

# **Effects of a Tall Ship Sail Training Experience on Adolescents' Self-Concept**

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## **Abstract**

This study investigates the impact of a sail training education programme on the self-concept of a group of 147 adolescents. The Competence and Social domains of Bracken's self-concept scale were assessed by a quasi-experimental design in three phases: before commencement of the activities, on the last day of the voyage, and three months after completion of the program. A significant difference (Competence: Effect Size 0.2,  $p < .001$ ; Social: Effect Size 0.23,  $p < .05$ ) was identified soon after the sail experience, but this effect was only temporary. Our analysis was confirmed by a bootstrapping technique. Bronfenbrenner's bio-ecological theory was used as a general interpretative framework in order to identify personal and environmental factors that can sustain developmental changes over time.

## **Highlights**

- We analyse short and long-term effects of a sail experience on self-concept.
- Self-concept increases after the sail experience but it reverts back after time.
- We apply Bronfenbrenner's bio-ecological theory as an interpretative framework.
- We identify Chrono- and Meso-systemic factors influencing Self-Concept's stability.

## **Keywords**

Outdoor education; Sail Training; Self-concept; Bio-ecological theory

Outdoor experiences in the natural environments constitute a cross-cultural activity (Fabrizio & Neill, 2005) that has been used in various societies as a medium for the personal and collective development of young people. Living and learning in the outdoors is believed to foster positive psychological, social and physiological effects in humans (Lewis, 1996). In **Western** society these types of programmes have taken several names and definitions. In a recent online review, Neill (2004) counted up to 45 terms which are similar or closely related to the concept of education in the open air.

Since some of the terms in this paper were developed and co-constructed by a wide range of educators, psychologists and naturalists over several centuries, they often hold different meanings for different people. For the sake of this paper, we shall use the term outdoor education when speaking about any kind of programme or activity aiming at improving human skills and abilities in an open-air environment, while we will use the term “sail training” when discussing a specific kind of outdoor education programme in which participants’ activities are experienced aboard a sailing vessel. Outdoor education, following the suggestion of several authors and governmental documents (Bisson, 1996; Priest, 1986; Scottish Education Department, 1971), is in fact an umbrella term comprising a broad range of component parts. For instance, (Priest, 1986) pictures outdoor education using a metaphorical model of a tree and identifies six components as key aspects in its definition, stating that: it is a method for learning; it is experiential; it takes place primarily in the outdoors; it requires use of all senses and domains; it is based upon interdisciplinary curriculum matter; and it is a matter of relationships involving people and natural resources.

Over the past century the use of outdoor education has widely extended in **Western** society. As an example we could mention the Scout movement, which started in the

United Kingdom in 1907 through the efforts of Robert Baden-Powell and today is spread over 216 countries, involving more than 28 million youth and adults (The Scout Information Centre, 2006).

A typical outdoor education project combines both physical and psychological activities with life in the open-air: “Outdoor education involves organised, small-group, multi-day expeditions in relatively natural environments, with an emphasis on experiential education and life skills” (Neill, 2008). (Neill, 2008) In some cases such programmes include physical, recreational, environmental and even therapeutic aims. Today, such programmes spread from the deserts of the United Arab Emirates, to the Nordic regions of Sweden and Canada, to the seas of Australia and New Zealand. In recent years a growing body of literature has further advanced the philosophy, research and methodology of outdoor education (Harris, 2000; Hattie, Marsh, Neill, & Richards, 1997; Neill, 2008; White, 2012; Zook, 1985).

Among the wide outdoor constellation of programmes, sail training is a well-founded and documented educational activity (Aguiar, 2003; Grocott & Hunter, 2009; Hamilton, 1988; McCulloch, McLaughlin, Allison, Edwards, & Tett, 2010; Norris & Weinman, 1996). Sail Training is a type of education that occurs aboard sailing vessels, which can accommodate a group of young people and one or more staff, who are usually required to have a good degree of educational expertise in addition to seamanship skills. The group spends a period of time at sea, normally under sail power. The focus of a sail-training programme, however, is the trainees’ human development, not their ability as sailors (McCulloch, McLaughlin, Allison, Edwards, & Tett, 2010).

Sail training and outdoor education programmes are generally considered to have positive effects on many aspects of individual development and personality, such as

leadership, self-concept/self-esteem, locus of control, interpersonal attitudes, physical fitness and environmental awareness (Hattie et al., 1997). However, a large gap remains between the wide positive regard obtained by phenomenological and subjective post-program surveys, and more objective methods of evaluation like pre-post program testing based on standardised international scales and questionnaires (Neill, 2002). It is not that one method is superior to the other: in such a complex field as educational psychology, both end-of-program self-reports and the measurement of different dependent variables by basic pre-post research designs represent valuable sources of evidence. Nevertheless, in several outdoor education studies, those two systems have generated responses of a different magnitude and often quite divergent results (for a complete review, see: Neill, 2002). Therefore it is more than legitimate to raise some doubts about the real effect of the outdoor programmes on the participants' development. One of the most assessed factors in outdoor education is self-concept (Harris, 2000; Hattie et al., 1997; Neill, 2002, 2008). This is defined as "a multidimensional and context-dependent learned behavioural pattern that reflects an individual's evaluations of past behaviours and experiences, influences an individual's current behaviours, and predicts an individual's future behaviours" (Bracken, 1992, p. 10). It is considered an overall view of self that is correlated with both a good level of mental health and a positive set of cognitive and social skills (Byrne, 1983; Shavelson & Bolus, 1982). Several studies have reported a positive moderate correlations between a self-concept measure and school performances (Oerter, 1989).

A review of meta-analytic studies on the outcomes of outdoor education (Neill, 2002), reports an overall effect size (ES) of between .3 and .4. Such results are in line with non-OE programmes the overall ES of which is .37. Also, impacts of OE programmes

on personality constructs such as self-concept and locus of control are estimated to be small to moderate. For instance Hattie et al. (1997) analysed six categories of outdoor education programmes, with an average immediate ES of .34. Among all the different types of programme, the smallest ES reported by the authors was that of self-concept (.28), even though this seems to have the greatest follow-up effects (.23).

Positive effects on some personality constructs were found by a few studies on sail training. For instance a 1993 study on psychological changes following a three-month voyage from the UK to the Caribbean (Norris & Weinman, 1996) showed an immediate positive and significant effect of the adventure on the participants' self-esteem and coping strategies while other domains, such as life satisfaction, health and self-efficacy, did not present any significant effect. This study did not provide a follow-up and therefore there are no data on the stability of those results.

Another study (Grocott & Hunter, 2009) showed significant and persistent effects from a ten-day voyage on self-efficacy (which the authors considered equivalent to self-esteem) in a group of 190 adolescents. Those results showed a long-term effect of the voyage as they were confirmed three months after the end of the expedition.

## **2. Theoretical background: from mono-dimensional measures to a bio-ecological approach**

In many outdoor education programmes, participants' self-concept is assessed in different time phases (i.e. at the beginning and at the end of the activities). Collected data are then analysed on the base of the theoretical background of the assessment tool (for a complete review, see: Neill, 2002). This procedure leads to a mono-dimensional and linear view (Canevaro, 2005) of the self-concept's changes within outdoor education contexts. Moreover, such changes are generally traced to

something that happens within the programme. This kind of explanation represents a “black box theory”, in which changes in participants’ self-concept (i.e., the output) are explained only in terms of a linear effect of something that happens within the education programme (i.e., the box), while, usually, the output is linked to the input by complex, nonlinear functions ([Bunge, 1963](#)).

Such approach fails to give specific environmental and systemic accounts of how and why the participants’ self-concept changes during the programme but then reverts to its previous level after a certain period of time, as established in several studies ([Hattie et al., 1997](#); [McCulloch et al., 2010](#); [Neill, 1997, 2002, 2008](#); [Norris & Weinman, 1996](#); [White, 2012](#); [Zook, 1985](#)).

Usually, when practitioners evaluate outdoor education programmes they do not consider the difference between the outdoor environment and the Milieu – i.e. the social, political and legislative aspects of the daily life ([Scherer, Sax, Vanbiervliet, Cushman, & Scherer, 2005](#)) – as a factor that can affect the individual self-concept, its changes, and its stability over time. In order to explain the effect of environmental factors on self-concept, we endorse as the framework of our analysis the Bio-ecological model of Urie [Bronfenbrenner \(1979, 2005\)](#). This model allows us to analyse the results of the outdoor education projects through a multifactorial and non-deterministic view of human development, in which individual growth is the result of interaction among people, objects, symbols and context. As [Lerner \(2005, p. xv\)](#) outlines: “By Bronfenbrenner’s (1977) description, the model that has emerged from this scholarship has four interrelated components: (a) the developmental process, involving the fused and dynamic relation of the individual and the context; (b) the person, with his or her individual repertoire of biological, cognitive, emotional, and behavioural characteristics; (c) the context of human development, conceptualized –

as the nested levels, or systems, of the ecology of human development he has depicted ([Bronfenbrenner, 1977, 1979](#)); and (d) time, conceptualized as involving the multiple dimensions of temporality – for example, ontogenetic time, family time, and historical time – constituting the chronosystem that moderates change across the life course (Elder, 1998). Together, these four components of Bronfenbrenner’s formulation of bio-ecological theory constitute a process-person-context-time (or PPCT) model for conceptualizing the integrated developmental system and for designing research to study the course of human development”.

In the present paper, the four components of the PPCT model will be used as a possible key for interpreting the outcomes, as follows:

- The *process* component will be used to analyse the kind of activities, roles and relationships going on aboard the ship;
- The *person* component can account for individual variation on the self-concept levels reported;
- The *context* and *time* elements will be used to identify broader factors which may be able to sustain a higher level of self-concept over time.

The PPCT model will help us to see educational outcomes as connected to both personal and environmental features. In this model an outdoor education environment, given its isolated and enclosed nature, represents a perfect example of a microsystem that is defined by Bronfenbrenner as “a pattern of activities, social roles, and interpersonal relations experienced by the developing person in a given face-to-face setting with particular physical, social, and symbolic features that invite, permit, or inhibit, engagement in sustained, progressively more complex interaction with, and activity in, the immediate environment” (Bronfenbrenner, 1994, p. 1645).

### 3. The present study

Drawing on previous research on self-concept and outdoor education, this study follows a quasi-experimental design in which a dependent variable (i.e. the self-concept) is measured by a pre-test post-test procedure. We analyse the outcomes of 11 Specific Educational Programs (SEP) conducted from 1 April to 31 September 2011 in the Mediterranean Sea aboard the Tender to Nave Italia Foundation vessel. The SEPs were selected for inclusion in the study based on their educational objectives (increasing self-concept).

Our hypothesis is that, with self-concept being a context-dependent construct and the Tender to Nave Italia Foundation vessel a peculiar and intense educational setting (i.e. microsystem), extremely different from the environments of daily life, the participants' level of self-concept should shift (i.e. increase or decrease) quite rapidly as an effect of the participants' experience over the course of the SEP. The stability of such change (if any) remains to be tested over time.

We wanted to address two research questions:

1. What are the effects of a short sail training adventure on the Social and Competence self-concept of the participants?
2. Are these effects temporary or stable over time?

#### 3.1 The sail training experience microsystem: Nave Italia

*Italia* is a steel brigantine, 61 m long overall, built in 1993 in Poland, but flying the Italian Navy insignia with Italian Navy officers and complement, a total of 21 crew members. The ship has a beam of 9.20 m, a masthead height of 44.60 m and a draught of 4.80 m. She has a sail plan of 1,300 m<sup>2</sup> and can accommodate up to 25 guests in 11 cabins. At present Nave Italia is the largest European brigantine in



navigation. She is a tender of the Nave Italia Foundation, a non-profit organisation whose aim is the improvement of the well-being of those in the most vulnerable categories of society and the teaching of solidarity and the natural rules of the sea through sailing experience. The foundation is sponsored by the Italian Yacht Club and is mainly funded by private donations, grants and fellowships.

Every year through a call for projects, the Scientific Committee of the Foundation selects approximately 25 SEPs proposed by non-profit organisations, schools or institutions in Italy. The selected projects may use Nave Italia as a context for their educational activities, and the Tender to Nave Italia Foundation educators, staff and resources.

Each SEP, in order to be selected by the scientific committee, has to meet the following requirements:

- The educators of the selected SEP have to work together with one of the Foundation's professional educators, an expert in sailing who acts as a mediator between the life aboard and the group of youngsters coming on the ship. The Foundation's educator has to integrate the SEP goals with the Foundation aims and harmonise life aboard the ship.
- In Nave Italia, participants are not seen as "guests", but as effective members of the crew: each participant has to work aboard, experiencing different tasks, roles and activities.
- Each SEP is required to provide three distinctive phases:
  - T0: The inland preparation of the adventure. This takes place in the months before the journey. All the participating associations are invited to run specific introductory courses. Typical activities at this stage are practical and theoretical workshops such as handcrafts, cooking, sailing

lingo, astronomy, meteorology and introduction to sea life. Depending on their own project, single groups may also want to introduce specific training relating to their own characteristics. For instance, schools may work on subjects such as history, literature or maths, patients' associations may talk about specific disease management such as insulin and diet monitoring for diabetics, and so on. Team building and networking within one's own community is an essential requirement for this preparatory stage.

- T1: The real sailing experience, where youngsters can test and express their previously learned competences and skills.
- T2: The back-home stage, when participants are supposed to share and narrate their trip to other members of the community through specific activities, such as workshops, film making, play, book and articles writing, interviews, and so on.

All the SEPs shared a common main goal: improvement of the participants' self-concept. Each programme included a central section in which the participants spent five days at sea aboard the ship. In order to reach this common aim, all the SEPs' educators followed the same programme of educational activities during the sailing days. The in-land preparation and follow-up activities were managed by the educators of each SEP, and presented some specificities which were always agreed upon with the Nave Italia Foundation.

#### **4. Methods**

#### *4.1 Participants*

The analyses conducted in the present study were based on data from Nave Italia activities during 2011. Out of the 25 SEPs of the 2011 season, only 11 agreed to use the MSCS scale. Some were excluded because of the inadequate cognitive level of the participants, some because the age of the applicants was out of the suggested age range of the MSCS, others because it was not possible to ensure the submission of the test the required three times, and some because increasing self-concept was not one of their educational objectives. The overall sample was composed of 147 Italian adolescents who participated in one of the 11 SEPs aboard Nave Italia in 2011 who agreed to use the MSCS scale. The mean age of the participants was 13.18 years (SD = 4.21). Boys comprised 56.4% of the sample. Some of the participants either had chronic diseases or some kind of physical or cognitive disability, while others were school drop-outs or youngsters with a penal sanction or came from at-risk communities with a low income and/or high criminality rates.

#### *4.2 Self-concept measure*

Self-Concept was measured using the Italian version of the Multidimensional Self-Concept Scale (MSCS, [Bracken, 1992](#)).

The MSCS is composed of six sub-scales: Social, Competence, Affect, Academic, Family, and Physical. Each sub-scale has 25 items and can be considered independently or in combination with other sub-scales. Raw scores are converted to standard scores and percentile ranks. Also, confidence intervals are easily established for the 85%, 90%, 95% and 99% confidence levels.

The SEPs' educators agreed to test only two scales of the Italian version of the MSCS: the Competence (C) and Social (S) self-concepts ([Bracken, 1992, 2003](#)).

These two scales are well validated and standardised on a large sample of Italian subjects aged between 9 and 19 (alpha is higher than 0.9 for both the scale).

Competence self-concept is defined as a person's evaluation of his or her ability to get his/her basic needs met. Social self-concept reflects how a person feels about his or her ability to interact with others, participate socially and be accepted within social settings ([Bracken, 1992](#)).

Academic and family self-concepts were excluded because those domains were not related to the SEPs' aims, while affect and physical self-concept scales were excluded due to the particular social-emotional state of some of the participants (i.e. oncology patients undergoing major physical changes, emotionally unstable boys and girls undergoing psychiatric therapy).

#### *4.3. Procedure*

Participants were invited by educators to complete, as part of the educational activities, the Competence and Social sub-scales of the MSCS in three different phases of the sail training experience: before the experience (T0), on the last day of the sailing experience (T1) and two months after the experience (T2).

All the educators involved in the SEPs were previously trained by the Nave Italia foundation in the MSCS administration. To encourage participants' truthful answers, it was emphasised that their responses would be confidential, and would be analysed collectively and not individually. Participants were also told that there were no right or wrong answers to any of the questions and that honest responses were of great importance in the study. It took around 25 minutes for the participants to complete the scale.

#### 4.4 Statistical analysis

Initially, descriptive analysis (Mean [M], Standard deviation [SD], Interval of confidence [CI], Skewness [Sk], Kurtosis [K], and frequency) were conducted to explore individual differences and to compare the Competence and Social self-concept variations between T0, T1 and T2. Also Cohen's  $d$  was estimated in order to analyse the size effect of each SEP and all the aggregated data of the SEPs, and the effect was interpreted in tune with Cohen (1988) as follows: i) small effect when  $0.2 \geq d < 0.5$ ; ii) moderate effect when  $0.5 \geq d < 0.8$ ; iii) large effect when  $d \geq 0.8$ .

The distribution of our data was estimated by the Kolmogorov-Smirnov test and it turned out to be non-parametrical (Lilliefors, 1967). Therefore, in order to identify significant differences in the participants' level on the Competence and Social scales, we applied a Wilcoxon signed-rank analysis, which is recommended for data not normally distributed (Wilcoxon, 1945). This analysis was performed between phases T0 and T1 (i.e. the short term effect) and T0 and T2 (i.e. the persistence of the effect).

Concurrently, using a bootstrap resampling methodology, we extrapolated from the distributions of the two test scales gathered in each phase (T0-T1 and T0-T2) four randomised samples of 1000 subjects. Bootstrapping (see, for a complete review, Efron, 1979) is a process of statistical inference based on building a sampling distribution for a statistic by resampling from the data at hand, using the sample data as a population from which repeated samples are drawn (for a general introduction to bootstrapping methods, see Fox, 2002).

We applied the bootstrap method because, as Arkins, Tolson and Cole (2005) outline, it overcomes the "limitations of the classical approaches in working with small sample sizes and non-normal distributions. [...It] is considered superior to

standard statistical tests of significance because it reduces the threat of multiple comparisons bias and provides information on the distribution of scores (and not parametric distributions); the technique is not dependent on a specific nominal size such as 5% and therefore is more accurate” (p. 5).

A paired samples t-test analysis of these bootstrapped distributions allowed us to compare the significant differences between the Competence and Social scales in the different phases in a predictive sample of 1000 participants. All the data were processed using the software IBM® PAWS Statistics18.

## 5. Results

### 5.1 Sample outcomes analysis

In an overall sample of 147 participants, only 125 (69 male, 56 female, age  $M=12.37$ ,  $SD=3.29$ ) completed the two scales in the T0 and T1 phases. As many studies underline (Hattie et al., 1997; McCulloch et al., 2010; Neill, 1997, 2002, 2008; White, 2012; Zook, 1985), the mean values of self-concept scales (Competence and Social), between T0 and T1, increase during the sailing activities. By analysing the aggregated data of all the SEP participants this trend is confirmed, as shown in Table 1.

----- [Table 1 here] -----

The effect sizes of all the aggregated data of the SEPs reach Cohen’s  $d$  threshold of 0.2, indicating that the all the SEPs have a small effect. Moreover, in order to discriminate the effect of each SEP we analysed separately their ES (see Table 2).

----- [Table 2 here] -----

The data in Table 2 indicate that most of the SEPs (1, 2, 8, 9, 10 and 11) have an ES from small to moderate for both the measured scales of self-concept. It should be noted that “a small effect size can be very impressive if the outcome is difficult to change (e.g. a personality construct) or particularly valuable (e.g. an increase in life expectancy). Conversely, a large effect size does not necessarily mean that there is any practical value in the change, such as when an outcome is not related to the aims of an intervention” (Neill, 2008, p. 69).

When we consider the data gathered between phases T0 and T2, only 79 (46 male, 33 female, age  $M=12.55$ ,  $SD=2.98$ ) of the total of 147 participants completed both the scales. The analysis of the mean of the self-concept scales also shows that between T0 and T2 there is a tendency for the score after the end of the projects to be higher than the scores in T0 (see Table 3).

----- [Table 3 here] -----

We We used the Wilcoxon signed-rank test in order to analyse the modifications in the participants’ self-esteem, in phases T0–T1 and T0–T2, by observing the variation of the participants’ scores on the Competence and Social scales.

This analysis confirms the ES analysis, and it shows that there is a significant short-term effect from sail training (T0–T1) on participants’ self-concept, as follows:

- On the Social scale, participants showed a significant difference between the two phases ( $z= -2.39$ ,  $p<.05$ ). For a total of 36% of the participants their

interpersonal score decreased ( $t_0 > t_1$ ), while for 56.8% it increased ( $t_0 < t_1$ ); 7.2% maintained the same score ( $T_0 = T_1$ ).

- On the Competence scale, there was a strongly significant difference between the two phases ( $z = -2.87$ ,  $p < .001$ ). For a total of 38.4% of the participants their score decreased ( $T_0 > T_1$ ), while for 54.4% it increased ( $T_0 < T_1$ ); 7.2% maintained the same score ( $T_0 = T_1$ ).

Moreover, by analysing the effects of each SEP separately between T0 and T1, we identified, in tune with the ES analysis in Table 2, that only three SEPs (2, 9 and 10) showed a significant increase ( $p < .05$ ) on the Social scale and a strong increase ( $p < .001$ ) on the Competence scale.

At the same time, when we consider the persistence of the effect ( $T_0 - T_2$ ) the Wilcoxon test shows that for both the scales there are no significant differences between the participants' scores gathered in T0 and in T2:

Interpersonal Scale ( $z = -1.62$ ,  $p = .106$ );

Competence Scale ( $z = -.864$ ,  $p = .387$ ).

These results are in line with the fact that ES between T0 and T2 is less meaningful (i.e.  $ES < 0.2$ , see Table 3) than the effect between T0 and T1 (i.e.  $ES > 0.2$ , see Table 1). In sum, while an ascending trend is evident in the participants' scores (see Table 3), the increase in the scores on the two scales after the end of the project is not significant.

Albeit the differences are not significant, the Wilcoxon analysis shows that in SEPs 2, 9 and 10 participants have the greatest increase in self-concept between T0 and T2. Finally, this analysis suggests that after the end of the project (T2) self-concept, which increased during the programme (T1), returns to the starting level (T0).



## 5.2 Bootstrapping the sample analysis

Justification of the lack of effect in T2 could be that the sample size used for our analysis was small. By following this assumption we can formalise an alternative hypothesis (Alternative Hp): we are not able to identify effects on the social and competence self-concepts after two months of sailing activities because our sample size is not large enough.

As we have underlined, many other studies ([Hattie et al., 1997](#); [McCulloch et al., 2010](#); [Neill, 1997, 2002, 2008](#); [White, 2012](#); [Zook, 1985](#)), by using different sizes of samples, have obtained results similar to our findings; therefore, we cannot immediately discard this Alternative Hp.

In order to test this hypothesis, we applied a predictive analysis through a bootstrapping resampling methodology. Through this technique we extrapolated, from the distributions of the test scales gathered in the phases (T0, T1, and T2), four randomised samples of 1000 subjects:

- the T0 and T1 bootstrapped distributions, originally composed of the data gathered from 125 participants who had completed the scales in these two phases;
- the T0 and T2 bootstrapped distributions, originally composed of the data gathered from 79 participants who had completed the scales in these two phases.

These bootstrapped distributions allowed us to test the alternative hypothesis by a paired samples t-test analysis; in these distributions we bootstrapped the interval of confidence of the data, so increasing the generalizability of our results (see Table 4).

----- [Table 4 here] -----

The bootstrap analysis showed that on a simulated sample of 1000 participants a small effect between phases T0 and T1 is confirmed, while the effect between phases T0 and T2 decreases to less than the threshold of 0.2.

The t-test analysis of the bootstrapped distributions confirmed that during the sailing activities (T0–T1) there is an effect on the participants' self-concept only for the Competence scale ( $p < .05$ ), while, in contrast to the previous Wilcoxon signed-rank analysis, no significant differences are shown for the Social scale.

At the same time, the analysis of the effect between T0–T2 confirms that any effects of the sailing activities disappear two months after the end of the project.

This analysis, together with the evidence that similar results have been gathered in many other studies with different sample sizes, allows us to reject the alternative  $H_p$ .

## **6. Discussion**

In relation to our research questions, our results clearly show that:

1. Even brief sail training programmes, headed by good inland preparation activities, can have marked positive short term effects on the participants' Social and Competence self-concepts.

In coherence with the contextual nature of self-concept measures, those effects are only temporary and fade away after three months of sail training, when people return to their daily life contexts.

These results are partially in line with the findings of several other studies on the outcome of outdoor education. In fact, in a remarkable review, Neill (2008) reports small to moderate long-term effects of outdoor education programmes. Most of these effects are deduced by an additive interpretation of effect size in different phases and should therefore be interpreted with caution. Long-term results are not significantly confirmed by our findings, even though a tendency towards the same direction is present. However, it should be noted that the duration of Nave Italia Programmes are very limited in comparison to most other outdoor education programmes and this could well be the reason for the lack of stability of changes in self-concept. According to Rickinson and colleagues (2004), reported by Neill (2008), most effective education programmes are those which present the following characteristics: they are of longer duration, provide well-designed preparatory and follow-up actions, use learning activities and assessments which are linked to the school; they provide facilitation of the learning process; they create a good connection between the programme aims and practices.

We believe that an examination of the educational microsystem of the sail ship based on Bronfenbrenner's bio-ecological theory (1979, 2005) can shed some light on the educational dynamics which play a fundamental role in shaping the self-concept of the sample in our research. When its structure is broken down, a microsystem is itself composed of three basic elements: activities, relations, and roles (the process-context components of the model) in which the people engage. How do those aspects configure themselves aboard Nave Italia?

- *Activities:* One aspect of the activity on board a tall ship is that given the circumscribed environment, the effect of any human action is immediately manifested. Moreover, such actions have a clear and visible meaning both to

the person performing it and to others. For instance, when a group of teens are called to haul aft the main-sheet, they immediately feel an attitude change on the ship. If a participant is called to kitchen duty, a few hours later he or she will see the whole crew enjoying the meal he/she has contributed to the preparation of. From the bio-ecological point of view, this immediate connection between the activity and its goal makes almost every occupation a molar activity; that is, an “on-going process possessing a momentum of its own and perceived as having meaning or intent by the participants in the setting” (Bronfenbrenner, 1979, p. 45). According to Bronfenbrenner, engaging in such meaningful tasks constitutes both the internal means and the external expression of psychological development (Bronfenbrenner, 1979). The link between a molar activity, played in an outdoor education setting, and the individual’s perceived ability to perform various actions in his or her environment (his/her Self-Competence) is evident. Aboard the ship, each participant is engaged in several molar activities during the day. Those activities provide chances for participants to independently explore new roles and possibilities of functioning while being actively in control of their own actions and outcomes. The confined environment allows participants to receive immediate and, often, positive regards from others. Many of the above outlined aspects present themselves several times each day on board the ship, significantly increasing the Competence self-concept between T0 – T1. Nevertheless, this set of molar activities ceases to exist or at least fades away to a remarkable extent once back home. Hence the decrease in the Competence self-concept in T2.

- *Relation*: “A relation obtains whenever one person in a setting pays attention to or participates in the activities of another” (Bronfenbrenner, 1979, p. 56). What happens in the activities aboard the ship applies also to relationships. In the ship’s context, each other’s attention and collaboration is constantly required. Each participant feels a strong relation to the crew and trip mates, and friendships and connectedness grow very quickly during the expedition. This leads each participant to perceive a strong support and encouragement for learning from the other members of the context, and such connectedness represents an important bio-ecological developmental construct (Marjoribanks, 1985). The positive impact of peer group and social interaction on self-concept has been clearly observed (Oerter, 1989). Approval within the peer group is considered particularly important for the development of self-concept (Connolly & Konarski, 1994; Salmon, 1979). Because of this, it is no surprise that in the sail-training setting most people increase their perception of interpersonal skills. However, given the confined environment of Nave Italia microsystem, sometimes social contacts are forced and some people may feel the effects of the lack of privacy. This could be one of the reasons why self-concept in T1 decreases for 36% of the participants. Other reasons could be found in the quite regimented and hierarchical social relations of a ship run by Navy Officers and complement, and in the fact that sometimes it is not so easy to develop social relations within such a social structure. According to the bioecological PPCT framework, reasons for individual variance should also be sought in the characteristics of the person taking part in the process. This aspect was not considered in our study due to lack of resources. It could, for instance, be studied by adding some kind of qualitative and narrative

The bootstrap analysis clarifies that, albeit the participants' Social self-concept globally increases between T0-T1, the difference is not significant.

- *Role*: “A role is a set of activities and relations expected of a person occupying a particular position in society, and of others in relation to that person” (Bronfenbrenner, 1979, p. 85). The third aspect that changes dramatically aboard the ship is role expectancies. The outlined combination of activities and relationships push each participant to play and discover new and unexplored roles. Thanks to the mediation of the crew and educators, each member of the group is called upon to extend his or her repertoire of roles, and has a chance to discover new capabilities and use some new skills. Those new roles are exhibited in front of and recognised by others, creating a key facilitating aspect of human development ([Bronfenbrenner, 1979](#)). Once again, in all the projects examined, roles revert to their previous nature once the participants go back home. This, again, can constitute the basic explanation for the decrease of self-concept in T2 measures.

### *6.1 Making outdoor education programmes more effective over time*

As discussed above, the characteristics of the microsystem could explain why the effect of the sail training programme is only temporary. In fact, the educational microsystems are specific and organized goal-oriented environments (i.e., in our case, increase the participants' self-concept). The Nave Italia microsystem reaches its goal, nevertheless when people participating in the project are outside of this microsystem their levels of self-concept reverts to their previous nature and the effects of the Nave

Italia experience inevitably fade away.

In other words, while the outdoor education context examined pervades every aspect and every moment of the subjects' lives and coherently presents educational activities aimed at increasing individuals' self-concept, participants' milieu is composed of heterogeneous and sometimes conflicting microsystems (i.e. family, schools, peers and so on). According to the bio-ecological system, the developmental power of the proximal processes experienced aboard the ship fails to transfer into the milieu, which presents other proximal processes, with less developmentally positive characteristics (e.g. stability, coherence, active and positive engagement of the subjects in new roles and activities). This leads the developing person to perceive several discrepancies between own goals and other social requirements in his/her daily life. Such discrepancies appear to have repercussions for other developmentally positive characteristics such as motivation, interest in class, perceived control and ability, and perceived social support ([Spera & Wentzel, 2003](#)).

According to Bronfenbrenner's framework, in order to improve outdoor education programmes by extending their effects to the home environment and preventing the decay of their educational effects, practitioners may consider two key bio-ecological aspects:

- The first is the chronosystem, which, according to Bronfenbrenner, “encompasses change or consistency over time not only in the characteristics of the person but also of the environment in which that person lives” (1994, p. 1646). In order to produce meaningful effects, changes operated in the microsystem on board the ship should extend over time (both past and future) and be transferred to the everyday life environment of the participant. This

continuity over time should be one of the aims of the educational project and it should be carefully planned by the educators through a follow-up strategy.

Often, however, outdoor education projects start when the journey begins and end when the adventure or trip finishes, thus accounting for the lack of stability of their effects. In our sample, the three SEPs which reported better results in the MSCS Competence and Social scales are also those which undertook better and longer preparation and post-navigation activities. In fact, SEPs 2, 9, and 10 invested 12–20 more hours in training and in the follow-up than the other projects.

- A second feature of Bronfenbrenner’s model, the mesosystem, suggests ways to make changes more stable over time. “The mesosystem comprises the linkages and processes taking place between two or more settings containing the developing person (e.g., the relations between home and school, school and workplace, etc.). In other words, a mesosystem is a system of microsystems” (Bronfenbrenner, 1994, p. 1646).

A good outdoor education project can guarantee the stability of its effect over time if it aims to create community networks, rather than isolated changes in the individual. For example, a good network between school, families and on-board educators could provide the necessary stability to reproduce and acknowledge in everyday life those microsystemic and individual characteristics which, aboard the ship, changed the participant in a positive way. Because school is the main setting for peer contacts and peer influence during adolescent years ([Oerter, 1989](#)), the inclusion and involvement of the outdoor education’s processes and structures in the school settings becomes crucial.



## *6.2 Future works*

This study confirms the powerful context-related effect on individual self-concept of a specific set of outdoor education programs, namely Nave Italia's educational sail training SEPs. Our analysis allows us to suggest that a wider perspective, such as that suggested by Bronfenbrenner's bio-ecological person-process-context-time model (PPCT), can shed some light on some of the specific systems which instigate such personal changes.

Specifically, chronosystem and mesosystem, which seem to be neglected in many outdoor education studies, should be further and deeply investigated in future works. In particular, we should analyse specific chrono- and meso- systemic factors capable of sustaining the educational changes that occur aboard the ship but then fade away after the end of the programme. While our work identifies the chronosystem and the mesosystem as two important areas of interest in order to maintain the increased level of the participants' self-concept, currently we have no data on those two aspects.

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