Social Representation of Marine and Coastal Environments: a perspective of teachers from southeast coast of Brazil

Geisly França Katon[1], Naomi Towata[1], Flávio Berchez[1], Suzana Ursi[1,2]

[1]Departamento de botânica, Instituto de Biociências, Universidade de São Paulo, São Paulo, Brazil

[2]Programa de Pós-Graduação Interunidades em Ensino de Ciência, Universidade de São Paulo, São Paulo, Brazil

Abstract

We investigated eleven teacher's social representations of marine and coastal environments - SRMCE (through questionnaires and texts), as well as the possible influence of environmental education field activities on them. Most of teachers represented marine environment as resource for survival and benefit of human beings, indicating an Anthropocentric SRMCE. The training experience did not influence on it, since it was a very short experience. However, it positively influenced some other aspects as stronger coastal environments connectedness and relation between these environments and Education. It highlights the potential of training experiences on field as an initial tool to improve teacher´s SRMCE.

Keywords: Environmental Education; Environmental Perception; Field activities; Marine and coastal environments; Social Representation; Teachers training.

E-mail address: suzanaursi@usp.br

Introduction

Most of the threats to biodiversity are in the coastal zone and are a direct result of human population and demographic trends. A number of reviews about these threats support this idea: habitat loss, global climate change and overexploitation (Lundin and Lindèn, 1993). In Brazil, despite the enormous coastal area, we still have few Environmental Education Programs focused on marine and coastal ecosystems when compared to the ones that focus on land ecosystems (Pedrini et al., 2004; Berchez et al., 2016).

One of the difficulties to protect natural environments, including marine and coastal ones, relies on the differences in the perceptions among individuals of different cultures. We consider that understanding Environmental Perception is a crucial step for environmental conservation through Environmental Educational Programs. We understand as Environmental Perception the relation that people establish with the environment in which they are inserted, which occurs through perceptual and cognitive mechanisms (Del Rio and Oliveira, 1996; Whyte, 1977).

Some authors (e.g. Ghilardi-Lopes et al., 2015) highlighted the strong relation between Environmental Perception and Social Representations (SR), since an object is not simply reproduced in the individual's mind, but what brings meaning to this object is a combination of cognitive and social process (Moscovici, 2007). We can assume that Social Representations are sets of principles interactively built and shared by distinct groups that transform their reality; a system of concepts, ideas and established practices that guide people in their community and culture, helping us to make sense of our world and to interact with others (Moscovici, 2007). Therefore, represent or be represented correspond an act of thought by which the subject relates to the object (in this case, the object is made up of marine and coastal environments), that have being elaborated on what you have in hand to classify the pre-existing representations (Jodelet, 1989). When we talk about such a complex theory, some authors consider that SR is broad and vague, one of the most controversial concepts in psychology. Occasionally, some aspects of the theory can be misunderstood (Raudsepp, 2005; Voelklein and Howarth's, 2005).

Therefore, the aim of this work was to investigate teacher's Social Representations of Marine and Coastal Environments (SRMCE), as well as the possible influence of a training experience in Environmental Education on them.
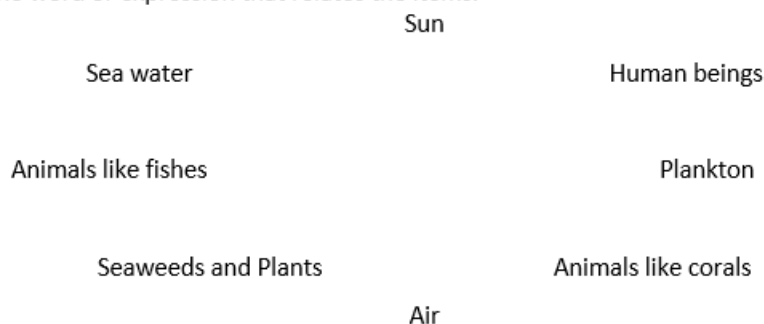
Methodology

This work has a qualitative approach, even if we have performed some simple quantifications. We investigated eleven basic education teachers from a public school from a seaside town located in the southeast coast of Brazil (Ubatuba) who accepted to participate in a field training experience in Environmental Education realized by Underwater Trail Project (from University of São Paulo). The activities were conducted in two days: in the first day, teachers realized the Out of Water Interpretative Trail and Ecosystems Trail activities; in the next day, they did the Observation of a Nature Pool and the Underwater Interpretative Trail (as described by Berchez et al., 2005).

The teachers were investigated through questionnaires applied before and after the activities. They also wrote short reflexive texts about their relationship with the beaches where the activities were performed, before and after the activities. For this paper, we analyzed these short texts and more two questions from a questionnaire (Table 1). The analysis was made by Bardin's Content Analysis technique (2009).

Table 1. Questions analyzed on this work.

Question 1. Imagine that you are looking at a rocky shore: describe what you feel in this environment.
Question 2. Connect using arrows the items you believe that are related. Above the arrow, write one word or expression that relates the items.

Sun

Sea water   Human beings

Animals like fishes   Plankton

Seaweeds and Plants   Animals like corals

Air

Results and discussion

Analyzing the results of question 1, which addresses the feeling the teachers have when looking at the rock shore, we could notice that before the training experience, aspects related to emotions, like personal well-being in the marine environment and enchantment, were most cited and only one teacher wrote about somesthetic sensations (P10). After the formative experience, responses were more varied, including some answers related to the monitors' mediation on the activity (Table 2).

Concerning the second question, none of the teachers established the 28 possible relations among the items. Teacher P7 wrote above the scheme "the human being depends on all the above features and, with the exception of the Sun, is interfering be negatively or positively on all of them". Whereas, teacher P2 wrote "web of life, all elements are interconnected". Teacher P10 made a drawing with arrows coming out of all the items toward a figure that seemed to represent the Earth (Figure 1), which we considered as a relation among all the items.

In the initial questionnaire, a total of 119 connections were made (average of 10.82 connections per teacher) and 31 of these with "human beings" (26.1%). At the end, a total of 116 connections were made (average of 10.55 connections per teacher), and 25 of these with "human beings" (21,6%). In this question, we expected that the number of bonds would be higher after the experience, especially related to human. Words or expressions to relate/connect the items were not used in every arrow, mainly in the final questionnaire in which they wrote things like "see other review" or did the drawing presented in Figure 1.

Table 2. Categories, description, teachers in each category and examples related to the question of how the teacher feels to observe the coastal environment.

Initial	Description	Teachers in each category Initial	Teachers in each category Final	Example
Well-being	Feel good or comfortable in that environment.	P1, P2, P4, P7, P11	P4, P8	I feel good, because I love it. That's what brought me to live in Ubatuba. (P1, initial)
Appreciation	Contemplation of feelings in this environment, as quiet, peace, calm, gratefulness.	P2, P7, P8, P9	P1, P7	I feel very good, because I like a lot of sun and quiet environments. (P2, initial)
Curiosity	Is curious to know what is in this environment.	P3, P9	P6	Very calm, quiet, awe, curious to breaking the very best around. (P9, initial)
Connected	Feel a personal relationship with this environment.	P5	P8	At home. (P5, initial) Wonderfully well. A sense of harmony between the marine environment and me. (P8, last)
Monitors	Guidelines and the work of the monitors the activities were good.	-	P4, P7	I felt very calm and free. The work of the monitors was excellent. (P4, last)
Biodiversity	Enjoy watching biodiversity, micro fauna and was enchanted by the biodiversity of the site.	P7	P3, P9	Marveling at the beauty of the shore, many fish, beautiful marine plants. (P9, last)
Beauty	Enchantment with the beauty of the place.	P6	P9	I am in another world, it is interesting and beautiful to observe the interaction between living things this medium. (P6, initial)
Somesthetic sensations	Reporting somesthetic sensations like wind and heat in the body.	P10	-	Feeling of watching the waves on the coast, the wind and the heat of the sun in my body. Nice feeling. (P10, initial)

We believe that less number of connections and less connection terms in the final questionnaire may have occurred because it was made in the end of the second day of activities, at which teachers showed signs of tiredness. Additionally, we observed that most of the relationships established by teachers on the answer to the second question were related with marine environment as resource for the survival and benefit of human beings, regardless the analyzed questionnaire, initial or final (Tables 3-4).

Table 3. Analysis per teacher about the relations between humans and the items before (initial questionnaire) and after (final questionnaire) the formative experience. Terms in parentheses are the connective terms used by them.

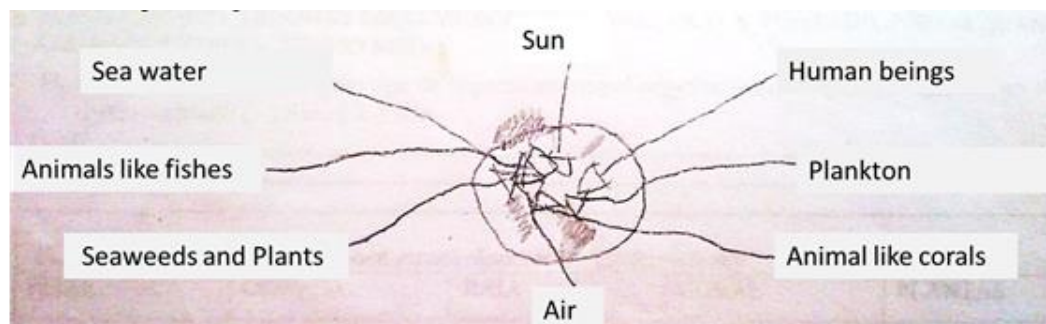| Teacher	Initial	Final
P1	sun (vitamin D) fish (food) air (need)	sun air
P2	plankton (balance)	sun algae and plants plankton
P3	sun (life essential) sea water (food resource) air (essential for survival)	sun (food resource)
P4	sea water (pollution) animals like fish (food) algae and plants (food) air (essential) animals like coral (impact)	sea water (life) animals like fish animals eat fish (food)
P5	air	air animals like fish
P6	animals like fish (food) air (breath)	sun air
P7	sun sea water algae and plants air plankton	wrote "see other review"
P8	sun (D vitamin) sea water (energy and food) animals like fish (food) air (survival) plankton (natural defenses).	sun (warmth) animals like fish (food) air (breath)
P9	air	sun
P10	sun animals like fish algae and plants animals like coral	makes no right arrow, only one figure
P11	sea water	sun air

Figure 1. Drawing done by teacher P10 in the final questionnaire as answer for question 2.

Table 4. General amounts of links established by teachers among the words or expressions.

Link	Initial	Final	Link	Initial	Final
Sun - Sea water	8	8	Sea water - Plankton	6	4
Sun - Human beings	5	8	Animals like fish - Human beings	5	4
Sun - Plankton	7	7	Air - Plankton	2	4
Sea water - Animals like fish	8	7	Animals like fish - animals like coral	4	3
Animals like fish - Algae and plants	4	7	Animals like coral - Plankton	4	3
Algae and plants - Air	6	7	Sea water - Algae and plants	6	2
Sun - Algae and plants	7	6	Sea water - Human beings	5	2
Air - Human beings	8	6	Animals like fish - Air	1	2
Sun – Air	2	5	Algae and plants - Human beings	3	2
Sea water - air	4	5	Plankton - Human beings	3	2
Animals like fish - Plankton	4	5	Sea water - animals like coral	7	1
Air - Animals like coral	4	5	Algae and plants - Animals like coral	0	1
Sun - animals like fish	1	4	Algae and plants - Plankton	1	1
Sun - Animals like coral	2	4	Animals like coral - Human beings	2	1

Total established connections: Initial -119   Final- 116

In the initial reflexive texts, we found the following categories (and occurrence number): Affective Relationship (14), Education (13) Physical Relation (11), Leisure and Sport (9) and Conservation (7). In the final reflective texts, all teachers responded that their relationship with local has suffered some change and the most present category was Education (6), followed by a category that was not present in the initial texts: Conceptual content (4) (Table 5).

Table 5. Categories, description, occurrence number and example found on initial and final reflexive texts.

Categories	Description	Initial	Final	Example
Affective Relation	Affective relationship with marine environment	14	2	"I fell so in love with the Island (...)" P8
Education	Related with development and/or application of educational activities	13	6	"(...) I have been there a few times with the students, to carry out educational activities like trails (...) P7
Physical Relation	Born, live or frequent marine environment	11	2	"Ubatuba is my hometown (...)" P2
Leisure and Sport	Go to marine environment to relax or to play some sport	9	0	"Place where I love to go surfing and where there are few people in the sea" P5
Conservation	The importance of preservation and conservation of marine environments, environmental conservation activities	7	2	"It is up to every citizen to do his part, to know it to preserve it" P2
Conceptual Content	The concepts and contents related to the marine environment that was worked during the activities.	0	4	"Yes, because the activities have updated my knowledge about these environment (...)" P3

Most of the relationships established by teachers in the answer of the second question were related to marine environment as resource for the survival and benefit of human beings, which indicated that the teachers showed an Anthropocentric SRMCE. This kind of representation seems to be very strong to these environments (Ursi and Towata, 2012; Fletcher et al., 2014) and the Underwater Trail Project formative experience did not influence on it, since the results were similar before and after the field activities.

However, the experience positively influenced some other aspects of SRMCE. If we consider the categories "Affective Relationship" and "Curiosity" we can see the uniqueness of SERMC of this teachers group, and especially regarding the presence of some the categories on final reflexive texts: "Education" and "Conceptual content" (after training experience). We believe that the presence of categories which relates marine environment with educational practices in a group of teachers can be considered relevant, since such professionals act as multipliers of environmental concepts and environmental education practices.

An interesting point that emerges when analyzing the data collected, especially in relation to the question of how teachers feel when observing the shore, refers to the frequent appreciative connections they establish. Kaiser et al. (2011) postulated that when measuring the appreciation that individuals have by nature, it is similar to measuring your appreciation for protecting this environment because these two assessments are so strongly correlated that it is difficult to separate them. Generally, people contemplating nature, give more emphasis to its protection. In addition, the presence of the category "connection", particularly in the citations after the activities, can be considered as an evidence of a positive influence of the Underwater Trail Project on the connectedness between the teachers with marine and coastal environment. This positive influence has already been reported by other authors for a variety of public that participated before in Underwater Trail Project (Katon et al., 2013, 2014; Savietto et al., 2014).

Conclusion

Our results showed that the teachers SRMCE are mostly anthropocentric, even after they participated of a field training experience. It was expected that SMRCE did not radically change, because the innate characteristics of Social Representation and the short duration of the training experience. However, teachers' SRMCE after this experience strongly showed aspects related to marine and coastal environments connectedness, as well as the relation between these environments and Education. It highlights the potential of training experiences on field as an initial tool to improve teacher´s SRMCE.

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