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Effects of a developmental adventure on the self-esteem of college students

Authors: Linda Paquette, Audrey Brassard, Audrey Guérin, Justine Fortin-Chevalier,
Laurence Tanguay-Beaudoin.

Authors affiliation :

Université du Québec à Chicoutimi, assistant professor of psychology (Linda Paquette, Ph.D.

linda_paquette@uqac.ca) ;

Université de Sherbrooke, professor of psychology (Audrey Brassard, Ph.D.

Audrey.Brassard2@USherbrooke.ca) ;

Université du Québec en Outaouais, grad student (Audrey Guérin, BA,

chapslauren@hotmail.com) ;

Université Laval, grad student, (Justine Fortin-Chevalier, BA, justine.chevalier@gmail.com) ;

Université de Montréal, grad student (Laurence Tanguay-Beaudoin, BA,

laurence.tanguay.beaudoin@umontreal.ca)

Corresponding author :

Linda Paquette, Ph.D.

Département des sciences de la santé, Université du Québec à Chicoutimi, 555 boul. Université,

Chicoutimi, Québec, Canada, G7H 2B1, linda_paquette@uqac.ca, 1-418-545-5011 ext. 5265

Abstract

This study examines the effects of outdoor developmental adventure programming (ODA) on college students' self-esteem. Although some previous studies have shown that outdoor adventure programming has positive effects on self-esteem (e.g., Kolb, 1988), others did not find any effect (e.g., Sheard & Golby, 2006). A quasi-experimental study was conducted over five months, which included two pre-tests and two post-tests in order to address some limitations of previous studies. A total of 84 participants completed the *Questionnaire d'estime de soi hiérarchique*, a questionnaire assessing self-esteem (Beaudoin, Guérin, Fortin-Chevalier, & Brassard, 2010) on four occasions. The experimental group (outdoor adventure; $n = 32$) was compared with the control groups (travel, $n = 17$; soccer, $n = 35$) using repeated measures of covariance analyses. Positive and significant increases were found for the athletic dimension of self-esteem and for global self-esteem for the experimental group (outdoor adventure) only. The increased benefits provided by the combination of adventure and sports in ODA, over sports only or travelling only interventions, underline the importance of developing ODA with college students.

Key words: Adventure programming, self-esteem, quasi-experimental design, youth development.

Effects of an outdoor developmental adventure on the self-esteem of college students

In Quebec, the number of organizations providing developmental outdoor interventions with young adults is increasing (Aventure Écouterisme Québec Inc., 2008). However, no study has yet been conducted to scientifically demonstrate the effectiveness of this type of intervention. This study specifically focuses on outdoor developmental adventure programming (ODA), rather than other types of programs, such as educational adventures and therapeutic adventures (Miles & Priest, 1990).

An ODA is similar to a personal growth activity and is not intended exclusively for clients with physical or mental conditions (Sibthorp & Morgan, 2011). The term *outdoor* refers to where the program takes place and *adventure* indicates an uncertainty of outcome, which adds an element of challenge to the experience (Hopkins & Putnam, 1993). *Developmental* means that the principal aim involves personal growth, which is facilitated by the program (Rickinson et al., 2004). Outdoor developmental adventure necessitates frequent and intense interactions, such as group problem solving and decision making. Qualified instructors accompany a group, and the program length varies between two and four weeks (Hattie, Marsh, Neill, & Richards, 1997). Participants leave their everyday life to take part in various outdoor activities such as canoeing, climbing and hiking (Miles & Priest, 1990; Rickinson et al., 2004). In addition to the physical challenges, participants are asked to face social, mental and emotional challenges through the teamwork and group activities (Kimbrough, 2007). The multi-dimensional nature of the challenges in an ODA creates a microcosm favorable for the optimal biological, psychological and social development of youth (Sibthorp & Morgan, 2011).

Overall benefits of outdoor developmental adventures

The meta-analysis by Hattie et al. (1997) evaluated the magnitude of the effect of different ODA programs on a set of variables (e.g., leadership, self-concept, personality, academic

achievement, interpersonal relationships) by comparing the differences between the pre-tests and the post-tests carried out at different times. According to this meta-analysis, ODA can elicit reduced aggression, greater emotional stability, improved personal motivation, an increase in maturity, social skills, and a transition from an external to an internal locus of control.

A second meta-analysis by Cason and Gillis (1994) selected 43 studies. For the 11,238 adolescents surveyed who had completed a three-week program on average, the main benefits of ODA were the transition to an internal locus of control, reduced depression and anxiety, and improved self-esteem. Finally, Neill and Richards (1998) summarized three meta-analyses and concluded, by studying more than 12,000 participants, that ODA has a positive effect that ranges from small to medium on the transition to an internal locus of control, self-confidence and self-concept. The authors also noted the lack of research on the medium-term effects of ODA, and reiterated the importance of follow-up studies.

Developmental adventure and self-esteem

When taking part in an ODA program, one intention is for participants to discover that they can take on major challenges (Hopkins & Putnam, 1993). This could promote their global self-esteem (Bertolami, 1982). By engaging in sports activities, participants develop specific outdoor skills that they can then apply to other areas of their lives (Sibthorp & Morgan, 2011). It has been argued that ODA is particularly relevant to youth, as they experience significant fluctuations in their self-esteem (Baldwin & Hoffman, 2002).

To date, a number of studies have focused specifically on the effects of ODA on self-esteem, although within these there have been ‘unsubstantiated claims’ that outdoor learning will raise self-esteem (see Leather, 2012, p. 13). The results of these studies are contradictory and possibly influenced not only by the intervention model chosen, but also by the way that self-esteem was evaluated and conceptualized.

Uni-dimensional definition of self-esteem. Self-esteem refers to the positive or negative evaluation (Rosenberg, 1965) of perceptions that a person has about themselves or a value judgment about oneself (Branden, 2001). In early studies on self-esteem, the uni-dimensional concept of self-esteem served as an overall barometer of the assessment that individuals made of themselves. The Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965) is one of the most frequently used tools to measure the overall perception of participants of their own value. Its excellent psychometric qualities support its use in research. Several studies have evaluated the effect of ODA on global self-esteem, with mixed results.

Sheard and Golby (2006) conducted a study with English college students aged between 16 and 39 years. The experimental group ($n = 26$) were students on a two-year Outdoor Adventure Education (OAE) foundation degree course. During the three month period of research, this course included physical activity (e.g., canoeing, hiking) and learning to teach these activities. The control group ($n = 26$) was drawn from a tourist and travel degree course, which received readings and practical assignments in connection with tourism and travel. Analyses showed no significant improvement in self-esteem among participants in the experimental group when compared with the control group. However, the longer duration of the program is not representative of an 'ideal' ODA, which favors a rather intensive period of two to four weeks (Hattie et al., 1997).

A second study involving 265 participants aged between 12 and 22 years showed no effect of ODA on global self-esteem (Kaly & Heesacker, 2003). The adventure was over a three-week period and involved discussions and sports (e.g., snorkeling, climbing). The pre-test was held on the first day of the adventure and the post-test was held on the last day of the adventure for the experimental group. The control group took only the pre-test and a second experimental group took only the post-test to avoid a bias due to the first administration of questionnaires. Analyses

of the data revealed no effect of ODA on self-esteem. The absence of a post-test in the control group and long-term monitoring, however, limits the conclusions of the study.

Another study was conducted among youth aged 17 to 28 years participating in a 26-day Outward Bound program (Bertolami, 1982). A quasi-experimental design was used and the differences between the pre-test (first day of the program) and the post-test (last day of the program) show a significantly greater increase in global self-esteem (RSE; Rosenberg, 1965) for the experimental group ($n = 19$) when compared with the control group ($n = 26$). Complementary qualitative interviews showed the same effect. It is possible that anxiety bias and euphoria bias affected the results of this study. Anxiety bias is the presence of anxiety in participants just before starting a program (Propst & Koesler, 1998). It justifies the need for a measurement some time before the start of a program (Hattie et al., 1997).

Many concerns have been raised regarding the conceptualization and uni-dimensional measure of self-esteem (Butler & Gasson, 2005; Emler, 2001; Kristjánsson, 2007; Leather, 2012). The RSE, for example, cannot measure the effect of adventure on the specific dimensions of self-esteem, and thus remains a subjective and somewhat vague indicator of global self-worth. According to Kristjánsson (2007) and Leather (2012), more precise or *domain-specific* self-esteem should be assessed to accurately describe the effects of ODA on distinct areas of the self.

Multidimensional self-esteem. To address these limitations, hierarchical models have been developed to assess different dimensions of self-esteem, and enable a more complete conceptualization of this concept. To our knowledge, only the study by Kolb (1988) has shown the effect of ODA on multidimensional self-esteem, by considering global, physical, social and emotional self-esteem. Participants in the experimental group were enrolled in the Discovery Program, which is a ten week-long, ninth grade mandatory course that includes three intensive expedition days per week. The control group consisted of students enrolled in another course that

was chosen randomly. Multivariate analyses showed a significant improvement in the four dimensions of self-esteem between the pre-test (done during the first week of the program) and the post-test (conducted two weeks after the end of the program) in the experimental group ($n = 41$). This improvement was significantly higher than the control group ($n = 46$).

Until recently, self-esteem questionnaires have focused primarily on populations of children, adolescents and adults, while paying less attention to those aged between 17 and 25 years. In order to address this problem, Beaudoin, Guérin, Fortin-Chevalier, and Brassard (2010) developed a hierarchical model questionnaire specifically designed for adolescents and young adults, which was inspired by the work of Fox (1988) and Harter (1986). In the questionnaire, global self-esteem, which comprises the assessment of underlying and distinct dimensions, is at the top of the hierarchy. This approach allows both the uni-dimensionality of global self-esteem to be preserved and for certain dimensions (social, athletic, appearance) to be explored more specifically within a hierarchical structure (Fortes, 2003).

Research Objectives

This study aims to measure the effects of ODA on the multidimensional self-esteem of college students. Taking into account the limitations of previous studies, two hypotheses were formulated. The first hypothesis concerns the short-term effect of ODA and proposes a significant increase in the three self-esteem dimensions (athletic, social, appearance) and the global score between the beginning and the end of the ODA for the experimental group only. The second hypothesis concerns preserving the ODA benefits over the medium term and requires an improvement in both the dimensions of self-esteem (athletic, social skills, appearance) and the global score for the experimental group only (between the assessment two weeks before the program and the assessment two months after the end of the program).

Method

Participants

To isolate the effects of the ODA program, the sample consisted of three groups: an experimental group and two control groups. The experimental group (group 1: outdoor) consisted of 32 college students aged between 17 and 22 years ($M = 17.86$; $SD = 1.01$). They were enrolled on a voluntary basis on an 18-day outdoor education course, which took place in June 2008. The course explored the surrounding area (lakes, forests, mountains, etc...) by bike, on foot, by canoe, and by kayak for the entire period. Participants tried rock climbing and snorkeling, and stayed alone for two days on an island. Each sub-group had to set up their camp, prepare meals, and maintain their expedition equipment. The composition of the sub-groups was regularly changed. Facilitators (professional guides and former students) and teachers (with biology and physical education specialisms) helped participants learn various outdoor skills. Diverse discussions about geography, geology, climatology, and environment were also part of the program. The course content corresponded with the definition of ODA outlined earlier.

Two control groups were selected to distinguish two aspects of ODA: social relationships and physical activity. The first control group (group 2: travel) aimed to isolate the “social” dimension of ODA. It consisted of 17 college students aged between 17 and 21 years ($M = 18.33$; $SD = 1.18$) who were participating on a voluntary basis in a three-week international cooperation project in South America. The second control group (group 3: soccer) aimed to isolate the “physical activity” dimension of the adventure. It consisted of 35 young people aged between 14 and 18 years ($M = 16.49$; $SD = 0.78$) who belonged to two soccer teams (female and male). The teams met two to three times a week from March until the end of the summer.

Academically, 69.6% of participants were in college while 30.4% attended secondary school. Regarding the age of participants, the soccer group was significantly younger than the other groups, $F(2,75) = 26.57$ $p < 0.001$. There was also a significant difference in the sex of

participants between the travel group (14 women, 1 man) and the other two groups (outdoor: 14 women, 14 men; soccer: 18 women, 17 men; $\chi^2(2, N = 78) = 9.075, p < 0.05$). Participants in the travel group reported significantly less physical activity in general than the other two groups, $F(2, 75) = 17.81, p < 0.001$.

Research design and instruments

A quasi-experimental design with nonequivalent control groups was used. Participants in all three groups were asked to complete two questionnaires on four occasions, in order to take into account anxiety bias and euphoria bias. The time needed to complete a questionnaire was about 20 minutes. Time 1 (pre-test 1) took place two months before the start of the program, time 2 (pre-test 2) took place two weeks before the start of the program, time 3 (post-test 1) took place the same day as the end of the program, and time 4 (post-test 2) took place two months after the end of the program. For all groups (experimental and control), questionnaires were administered at the same time of the year (April, May, June, and August 2008).

A brief socio-demographic questionnaire was used to gather information on sex, age, education level, and place of residence of the participants. The degree of physical activity in general was also part of the brief questionnaire.

The hierarchical self-esteem questionnaire (QESH; *Questionnaire d'estime de soi hiérarchique*; Beaudoin et al., 2010) consists of 27 items assessing three dimensions of esteem, which are athletic (e.g., "I think I succeed very well in the majority of sports"), social (e.g., "I often feel embarrassed"), and appearance (e.g., "I am happy with my appearance"). Together, these dimensions form a score of global self-esteem, since the QESH is based on a hierarchical conceptualization of self-esteem. Factor analysis supports the three-factor structure. Items were measured on a 4-point Likert scale ranging from (1) "strongly disagree" to (4) "strongly disagree". The QESH has adequate internal consistency (α varying between 0.84 and 0.91). In the

present sample, internal consistency of the four measurement times is adequate for the global (α ranging from 0.91 to 0.94), athletic (α ranging from 0.89 to 0.93), social (α ranging from 0.83 to 0.88) and appearance (α ranging from 0.82 to 0.91) esteem scales. The QESH also has good test-retest stability over time, and was evaluated over a period of two weeks (r s ranging from 0.89 to 0.93). In addition, it has good convergent validity with RSE (Beaudoin et al., 2010).

Results

Preliminary analyses

Preliminary analyses showed the presence of a moderate negative correlation between age and the athletic dimension of self-esteem, $r(82) = -0.312, p < 0.01$. This variable was therefore the subject of a statistical control in subsequent analyses involving the athletic dimension of self-esteem. *T*-tests for independent groups also showed gender differences for the athletic, $t(76) = 3.69, p < 0.001$, social, $t(76) = 2.43, p < 0.05$, and appearance, $t(76) = 4.37, p < 0.001$ self-esteem dimensions, as well as for global self-esteem $t(76) = 4.58, p < 0.001$. Indeed, average scores for women were significantly lower than those for men for the athletic (women: $M = 2.62$; men: $M = 3.13$), social (women: $M = 2.80$; men: $M = 3.10$), and appearance (women: $M = 2.69$; men: $M = 3.19$) self-esteem dimensions, as well as for global self-esteem (women: $M = 2.70$; men: $M = 3.46$). This variable was statistically controlled in subsequent analyses.

Analyses of variance were conducted to verify the equivalence of groups on the self-esteem dimensions at time 1. The results showed a significant difference between the groups for athletic, $F(2,75) = 14.29, p < 0.001$, appearance, $F(2,75) = 5.63, p < 0.01$, and global, $F(2,75) = 6.66, p < 0.01$, self-esteem. For the athletic dimension, the travel group ($M = 2.16$) had a significantly lower average score than the outdoor ($M = 2.90$) and soccer ($M = 3.07$) groups. Regarding the appearance dimension, the outdoor group ($M = 3.15$) reported significantly higher scores than the travel ($M = 2.72$) and soccer ($M = 2.76$) groups. The travel group ($M = 2.55$) had an average global

self-esteem that was significantly lower than the outdoor ($M=3.05$) and soccer ($M=2.89$) groups. These results support the necessity of using time 1 scores as covariables in the subsequent analyses to offset these differences.

To ensure that the loss of participants in the post-tests did not overly bias the results, a multivariate analysis of variance (MANOVA) was conducted on scores from the first measurement time. This analysis compared the participants who responded in the four sessions and those who missed one or more sessions. The results show no significant difference related to scores of self-esteem, $F(2,74) = 2.69, n.s.$ Thus, the loss of participants between the various sessions does not appear to be due to a difference in the initial scores of self-esteem.

Hypothesis testing

Analyses of covariance with repeated measures were performed by controlling the following variables measured at time 1: initial score (athletic and appearance self-esteem dimensions, global self-esteem), age (athletic dimension of esteem) and sex (all scores of self-esteem). These analyses were used to verify the effects of ODA on self-esteem as a function of the group (controls vs. experimental), the time when the questionnaire was administered (time 2, time 3, time 4), and the interaction effect between the group and the time. Two sets of analyses were conducted to address the hypotheses. The first set considers only times 2 and 3, while the second set includes times 2 and 4. Assumptions of normality, homogeneity of variance, and homogeneity of the variance and covariance matrix were met in the analyses.

Regarding hypothesis 1, the results show a significant group X time interaction effect (see Table 1) for the athletic self-esteem dimension. This interaction explains 35.0% of the self-esteem variance related to the athletic dimension. Analyses of simple effects show that the effect of time is significant only for the outdoor group participants, $F(1,62) = 50.10, p < 0.001, d = 0.66$. The average for this group increases between the beginning of the outdoor activity and the return

from the activity. There is no significant difference for the travel, $F(1,62) = 1.40$, n.s., or soccer, $F(1,62) = 0.13$, n.s., groups. Thus, only the outdoor group participants increased the element of their self-esteem that was related to the athletic dimension.

[Insert Table 1 here]

For global self-esteem, the results also show a significant group X time interaction, which explains 18.7% of the variance in global self-esteem. Analyses of simple effects show that the effect of time is significant only in the outdoor group, $F(1,62) = 28.36$, $p < 0.001$, $d = 0.53$. Again, the average for this group increased after the 18-day outdoor education course. The difference is not significant for the travel group, $F(1,62) = 0.09$, n.s., or soccer group, $F(1,62) = 0.99$, n.s. Thus, global self-esteem improved only in the outdoor group.

As for the social and appearance dimensions of self-esteem, the analyses indicate that there is no significant group X time interaction effect. These results partially support the first hypothesis by showing an increase in the athletic dimension of self-esteem, and an increase in global self-esteem between time 2 (two weeks before the program) and time 3 (immediately after the program), for the outdoor group participants only.

Table 2 presents the results of a second set of analyses, which takes into account the fourth measurement period. These analyses were used to test hypothesis 2, which concerns the persistence of benefits over the medium term. For the athletic dimension, the results show that there is a significant group X time interaction effect, which accounts for 22% of the variance of the athletic dimension. Analyses of simple effects revealed that the effect of time occurs only for participants in the outdoor group, $F(1,42) = 17.27$, $p < 0.001$, $d = 0.43$. In fact, the average for this group increases significantly between two weeks before the 18-day outdoor experiential course (time 2) and two months after the end of the activity (time 4). There is no significant change for the travel group, $F(1,42) = 0.28$, n.s., or soccer group, $F(1,42) = 0.11$, n.s.

[Insert Table 2 here]

Regarding the social dimension, the results show that there is a significant group X time interaction effect (27.9% of variance explained). Analyses of simple effects show that the effect of time is significant only in participants of the soccer group, $F(1,42) = 4.21, p < 0.05, d = 0.46$. However, the average for this group actually decreases significantly between times 2 and 4. No change is significant for the outdoor group, $F(1,42) = 1.18, n.s.$, or travel group $F(1,42) = 0.08, n.s.$

The results show a significant group X time interaction effect for global self-esteem, which explains 33.0% of the variance. Analyses of simple effects indicate that the effect of time occurs only in the outdoor group, $F(1,42) = 13.43, p < 0.01, d = 0.37$. In fact, the average for this group increases significantly between time 2 and time 4. Differences are not significant for the travel group, $F(1,42) = 0.51, n.s.$, or soccer group $F(1,42) = 0.97, n.s.$

As for the appearance dimension, the analyses indicate no significant group X time interaction effect between times 2 and 4. These results partially support the second hypothesis. They show the persistence of the significant increase in the athletic dimension and global self-esteem between the assessment at time 2 (two weeks before the beginning of the program) and the assessment at time 4 (two months after the end of the program), for those who participated in the 18-day outdoor education course only.

Discussion

The results show that participants in the outdoor group had their global and athletic self-esteem increase after the experience and two months later, unlike the other two groups. Overall, several factors could explain the changes in the experimental group. First, participants in the 18-day outdoor education course experienced a transitional period between adolescence and adulthood called “emerging adults” (Arnett, 2000). The period between 18 and 25 years is

marked by the exploration of various possible directions (e.g., visions of life) as well as many changes. According to Martin and Smyer (1990), several major life events occur during this period. Thus, it is possible that the participants, who were emerging adults, were particularly willing to immerse themselves in the adventure, make the most of the experience, and come away with some positive changes.

Compared to the activity itself, the relationships that form between facilitators and participants are important and can positively influence the effects of the adventure (McKenzie, 2003). It is possible that the facilitators supported the participants throughout the adventure in such a way that the emerging adults developed the confidence necessary to change their perceptions of themselves. However, this study did not specifically examine the effects of this relationship on self-esteem.

In addition, the perception of a challenge, offset by a sense of security, is an important requirement to enable positive changes in participants (Hopkins & Putnam, 1993). Indeed, the notion of challenge and uncertainty was present during the 18-day outdoor education course because participants had no control over the weather and had to constantly adapt to new situations. As all activities were supervised in order to minimize the risk of accidents, it is possible that participants' perceptions of the likelihood of being harmed were offset by a feeling of security throughout the activity. However, it would be relevant in a future study to verify the subjective experience of participants concerning their perception of risk and safety in the adventure (Davis-Berman & Berman, 2002).

This adventure offered periods of personal reflection and contemplation, especially during the two days spent alone on an island. These periods of solitude and rest provided an opportunity for participants to gain a more realistic and positive perception of the events they had experienced (Bobilya, Holman, Lindley, & McAvoy, 2010; Cason & Gillis, 1994). Such an adventure also

provided them with the possibility to develop specific skills such as leadership, problem solving and management responsibilities leading them to develop a more positive view of themselves (Kolb, 1988; Sibthorp & Morgan, 2011). All these elements may have contributed to the increase in global and athletic self-esteem.

The increase in the athletic dimension for the outdoor group agrees with the findings obtained by Kolb (1988). He showed the positive effect of ODA on the athletic dimension in an experimental group only. According to this author, it is the absence of competition among participants that causes the positive result. For this study, the results could also be explained by the ubiquity of physical activity in the 18-day outdoor education course. Indeed, throughout the course, participants were moving around as they experimented with different physical activities and learned appropriate techniques. In some activities, the level of challenge was high, and could have led participants to feel proud of what they had accomplished. Regarding the benefits in the medium term, it is possible that the participants, having evaluated more positively their athletic skills immediately after the adventure, would be motivated to pursue some outdoor activities during the summer and retain this positive assessment. According to Wilson and Lipsey (2000), programs that require participants to face many physical challenges are more effective at raising self-esteem than other programs without physical challenges and have a more lasting effect over time.

The results regarding the short-term increase in global self-esteem for the outdoor group agree with those of the study of Bertolami (1982). According to this author, by successfully facing activities that are challenging both physically and emotionally, by always exceeding their limits, and by constantly being challenged, participants develop a more positive perception of themselves. In the present study, it is also possible that the 18-day outdoor education course constituted an optimal experience, which is described by Csikszentmihalyi (2004) as producing a

deep sense of enchantment that is so intense that people are willing to invest a lot of energy to feel it again. An optimal experience would arguably have a positive influence on self-esteem, which could explain the positive effect, in the short and medium term, of the 18-day outdoor education course on participants' global self-esteem. Loss of self-consciousness would be the component of the optimal experience that reinforces self-esteem once the developmental adventure has ended. Thus, it is possible that the combination of experiences in the 18-day outdoor education course causes a loss of the sense of self as separate from the world. During this time, there would be no more self-examination, nor space for the self to feel threatened. The participants could feel this, in particular, as being in union with nature and with others. The absence of concern over themselves thus allows participants to expand their self-concept and improve the resulting evaluation (Csikszentmihalyi, 2004).

Analyses revealed no significant effect of the 18-day outdoor education course on the social dimension of self-esteem in the short and medium term. Although this result does not support our hypotheses, there are some possible explanations for this. On the one hand, notwithstanding the constant presence and support of the group, the challenges and risks mentioned above are perceived and experienced individually, and participants are confronted with themselves and their limits. On the other hand, it could be that the small sample size did not allow significant changes to be observed.

As for the reduction of the social aspect of self-esteem in the medium term for the soccer group, it is possible that the strong pressure to win leads to a competitive climate within the team during the season. Thus, players are inclined to compare themselves, which may have an adverse effect on this dimension of self-esteem.

Regarding the appearance dimension of esteem, no significant results were demonstrated. It is possible that the concept of appearance lost importance during the 18-day outdoor education

course, because the focus is more on adventure than body image. This agrees with Csikszentmihalyi's (2004) claim regarding the absence of self-examination during an optimal experience. Without diminishing the appearance self-esteem dimension, it is possible that the outdoors does not affect this dimension of esteem in the short or medium term.

Strengths and limitations

This research is the first study of its kind in Quebec with a Francophone sample. Several methodological limitations of previous studies have been considered, which is an important step in this field. First, the use of a hierarchical instrument for self-esteem has allowed a more sensitive evaluation of the specific components of self-esteem affected by ODA. Then, the research design allowed several biases to be avoided. Anxiety bias was taken into account as the second administration of the questionnaire was held two weeks before the departure of the participants, and not on the same day. By measuring the effect in the medium term, euphoria bias was also controlled. The quasi-experimental design in four periods also allowed the medium-term developmental effect of adventure programming to be evaluated. For this purpose, Miles and Priest (1990) evaluated the effectiveness of ODA by considering participants' ability to use, in their everyday lives, the skills developed during the adventure. The authors emphasized the importance of assessing the programs over the longer-term. However, the loss of participants in the current study's last evaluation did not allow a comprehensive analysis of the retention of benefits to be carried out and is a limitation.

The results showed that the groups of participants were not equivalent with respect to age, sex, and their initial self-esteem scores. The use of these covariables in the main analyses, however, helped to offset these differences. According to Garst, Shneider, and Baker (2001), it is difficult to find equivalent control groups as developmental adventures are distinguished by their duration, intensity and the different challenges (physical, mental, emotional and social) imposed

to participants. Despite the non-equivalence of groups, the two control groups are one of the strengths of this study. In fact, they allowed the two main components of ODA (social and physical) to be considered and, thus, the specific effect of the outdoors to be isolated. In this sense, the results show that the social and physical components of ODA cannot alone explain the increase in self-esteem for the outdoor group, since the two control groups did not show an increase. Other factors specific to the outdoors (e.g., relationship between facilitators and participants, the fact of being in nature, the concept of risk offset by a sense of security and personal reflections) may explain these results.

The nature of the activity constitutes a barrier to recruitment in this type of research. Indeed, in the current study, each participant chose to be involved in an adventure program, humanitarian trip or soccer team. Consequently, these samples are not representative of the general population and the generalizability of the results is therefore limited. In addition, these activities are designed for small groups, which limits the sample size. As well as the small sample size in all groups, there was a loss of participants over the course of the study, which affected the power of the statistical analyses. A higher number of participants would allow more subtle changes in self-esteem to be detected. While the loss of participants did not preclude us from finding significant results in the study, it remains appropriate to advise future researchers to be vigilant about maintaining a high level of participation, especially when evaluating longer-term effects of ODA.

Implications

Positive effects on global and athletic self-esteem demonstrated by this study, especially in the medium term, confirm the effect of ODA on the lives of participants. Indeed, the importance of healthy self-esteem is well established. According to VandenBos (2007), a reasonable degree or high self-esteem is considered an important factor in mental health. In addition, high self-

esteem is an important predictor of life satisfaction (Diener & Diener, 1995), social support (Ornish, 1998), and of appropriate responses to stressful life situations (Murrell, Meeks, & Walker, 1991). These encouraging results could prompt other colleges to develop similar programs to the benefit of their students.

For future research, it might be worthwhile to add a qualitative component to the study. This would increase our knowledge of some effects that were not significant in several quantitative studies (Garst et al., 2001). In addition to acknowledging the subjective nature of experiences related to developmental adventures, a qualitative dimension might permit a deeper understanding of the processes behind the significant and non-significant results (Martin & Leberman, 2005; Neill, 2003).

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Table 1

Comparison of means for the three groups at times 2 and 3

Variable	Experimental group <i>n</i> =26						Travel group (control 1) <i>n</i> =14						Soccer group (control 2) <i>n</i> =19						Group x Time <i>F</i> (2.54)	Group <i>F</i> (1.54)	Time <i>F</i> (1.54)
	Time 2			Time 3			Time 2			Time 3			Time 2			Time 3					
	<i>M</i>	<i>M_{adj}</i>	<i>SD</i>	<i>M</i>	<i>M_{adj}</i>	<i>SD</i>	<i>M</i>	<i>M_{adj}</i>	<i>SD</i>	<i>M</i>	<i>M_{adj}</i>	<i>SD</i>	<i>M</i>	<i>M_{adj}</i>	<i>SD</i>	<i>M</i>	<i>M_{adj}</i>	<i>SD</i>			
Self-esteem																					
Athletic	2.82	2.78	0.69	3.30	3.24	0.60	2.22	2.10	0.77	2.06	2.06	0.80	3.01	3.06	0.71	3.03	3.03	0.80	14.22***	1.59	2.75
Social	2.99	3.06	0.54	3.13	3.20	0.56	2.81	2.75	0.62	2.82	2.77	0.72	2.89	2.83	0.54	2.72	2.72	0.62	2.67	0.65	0.022
Appearance	3.11	3.16	0.42	3.26	3.29	0.38	2.76	2.71	0.61	2.86	2.82	0.59	2.81	2.70	0.50	2.67	2.67	0.56	1.43	0.66	0.984
Global	2.97	3.00	0.39	3.23	3.24	0.38	2.59	2.52	0.52	2.58	2.55	0.57	2.91	2.86	0.42	2.80	2.80	0.46	6.22**	0.61	0.05

Note **p*<0.05, ***p*<0.01, ****p*<0.001.

Table 2

Comparison of means for the three groups at times 2 and 4

Variable	Experimental group <i>n</i> =17						Travel group (control 1) <i>n</i> =15						Soccer group (control 2) <i>n</i> =9						Group x Time <i>F</i> (2.35)	Group <i>F</i> (2.35)	Time <i>F</i> (1.35)
	Time 2			Time 4			Time 2			Time 4			Time 2			Time 4					
	<i>M</i>	<i>M_{adj}</i>	<i>SD</i>	<i>M</i>	<i>M_{adj}</i>	<i>SD</i>	<i>M</i>	<i>M_{adj}</i>	<i>SD</i>	<i>M</i>	<i>M_{adj}</i>	<i>SD</i>	<i>M</i>	<i>M_{adj}</i>	<i>SD</i>	<i>M</i>	<i>M_{adj}</i>	<i>SD</i>			
Self-esteem																					
Athletic	2.82	2.78	0.69	3.10	3.01	0.68	2.22	2.10	0.77	2.26	2.25	0.80	3.01	3.06	0.71	3.06	3.06	0.79	4.96*	0.83	4.86*
Social	2.99	3.06	0.54	3.18	3.27	0.49	2.81	2.75	0.62	2.78	2.73	0.65	2.89	2.83	0.54	2.62	2.62	0.58	6.97**	0.79	2.24
Appearance	3.11	3.16	0.42	3.32	3.34	0.41	2.76	2.71	0.61	2.87	2.81	0.64	2.81	2.70	0.50	2.83	2.83	0.56	0.90	2.12	0.22
Global	2.97	3.00	0.39	3.20	3.21	0.43	2.59	2.52	0.52	2.64	2.60	0.56	2.91	2.86	0.42	2.83	2.84	0.37	8.75**	0.23	4.53*

Note **p*<0.05, ***p*<0.01, ****p*<0.001.