateness of the level of analysis. The TBPC program offers a commercially available curriculum that is accessible to and affordable for teachers. Moreover, the
TBPC program can be integrated with an existing curriculum, provides a movement experience compatible with established physical education standards of proficiency, and requires relatively little by way of time and equipment. We conclude that the program is effective and can effectively be implemented in real-world settings.

The first stated hypothesis was supported in that students exposed to the TBPC program recorded higher self-perceptions compared with students in the control condition. The largest effect following the intervention was observed with perceived athletic competence. A key facet of the TBPC program, which characterizes outdoor education programs as was noted by Hattie et al. (1997), is the concept of challenge. Logically, successful mastery attempts at challenging tasks would be expected to increase perceptions of competence as is consistent with the skill-development hypothesis (Marsh, 1986). The finding that perceived competence can be increased as a function of the TBPC program is promising in light of the studies conducted with physical education students that have found perceived competence to predict outcome variables such as effort exerted in physical education, intention to exercise, and leisure-time physical activity (Taylor, Ntoumanis, Standage, & Spray, 2010) as well as interest/enjoyment in physical education and participation in after-school physical activity (Ommundsen & Kvalø, 2007).

A very large effect was also observed following the intervention with global self-worth. Of course, the mechanism for change remains unknown in that it is unclear whether this more general construct changed as a function of increases in the domain-specific self-perceptions such as perceived athletic competence and/or perceptions of social regard. Harter’s (1987) mediational model of self-worth depicts self-perceptions in domains deemed to be important and perceived social regard as the antecedents to improving global self-worth. Future research could explore if indeed the impact of the TBPC program on global self-worth is indirect via the proposed antecedent variables and/or a direct influence. What is most salient from the current findings, given the effect of self-worth on affect and motivated behavior as specified in the model, is that the global self-worth of children can be enhanced.

An unexpected yet reported improvement in self-perceptions concerned perceived behavioral conduct. The TBPC program has sometimes been associated with improvements in perceived behavioral conduct with female (Ebbeck & Gibbons, 1998) and male (Gibbons & Ebbeck, in press) students. The large effect of the program at increasing perceived behavioral conduct could likely be attributed to the emphasis in the TBPC program on following rules or encountering sacrifices, where students subsequently reported they felt they were better at acting the way they are supposed to act and knowing what they should do. Such a finding does
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<th>PSR</th>
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**Note.** GSW = global self-worth; SCC = scholastic competence; SOC = social acceptance; ATH = athletic competence; APP = physical appearance; CON = behavioral conduct; PSR = parent social regard; CSR = classmate social regard; TSR = teacher social regard; FSR = friend social regard. Variance components are presented in four decimal points for higher accuracy. One-tailed tests were used for variance components, as they can be only positive numbers. Gender was binary coded as 1 (female) and 0 (male), and condition was binary coded as 1 (experimental) and 0 (control). *p < .05, **p < .01, ***p < .001.

*Cohen’s $f^2$ was computed by $(R_{AB}^2 - R_A^2)/(1 - R_{AB}^2)$, where $R_{AB}^2$ was the total variance explained for the full model and $R_A^2$ was the total variance explained for the model without the condition effect and the interaction effect between condition and gender. *Condition and condition-by-gender effects were statistically significant at an alpha level of .05 after Holm–Bonferroni correction (Holm, 1979) across the 10 dependent variables.*
highlight the potential merits of utilizing the TBPC program to positively impact behavioral outcomes such as bullying behaviors, which aligns with efforts to use experiential, adventure-based “anti-bullying initiatives” in the schools (Beightol, Jevertson, Gray, Carter, & Gass, 2009).

The results of the present investigation also supported the hypothesis that students in the intervention classes would record higher perceptions of positive regard from classmates than their counterparts in the control groups. An exciting discovery of this project was the finding that the impact of the TBPC program extends beyond self-perceptions alone. At the end of the intervention, a very large effect was observed with students in the treatment groups reporting significantly higher scores than students in the control groups on perceived social regard from classmates. As a result of the intervention, students were more likely to respond positively to questionnaire items concerned with having classmates who pay attention to what they say, having classmates they could become friendly with, and having classmates who like them the way they are. This finding is likely a testimony to those aspects of the TBPC program that emphasize positive team encouragement (giving praise, using first names, describing peers positively) as well as de-emphasize negative pressure and put-downs.

Our finding that the TBPC program enhanced perceptions of positive regard from classmates adds to the studies conducted in the physical education setting that focus on peers and social dynamics. For example, Goudas and Magotsiou (2009) reported on the impact of a cooperative program that integrated the themes of interacting with peers, solving problems cooperatively, helping peers and receiving help for goal accomplishment, meeting personal goals through cooperative play, and following or leading a group depending on the circumstances. They found that the cooperative program, in contrast to a control condition, improved the social skills of students by increasing cooperating skills and empathy as well as decreasing quick-temperedness and disruptiveness. Moreover, Cox, Duncheon, and McDavid (2009) reported that peers acceptance and friendship quality were associated with feelings of relatedness that were, in turn, associated with the amount of enjoyment and worry experienced by physical education students. If, as the literature suggests, support from peers is associated with involvement in sport activity (Patrick et al., 1999), commitment to scholarly goals (Wentzel, 1998), and fewer behavioral problems (DuBois et al., 2002), then a curriculum involving the TBPC program could provide one mechanism for indirectly advancing these desirable outcomes by effectively increasing students’ perceived positive regard from classmates.

Students in the treatment as opposed to control groups reported significantly higher scores on perceived positive regard from friends by the end of the intervention. This effect was large and unexpected. We anticipated any benefits of the TBPC program would be contained to those involved with the program. Of course, students in responding to the questionnaires might not make a distinction between classmates and friends. Questionnaire items that refer to close friends who you can tell your problems to, care about your feelings, and listen to what you say do not necessarily exclude classmates. Conversely, students through the TBPC program learn to respect others and communicate in a positive fashion that they, in turn, might convey and encourage in their interactions with friends outside of physical education classes.
At the end of the intervention, students in the treatment and control groups, contrary to our hypothesis, recorded similar scores on perceived positive regard from teachers. This finding reflects students across conditions responding similarly to items stating that teachers help them if they are upset, help them do their very best, care about them, and care if they feel bad. In hindsight this finding might be consistent with the notion of teachers serving to merely facilitate and not direct the TBPC activities, which could propel peers into a more central role over teachers with regard to the social dynamics. Consistent with this finding, Schmakel (2008) reported that students found group work “to increase understanding or interest in particular lessons or subjects, improve learning, and at the same time satisfy seventh graders’ needs for social interaction” (p. 737). It is unclear with the present investigation the extent to which students responded to the items assessing perceived social regard from teachers thinking only in reference to physical education teachers versus school teachers in general. This is an area that warrants future research as the potential value for children of perceived teacher support is noteworthy. As recognized by Harter (1999), for some students the positive regard from teachers might not simply add to other sources of social support but rather balance the possible absence of support from parents.

In addition to perceived positive regard from teachers, there were other variables that did not change as a function of the intervention. Subscale scores were comparable across the treatment and control conditions at the end of the study for perceived scholastic competence, perceived physical appearance, and perceived positive regard from parents. Improvement in perceived scholastic competence was hypothesized for students in the intervention classes as this variable had been responsive to the TBPC program in earlier studies (Ebbeck & Gibbons, 1998; Gibbons & Black, 1997; Gibbons & Ebbeck, in press) and, indeed, again in this study students in the intervention classes were higher on perceived scholastic competence, although the difference was not statistically significant after the Holm-Bonferroni (Holm, 1979) correction. Arguably we can have greater confidence that the reported findings of this study were not simply an artifact of the methodology employed when only those subscales most logically related to the TBPC program were impacted by the intervention. That is, seeing no change in variables such as perceived parent regard that were not expected to change as a function of the intervention lends credence to the idea that the observed changes were indeed a result of the intervention program.

An extension in the design of this study over earlier investigations examining the TBPC program was the collection of data at midintervention as well as at postintervention. The variables used in this study to determine program effectiveness did not differentiate students in the treatment and control groups by midintervention. It was at the end of the 8-month intervention that large effects were observed. A practical implication from this finding is that practitioners would be well advised to implement the full array of TBPC activities offered in this study. Additional research is required, however, to fully understand the exposure-response relationship. Was the greater effect from mid- to postintervention simply a function of more exposure to the program? Glover and Midura (1992) speak to the fact that as team members “become more relaxed and self-confident, they also become more open to making group decisions rather than having one person decide for them” (p. 4). This is indicative of how comfort levels and processes change with time that might
explain the greater effect of the program over an extended period. Alternatively, the content of the program might play a role knowing the tasks in the first half of the intervention period were less challenging than tasks in the second half of the intervention period. Another consideration yet unexplored is whether comparable effects would be recorded if the same amount of exposure provided in the current investigation (18 tasks) were experienced in a condensed and more intense format. Clearly what would also be beneficial in future research is to determine the extent to which the positive effects of the program remain after exposure to the program is removed.

A secondary interest of the current investigation was to examine any differences in responsiveness to the TBPC program based on gender. While all students have benefited from the TBPC program in earlier studies, an advantage for female students has been reported in both coeducational (Ebbeck & Gibbons, 1998) and gender-segregated (Gibbons & Ebbeck, in press) classes. The results of this study in essence advanced the notion that all students, irrespective of gender, benefited from the program. Our hypothesis that female students would benefit more from the program than male students was evident, to any meaningful degree, with only the single outcome variable of perceived behavioral conduct. The one instance where males benefited more than females was with regard to perceived athletic competence. Knowing that both male and female students profit from exposure to the TBPC program is reason to ensure that all students are provided the opportunity to participate in and gain from the program.

Physical education has the potential to positively impact the lives of children. Physical education can certainly help the physical development of youth and has been earmarked as a key part of the solution to prevent health problems such as childhood obesity (Pekruhn, 2009). The current investigation suggests that physical education can also provide a context for the psychological development of students. This study assessed the effectiveness of the TBPC program in a field setting. The indicators of program effectiveness were derived from a conceptual framework and assessed with measures consistent with assumptions regarding the conceptual framework. The findings demonstrated that the TBPC program enhanced the self-perceptions and perceived social regard of male and female middle school students. Researchers and educators both could benefit from the insights gleaned as a function of this investigation.

References


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