Health Education: what influences teachers' and future teachers' conceptions from 16 countries of Europe, Africa and Middle East?

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Abstract

One of the major objectives of the European FP6 BIOHEAD-CITIZEN project on "Biology Health and Environmental education for better citizenship" (STREP, CIT2-CT2004-506015, Carvalho et al. 2004) is to analyse the potential differences between countries by associating teachers' and future teachers' conceptions to controlled parameters, such as level of training, religion, political view and the broad socio-cultural context. A questionnaire was constructed with the participation of all Biohead-Citizen project research teams. The original English version was translated into each national language and after validation of the translation it was pre-tested before implementation in each country. A total of 6379 teachers and future teachers responded to the questionnaire. They were from 16 countries (of the 19 composing the Biohead-Citizen consortium) from Europe (West to East: Portugal, France, Italy, Malta, Germany, Poland, Hungary, Romania, Lithuania, Estonia, Finland, Cyprus), from Africa (West to East: Senegal, Morocco, Tunisia) and from the Middle East (Lebanon). Statistical multivariate methods to investigate complex data featuring the conceptions of many individuals were used.
Results showed that the countries, rather than religion, have great effect on teachers and future teachers' views conceptions on biomedical model or the health promotion approach. Furthermore primary school teachers (P), both in-service (InP) and pre-service (PreP), are more associated to the health promotion view than all the secondary school teachers: in-service Biology (InB), in-service Language (inL), pre-service Language (PreL) and pre-service Biology (PreB) teachers. Pre-teachers consider that health education should be taught at school, not only by the families, and that teachers should be obliged to teach even if they do not feel confident in doing it whereas teachers with teaching experience are more defensive in this respect, assuming exactly the opposite. In addition, the co-inertia analysis allows highlighting the correlations between differences in health education conceptions and the differences on political views.

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1. Introduction

Health Education is determined not only by the social context (i.e. the living conditions at the school, the attention paid to the pupils' health and wellbeing, Allensworth and Kolbe, 1987; Gold, 1994) but also by the teaching pedagogical practices. In the 20th century the Education systems of western countries have developed important actions to improve persons' health and to promote healthier life-styles. Since children and young people from most diverse social and cultural backgrounds spend most of their daily life at school, these institutions have been seen as a privileged setting for identifying children's health needs and implementing health education interventions.

A high public investment in the second half of the 20th century has been devoted to national infrastructures and services to protect health and to prevent diseases. Simultaneously, and due to the high costs in the health sector, the argument that "prevention is cheaper than curing" persuaded the national health authorities to extend their work beyond the prevention of diseases towards the notion of improving health through health education (Katz and Peberdy 1997; Green 1999), such as family planning, venereal disease, accident prevention, vaccination, female cervical smear checks, weight control, alcohol consumption and smoking (DHSS 1976). This view of health education is well inscribed in the classical "biomedical model of health".

In the 70s high emphasis in health educational campaigns was done in order to transmit information about diseases and the ways to prevent them, mostly by promoting behaviour changes. In general these educational programmes focused on the transmission of information – or knowledge – without accounting for pupils' socio-economic contexts, so that the impacts in terms of healthier behaviour changes were not significant (Scriven 1996). This narrow emphasis on the absence of diseases or infirmity as well as on the personal life-styles became criticised in the 1970s it distracted attention from the social and economic determinants of health and tended to blame individuals for their own illness (Ewles & Simnet 1999).

A broader approach of "health promotion" emerged in the 1980s, addressing not only the transmission of knowledge (traditional health education) but also the need for political and social action as well as the involvement of the persons themselves in shaping their own health future. In this period, and with the urgency to prevent the AIDS dissemination, the role of health education became socially more important and a new generation of interventions have been set up, mainly based on attitude and behaviour changes. These educational campaigns had in mind not only the social context but also the need for pupils' empowerment for making healthy choices (Jones & Naidoo, 1997; Ewles & Simnett, 1999).

The high social impact of this area of knowledge and social intervention lead to an immensity of attempts to define "Health Education", most of them based upon the close-related concept of "Health Promotion" defined by the World Health Organisation (WHO, 1986:1): *"Health promotion is the process of enabling people to increase control over, and to improve, their health"*. Of the several proposed definitions of Health Education (O'Donnell, 1989; Green & Kreuter, 1990, 1991, among others) we wish to highlight the one by Keith Tones e Sylvia Tilford (1994:11):

> *"Health Education is any intentional activity conducting to health and disease learning, producing changes in knowledge and understanding as well as changes on the way of thinking".*

The same authors further stated that health education may (or may not) clarify and influence values, may (or may not) promote beliefs and attitude changes, may (or may not) enable acquisition of personal skills and it can conduct to healthier behaviour and lifestyle changes. This view embraces the idea that knowledge, values and behaviours/practices are important issues for an effective health education. Similarly, the Clément's KVP model claims that for any person's "Conception" three distinct dimensions are interacting, namely his/her "Knowledge" (K), his/her "Values" (V) and his/her "Practices" (P) (Clément 2006).

We intend to analyse teachers' conceptions about health education according to the Clément's KVP model. The present work was carried out within the European FP6-STREP project Biohead-Citizen ("Biology, Health and Environmental Education for better Citizenship" - CIT2-CT2004-506015; Carvalho *et al.* 2004). For this purpose we questioned teachers of 16 countries: from Europe (West to East: Portugal, France, Italy, Malta, Germany, Poland, Hungary, Romania, Lithuania, Estonia, Finland, Cyprus), from Africa (West to East: Senegal, Morocco, Tunisia) and from the Middle East (Lebanon).We aim to analyse differences in teachers' conceptions (and future teachers' conceptions) about health and health education with regard to several influencial parameters: country, religion, level of God belief, level of religious practice, political view, and teachers' academic degree.

2. Methodology

The questionnaire includes questions on Biology, Health and Environmental Education as well as Personal Information and was designed by all the research teams of the Biohead-Citizen Project. The original English version was translated into each national language and after validation of the translation it was pre-tested before implementation in each country (Clément et al. 2007).

Six samples were collected in each of the 16 contributing countries: in-service (In) and pre-service (Pre) teachers of primary school (Ps) and of secondary schools (Ss) in biology (B) and national language (L).

The overall corpus includes 6379 responders. The number of responders in Europe were (from West to East): 351 from Portugal (PT), 732 from France (FR), 559 from Italy (IT), 198 from Malta (MT), 365 from Germany (GE), 311 from Poland (PL), 334 from Hungary (HU), 273 from Romania (RO), 316 from Lithuania (LI), 183 from Estonia (ES), 306 from Finland (FI) and 322 from Cyprus (CY). From African countries the following responders were obtained (West to East): 324 from Senegal (SN), 330 from Morocco (MA) and 753 from Tunisia (TN). From the Middle East country, Lebanon (LB), 722 responders were obtained.

We investigated 16 questions on Health Education (cf. annex): A55, A63, A67, A68, B1, B2, B6, B9, B12, B15, B16, B21, B22, B23, B25, B26, B27. All questions, except A55, A63, A67 and A68, were coded from 1 to 4, from "I agree" to "I disagree".

Multivariate analysis allows representing the most structuring components of variation in the individuals' answers. Statistical multivariate analysis has become a standard to investigate complex data featuring the behaviour of many individuals, according to many variables (Lebart et al., 1995). Here variables are questions in a questionnaire for which we gathered answers. To analyse the health education answers, we used the principal component analysis (PCA, Lebart et al., 1995). Variables were coded as numbers. We further performed a between group analysis (Dolédec & Chessel, 1987) in complement of the initial PCA (which differentiate all the persons) to show differences between groups'

conceptions (groups of countries, samples of teachers, level of training, religions, and faith). Each between groups analysis was completed by a randomisation test (Monte Carlo) to analyse the levels of significance differences between groups. When two variables can be in interaction, we will suppress the effect of one by orthogonal PCAVi to analyse the effect of the second variable independently to the first suppressed one.

3 Results and discussion

3.1. Health education conceptions in 16 countries

Health education is a very complex area of research where it is possible to identify several axes of values defined by specific poles (Carvalho & Carvalho, 2005). In part A of the questionnaire we included two questions, A55 and A66 concerning two axes of values. Question A55 regards the tension between the goals of school health education between "Providing knowledge" and "Developing behaviour that is respectful of one's own health" (Mérini et al., 2004; Broussouloux & Houzelle-Marchal, 2006). Question A66 concerns the poles of the "biomedical model" and the "health promotion" approaches (Jones & Naidoo, 1997; Ewles & Simnett, 1999; Carvalho et al., 2007).

These questions were presented to 6379 teachers and future teachers of 16 countries. The answers of question A55 were coded 1 to 4. In question A63, three items are within the biomedical model and the other 3 in the health promotion pole; the responders had to select 3 expressions. The code was 0 to 3, where 0 corresponds to the biomedical pole and 3 to the health promotion pole.

A55. In your opinion, the main goal of health education in school should be (tick only **ONE** of the four boxes)**:**

Providing knowledge ☐☐☐☐ Developing behaviour that is respectful of one's own health

Coding:

| 1 | 2 | 3 | 4 | | 99 No answer |

A63. **Health can be seen in several perspectives.** In the list below, tick the THREE expressions that you think are the most strongly associated with your *personal view of health:*

Coding:

- ☐ Not suffering from any serious disease. ☐
- ☐ Feeling at peace with myself. P
- ☐ Enjoying my life without feeling too much stress. P
- ☐ Having my body components working well. ☐
- ☐ Being in good condition to be socially active. P
- ☐ Having no need to see a doctor, for treatment. ☐

Coding:

Number of answers P	0 P	1 P	2 P	3 P	No answer or invalid answer
code	0	1	2	3	99

School Health Education

The analysis of question A55 among the 16 countries shows that the majority of the responders have the notion that the main goal of health education in school is "Developing behaviour that is respectful of one's own health" (code 3 plus 4), and the statistical analysis indicates that there are significant differences among the countries score means (X^2 = 820.7, df = 45, p value <$2.2x10^{-16}$). Teachers and future teachers from Romania (score mean 3.72) and Morocco (3.66) are the most ones in favour of this view whereas the ones from Cyprus (3.18) and Germany (3.22) are more in favour of the idea that the main goal of school health education is "Providing knowledge".

Biomedical model and Health promotion approach

Results from question A63 on Biomedical model (BM) and health promotion (HP) approaches show very significant differences among teachers and teachers to be from the 16 **countries**, when codes 0, 1, 2 and 3 are analysed separated (X^2 = 904.1, df = 45, p value <$2.2x10^{-16}$). Grouping the codes 0+1 of BM and grouping the codes 2+3 of HP, the differences among countries responders are also significant (X^2 = 665.5, df = 15, p value <$2.2 x10^{-16}$). This distribution of BM/HP in each country is shown in Figure 1, where Tunisia is strongly BM (90.0% BM / 10.0% HP) whereas Lithuania (33.5% BM / 66.5% HP) and Finland (33.6% BM / 66.4% HP) are close to the health promotion pole.
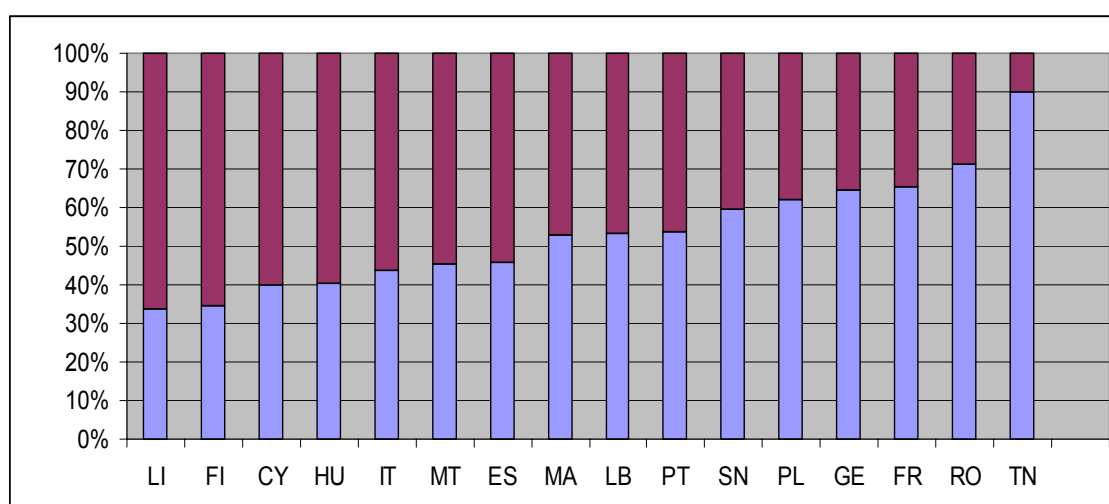
Figure 1. Percentage of BM (blue) and HP (pink) answers in the 16 countries. Numbers represent BM percentages.

The northern countries Finland, Lithuania and Hungary as well as Cyprus (with strong British influence) are closer to the health promotion pole whereas Central Europe countries, namely Romania, France, Germany and Poland, as well as Tunisia (with strong French influence) are closer to the biomedical model perspective.

In addition, the statistical analysis showed that the conceptions of Biomedical model (codes 0+1) and health promotion (codes 2+3) are more associated to the countries rather than to the responders' **religion** (question P13). However significant differences (X^2 = 149.3, df = 3, p value <$2.2x10^{-16}$) were also found, being the Christians closer to the health promotion pole than the Agnostics or the Muslims. The latter are more associated to the biomedical pole.

Significant differences (X^2 = 35.7, df = 4, p value = 3.246x10^{-07}) are also found in the **religious practice** (question P12), and results show that those that practice more their religion (codes 1+2) are closer to health promotion than those that do not practice it.

These results altogether indicate that the country effect is stronger than the religious effect as far as the biomedical model and health promotion conceptions are concerned: for instance Poland and Romania are Christian countries, but in the biomedical pole. In the Muslin countries, Tunisia in more biomedical than Morrocco. We also analysed how the conceptions on the Biomedical model and health promotion are associated to the **groups of teachers** (question P1): in-service (In) and pre-service (Pre) teachers, of primary school (Ps) and of secondary schools (Ss), in biology (B) and national language (L). There are statistical differences among the teachers' groups (X^2 = 55.5, df = 5, p value = 9.903 x10^{-11}) and results show that the primary school teachers (Ps), both in-service (Ps-In) and pre-service (Ps-Pre), are more associated to the health promotion pole than all the secondary school (Ss) teachers: in-service Biology (Ss-In-B), in-service Language (Ss-in-L), pre-service Language (Ss-Pre-L) and pre-service Biology (Ss-Pre-B) teachers.

The fact that the primary school teachers are closer to the health promotion pole than the secondary school teachers is a very interesting finding as it is in agreement with our previous study on textbooks (Carvalho et al., 2007) showing that, likewise, primary school textbooks of the 16 countries are more linked to the health promotion concept than the secondary school textbooks. In fact, those results have examined the BM/HP proportion, in both text and the images, from the youngest pupils' textbooks (age 6-9 years) up to the eldest ones (age 16-18 years), showing a general tendency towards an increase of Biomedical Model. This has been observed not only in countries more associated to the Biomedical pole but also in countries at the Health Promotion pole (Carvalho et al., 2007).

Authors and publishers of all these countries seem to have a similar perspective in terms that for earlier years the textbooks must be more devoted to pupils' good health and healthy habits whereas for older ages the textbooks must give more emphasis to the transmission of knowledge about diseases (Pathologic), treatments (Curative) and disease prevention (Preventive) in order to make young people aware of unhealthy habits. Similarly, teachers' conceptions gathered in the present study indicate that not only the authors and publishers (Carvalho et al., 2007) but also teachers see health promotion as a perspective for health education more appropriate in primary school than in secondary school.

In the great majority of the countries, the primary school teacher is a generalist in terms that he/she is responsible for teaching all subjects and he/she is all the day with the same class children, looking after them in both learning and health caring perspectives. This holistic view about children and children's growth is rather close to the health promotion approach, contrasting to the intense knowledge teaching required in secondary school, which is strongly based in the biomedical model.

The effect of the **level of teachers' training** in both conceptions of the biomedical model and health promotion was also investigated (question P5). Since only a few responders were included in code 1 (secondary education), this was amalgamated with code 2 (university 1-2 years). Thus, for the analysis we have four groups (Fig.2): P5.1. "secondary education + university 1-2 years"; P5.2. "university 3-4 years"; P5.3. "university 5-6 years" and P5.4. "longer education". Significant differences were found among groups (X^2 = 60.5, df = 4, p value = 2.2x10^{-12}), and Figure 2 shows that the higher the level of university (or high school) training the closer teachers are of the Health promotion approach.
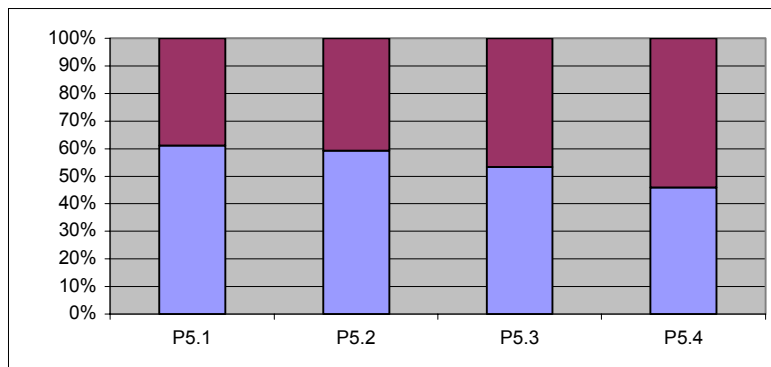
Figure 2. Percentage of BM (blue) and HP (pink) answers in each group of teachers' training level.
Numbers represent BM percentages.
P.5.1 - "secondary education + university 1-2 years";
P5.2. "university 3-4 years";
P5.3. "university 5-6 years";
P5.4. "longer education".

These results suggest that teachers' training contributes to make people to look at health education in a wider perspective than the narrow view of the biomedical model (Jones & Naidoo, 1997; Katz and Peberdy 1997; Ewles & Simnett, 1999; Carvalho, 2006; Carvalho & Carvalho, 2006).

We further analysed the effect of the responders' **childhood environment**, *i.e.* where teachers and future teachers lived in their infancy: question P14. "Rural countryside", "Town, small city", "Centre of a large city" and "Suburbs of a large city"). No significant differences were found between groups ($X^2 =$ 5.3, df = 3, *p* value = 0.148) indicating that the childhood environment is not relevant for the persons' perception about health education. This result reinforce the just above finding regarding the great importance of person's training to become more and more aware of the wide perspective of health education, i.e. towards health promotion perspective.

 "**Autocratic/Democratic**" is another important axis in Health Education (Carvalho & Carvalho 2005). In the present work we asked if "Only a strong central power can put some order in my country" (question A42) to be correlated to the Biomedical model and health promotion conceptions. The differences are significant ($X^2 =$ 25.9, df = 3, *p* value = $9.9x10^{-06}$) and results show that those responders that are for a central power (codes 1+2) are closer to the Biomedical model rather than the health promotion approach. This is an interesting expected result since the Biomedical model is characterised by the leadership of the health professionals whereas person's empowerment underpins the health promotion approach (Jones & Naidoo, 1997; Katz and Peberdy 1997; Ewles & Simnett, 1999; Carvalho, 2002, 2006; Carvalho & Carvalho, 2006).

3.2. Further analysis of Health education conceptions in 12 countries

Most of the Health Education questions were included in part B of the questionnaire. Only 12 countries applied both parts A and B of the questionnaire in a total of 5189 responders: Portugal (PT), France (FR), Italy (IT), Hungary (HU), Romania (RO), Estonia (ES), Finland (FI), Cyprus (CY), Senegal (SN), Morocco (MA), Tunisia (TN) and Lebanon (LB) (see "2. Methodology" for the number of responders per country).

The analysis carried out in this section concerns 4 questions of the questionnaire A (A55, A63, A67, A68) and 12 questions of the questionnaire B (B1, B2, B6, B9, B12, B15, B16,

B21, B22, B23, B25, B26) making a total of 16 questions, which were applied to 5189 individuals of the above 12 countries.

Figure 3 represents the between analysis on countries, where it is possible to see that axis F1 is strongly structured by the questions (by deceasing importance):

B26: *"Health education at school mainly involves developing the personal skills of pupils such as self esteem or stress management";*

B1: *"Health Education at school improves pupil behaviour";*

B22: *"Teachers should not be obliged to teach health education if they do not feel confident";*

B16: *"I should use olive oil more often in my food"*

Questions B26, B1 and B22 are related to school health education aims, which characterises the F1 axis.

The axis F2 is structured not only by the above B1 and B22, but also by the questions:

A63: *"Health can be seen in several perspectives. In the list below, tick the THREE expressions that you think are the most strongly associated with your personal view of health"* (analysed in detail in section 3.1. of this paper).

B25: *"I should eat more fresh vegetables".*

Charters (a) and (b) of Figure 3 show that Finland, Estonia and Hungary (and, in a lower degree, France Portugal and Italy) responders are against the idea that school health education should provide pupils' personal skills (B26) and against that improve pupils' behaviour (B1). In contrast, the non-European responders from Morocco, Lebanon and Tunisia (and, in a lower degree, Romania) are in favour of developing these pupils' skills.

At first sight, these are unexpected findings since several data have shown that the European countries, in particular the northern countries (Finland, Hungary, Estonia), have a traditional closer approach to health promotion (Carvalho et al., 2007), where the pupils' personal skills are being developed. These results deserve a further investigation to understand if these teachers' and future teachers' answers are associated to what it is really carried out in their country schools or, alternatively, it is what they think it should be done in contrast to what actually is being implemented in schools. This is to say that the responders of European countries (especially the northern ones) would like to see health education to include more biomedical information whereas the non-European responders would like to see more implementation of pupils' personal skills. This is a matter of further investigation.

The analysis of the responders' distribution concerning their religion (Figure 4) shows that it is again question B26, B1 and, at lower extent, question A63, which structure the axis F1. The second axis, F2, is less important.

Comparing charts (a) and (b) of both Figure 3 (Countries) and Figure 4 (Religions), it is possible to see, through the axis F1, that the distribution of the agnostic, Christians and others (Figure 4) are located close to the European countries whereas the Muslims are closer to non-European countries (Morroco, Lebanon and Tunisia).

The groups of countries obtained with the Religion effect (Figure 3) or without it (Figure 5) are quite similar, although showing some differences. In both Figures, Finland, Estonia and Hungary are opposite to the other countries (mainly due to questions A63 and B1), but without religion (Figure 5), a new opposition is emerging through the F1 axis with Mediterranean countries (Lebanon, Morocco and Cyprus) and Romania contrasting with

Senegal (Western Africa), mainly due to question B22 where Senegal is against *"Teachers should not be obliged to teach health education if they do not feel confident"* as well as against the idea of needing to eat more fresh vegetables (B25) and olive oil (B16). The other countries (Portugal, Italy, France and Tunisia) are in between these two groups of countries.

These results are in agreement with the above analysis on Section 3.1 of this paper where we had noticed that the effect of Countries on health education questions was stronger than the one of Religions.

Figure 3. Between analysis applied to *Countries.*

(a) and **(b)** show the position of the gravity centre of each country on the F1-F2 axis. In **(b)**, each point is a person, linked to the gravity centre his/her country. An ellipse is surrounding the 2/3 persons of each country. The name of countries may be sometimes hidden, but it can be read on **(a)** which shows the same information but enlarged.

(c) Answers to questions are represented by vectors, where the arrow corresponds to the higher code of the question (4 – "I disagree", see "2.Methodology"). The arrow position indicates the contribution of this question to each axis, by vector projection on either axis.

(d) Histogram of the eigenvalues, expressed as percentage of the variance of successive components. The two major components constitute the two axes of charts (a), (b) and (c).

Figure 4. Between analysis applied to *Religions.*

(a) and **(b)** show the position of the gravity centre of each religion on the F1-F2 axis. In **(b),** each point is a person, linked to the gravity centre his/her religion. An ellipse is surrounding the 2/3 persons of each religion. The name of religions may be sometimes hidden, but it can be read on (a) which shows the same information but enlarged. AGN = Agnostic, CHR = Christians, MUS = Muslims, ELS = Others / no answer.

(c) Answers to questions are represented by vectors, where the arrow corresponds to the higher code of the question (4 – "I disagree", see "2.Methodology"). The arrow position indicates the contribution of this question to each axis, by vector projection on either axis.

(d) Histogram of the eigenvalues, expressed as percentage of the variance of successive components. The two major components constitute the two axes of charts (a), (b) and (c).

The groups of countries obtained with the Religion effect (Figure 3) or without it (Figure 5) are quite similar, although showing some differences. In both Figures, Finland, Estonia and Hungary are opposite to the other countries (mainly due to questions A63 and B1), but without religion (Figure 5), a new opposition is emerging through the F1 axis with Mediterranean countries (Lebanon, Mo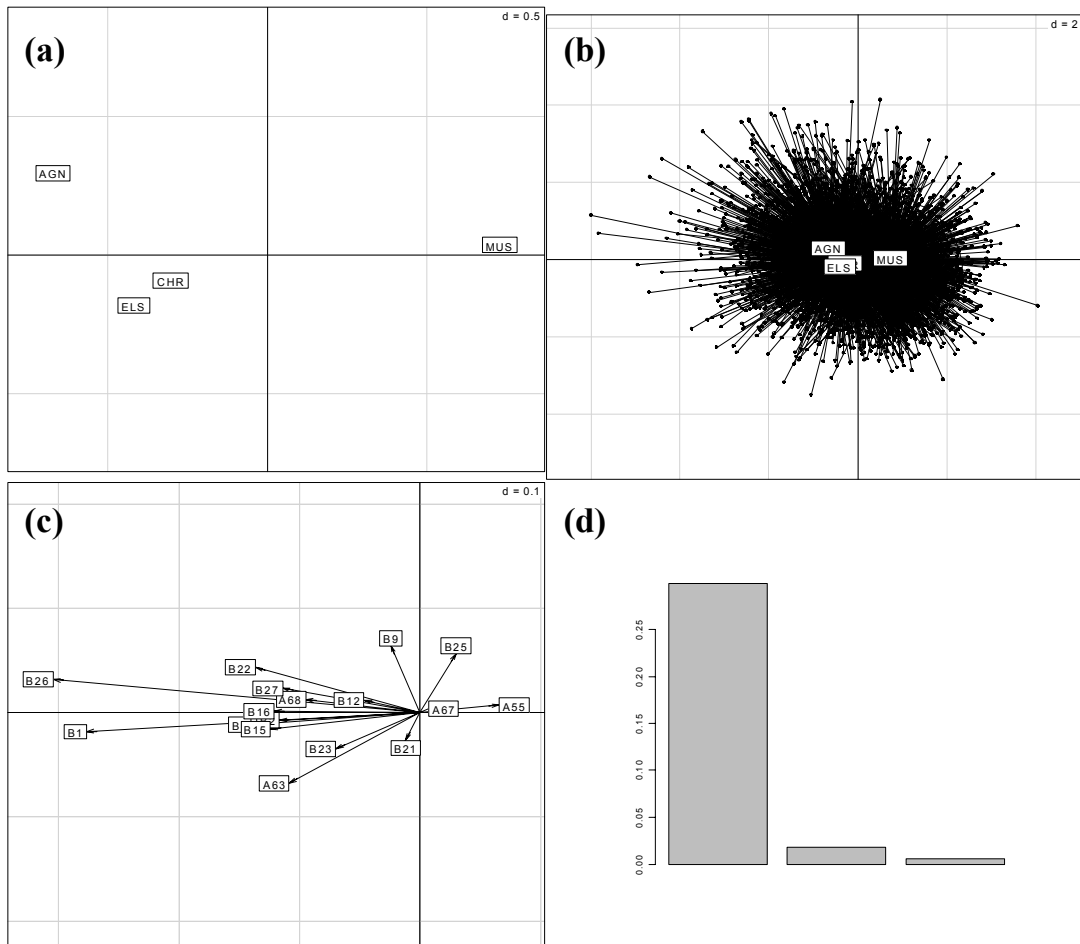rocco and Cyprus) and Romania contrasting with Senegal (Western Africa), mainly due to question B22 where Senegal is against *"Teachers should not be obliged to teach health education if they do not feel confident"* as well as against the idea of needing to eat more fresh vegetables (B25) and olive oil (B16). The other countries (Portugal, Italy, France and Tunisia) are in between these two groups of countries.

These results are in agreement with the above analysis on Section 3.1 of this paper where we had noticed that the effect of Countries on health education questions was stronger than the one of Religions.

Figure 5. Between analysis applied to *Countries* after suppression of the effect of the variable religion by orthogonal PCAVi.
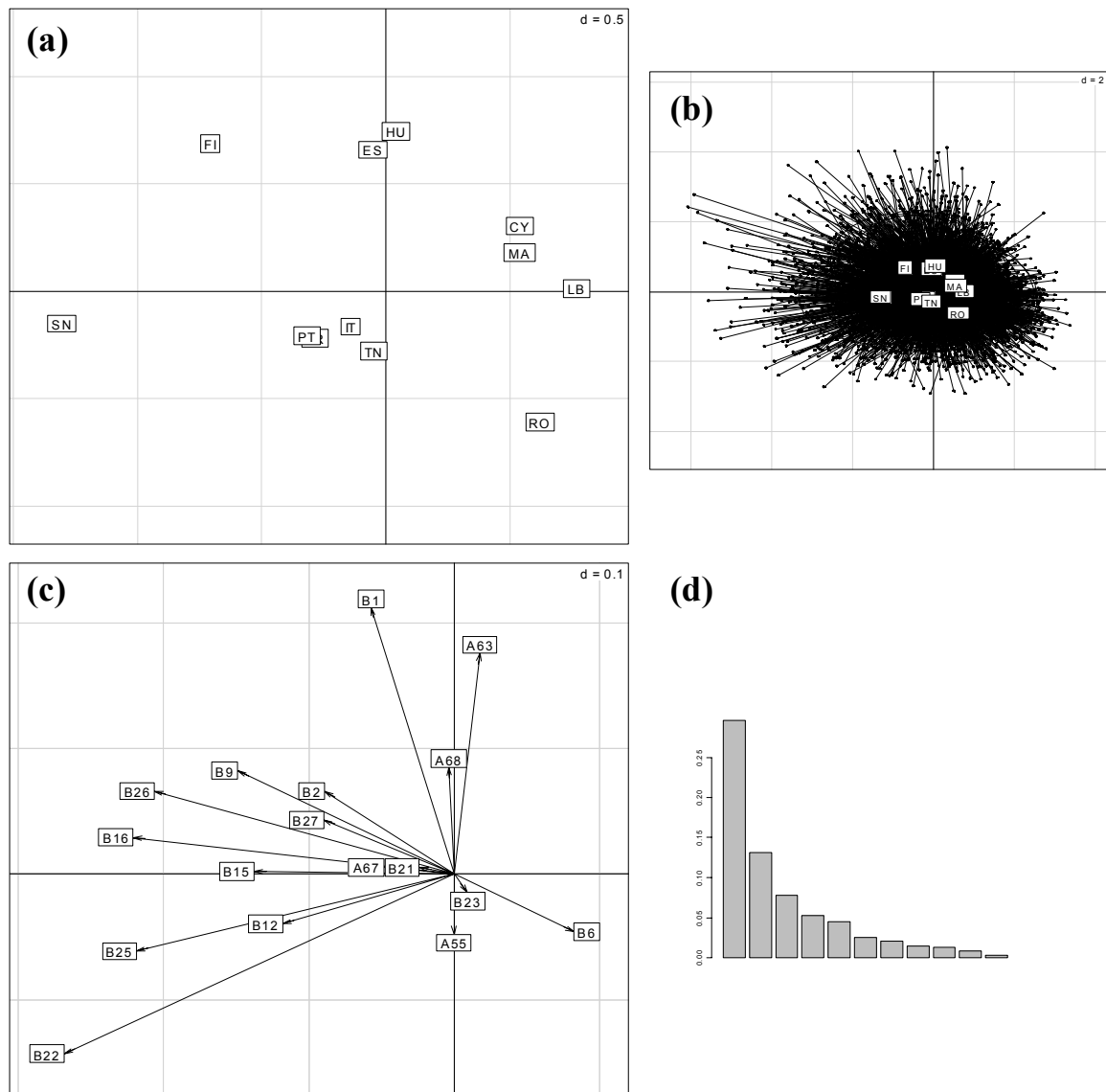
(a) and (b) show the position of the gravity centre of each country on the F1-F2 axis. In (b), each point is a person, linked to the gravity centre his/her Country. An ellipse is surrounding the 2/3 persons of each country. The name of countries may be sometimes hidden, but it can be read on (a) which shows the same information but enlarged.

(c) Answers to questions are represented by vectors, where the arrow corresponds to the higher code of the question (4 – "I disagree", see "2.Methodology"). The arrow position indicates the contribution of this question to each axis, by vector projection on either axis.

(d) Histogram of the eigenvalues, expressed as percentage of the variance of successive components. The two major components constitute the two axes of charts (a), (b) and (c).

Figure 6 represents the between analysis on groups of teachers, where it is possible to see that axis F1 is strongly structured by the following 4 questions, two related to implementing health education and the other two concerning healthy food:

B22: *"Teachers should not be obliged to teach health education if they do not feel confident"*;

B09: *"I would like to eat less meat"*;

B27: *"It is exclusively the family's responsibility to deal with health education"*;

B06: *"It would be good to put more fat in my food"*.

The F2 axis is structured by the following questions, one associated to policies and the other with the role of health education:

B23: *"Schools have to take into account public health policies"*;

B01: *"Health Education at school improves pupil behaviour"*.

All the in-service teachers of Primary school (InP), of Biology (InB) and of Language (InL) are clearly separated, along the Axis F1, from all pre-service teachers of Primary school, Biology and Language, respectively PreP, PreB and PreL. The results show that pre-teachers think that health education should be taught at school, not only by the families, and teachers should be obliged to teach even if they do not feel confident in doing it. In contrast, teachers with teaching experience are more defensive in this respect, assuming exactly the opposite.

The co-inertia analysis (Figure 7) allows optimising the correlations between differences in health education conceptions and the differences on political views. This correlation is maximal at the axis F1 (Figure 7-c). The main questions that structure this axis F1 are again (chart (a) of Figure):

B26: *"Health education at school mainly involves developing the personal skills of pupils such as self esteem or stress management"*;

B01: *"Health Education at school improves pupil behaviour"*;

B16: *"I should use olive oil more often in my food"*

B22: *"Teachers should not be obliged to teach health education if they do not feel confident"*;

B15: *"It is chiefly up to the school nurse and doctor to provide health education"*.

The chart (b) of this Figure 7 shows that this axis corresponds to the following political positions:

A34: *"The government must make laws favouring the creation of firms to stimulate our economy"*;

A42: *"Only a strong central power can put some order in my country"*.

And also:

A15: *"A priority of the government must be to guarantee resources for health protection of the poor"*;

A20: *"My government should compel all immigrants to learn to speak, to read and to write in (my state language)"*;

A48: *"Direct democracy (without government involvement) is the ideal solution to managing our society"*;

A51: *"Science and religion should be separated"*.

And at lower extent:

A26: *"There are too many foreigners in my country: the government should limit immigration"*;

A37: *"Religion and politics should be separated"*.
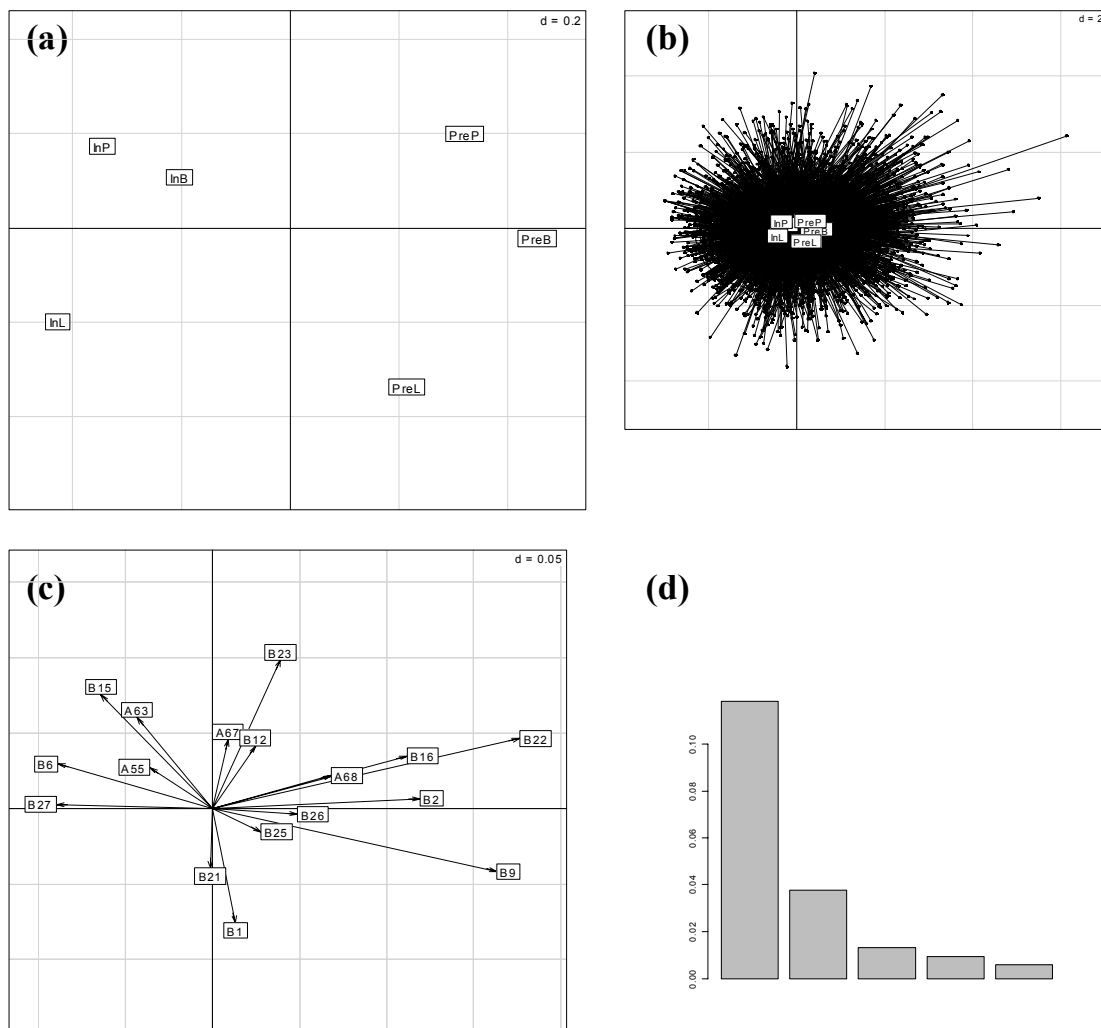
Figure 6. Between analysis applied to *Groups of teachers*.

(a) and (b) show the position of the gravity centre of each teachers' group on the F1-F2 axis. In (b), each point is a person, linked to the gravity centre of his/her teachers' group. An ellipse is surrounding the 2/3 persons of each teachers' group. The name of teachers' groups may be sometimes hidden, but it can be read on (a) which shows the same information but enlarged. InP = In-service Primary school teachers; InB = In-service Biology teachers; InL = In-service Language teachers; PreP = Pre-service Primary school teachers; PreB = Pre-service Biology teachers; Pre-L = Pre-service Language teachers.

(c) Answers to questions are represented by vectors, where the arrow corresponds to the higher code of the question (4 – "I disagree", see "2.Methodology"). The arrow position indicates the contribution of this question to each axis, by vector projection on either axis.

In contrast, the questions concerning involvements in environmental protection (Envtinv1, Envtinv2, Envtinv3) almost do not participate in structuring this axis F1, indicating that they are not associated to health education, which is in coherence to the biomedical model, but not with the health promotion approach.

For example the critical questions concerning Health Education in school where teachers "do not agree" (B26, B1, B22, B15, A63) correspond to an equivalent political point of view of "do not agree" with: *"Only a strong central power can put some order in my country"* (A42), *"The government must make laws favouring the creation of firms to stimulate our economy"* (A34). This expresses some coherence in critical political positions (against a

strong power, against the protection of enterprises by the government, etc.) without having, however, anarchist positions (A48).
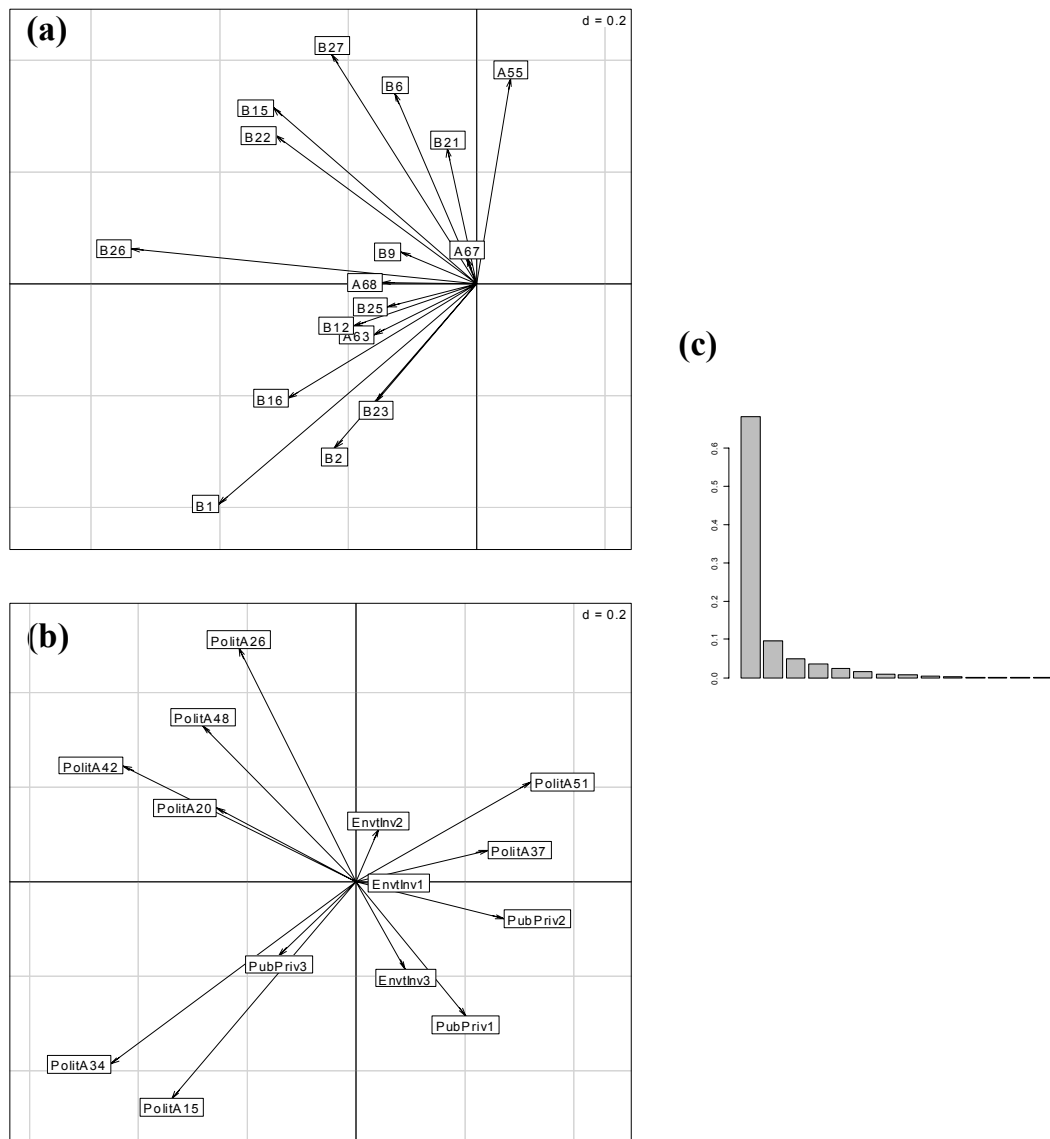
Figure 7. Co-inertia analysis applied to *Health education variables* (a) and to *Political variables* (b).

In addition, Axis F2 shows views of high social policies and political solidarity (A26, A15, A20). This coherence between political/social positions and conceptions on health promotion is very interesting. For example, the group of countries (Finland, Estonia and Hungary) are, in this study, well characterised by their progressist political positions which also corresponds to their position towards the health promotion approach.

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Annex
Questions used in this work

A55. In your opinion, the main goal of health education in school should be (tick only **ONE** of the four boxes)**:**

Providing knowledge ☐ ☐ ☐ ☐ Developing behaviour that is respectful of one's own health

A63. **Health can be seen in several perspectives. In the list below, tick the THREE expressions that you think are the most strongly associated with your** *personal view of health:*
- ☐ Not suffering from any serious disease.
- ☐ Feeling at peace with myself.
- ☐ Enjoying my life without feeling too much stress.
- ☐ Having my body components working well.
- ☐ Being in good condition to be socially active.
- ☐ Having no need to see a doctor, for treatment.

A67. **We must keep the air-pollution in cities under control because** (tick only **ONE** statement that you personally consider to be the most important)** :**
- ☐ the homes of citizens who live close to streets will be polluted.
- ☐ legislation defines maximum levels of air-pollution.
- ☐ inhaling poisonous gases causes illnesses.
- ☐ health costs are increased because air pollution.

A68. **If possible, we should walk more instead of using cars because** (tick only **ONE** statement that you personally consider to be the most important)** :**
- ☐ this may save the money that we spend on cars.
- ☐ by doing this we get to feel better.
- ☐ by this way we keep air cleaner for everybody.
- ☐ we are fed up with driving and parking rules.

B1.	Health Education at school improves pupil behaviour.	I agree				I don't agree
B2.	I would like to eat fish more often.	I agree				I don't agree
B6.	It would be good to put more fat in my food.	I agree				I don't agree
B9.	I would like to eat less meat.	I agree				I don't agree
B12.	I would like to eat more fruit.	I agree				I don't agree
B15.	It is chiefly up to the school nurse and doctor to provide health education.	I agree				I don't agree
B16.	I should use olive oil more often in my food.	I agree				I don't agree
B21.	Health education at school must be restricted to providing scientific information (diet, sleeping cycle, drug risk).	I agree				I don't agree
B22.	Teachers should not be obliged to teach health education if they do not feel confident.	I agree				I don't agree
B23.	Schools have to take into account public health policies.	I agree				I don't agree
B24.	Psychological and social aspects of sex education should be taught primarily by health professionals (doctor, nurse).	I agree				I don't agree
B25.	I should eat more fresh vegetables.	I agree				I don't agree
B26.	Health education at school mainly involves developing the personal skills of pupils such as self esteem or stress management.	I agree				I don't agree
B27.	It is exclusively the family's responsibility to deal with health education.	I agree				I don't agree

P1. You are: (to be adapted by each team)

☐ A Student training to become a Primary School teacher (pupils less than 11-12 years old)

☐ A Student training to become a Secondary School teacher (students from 12 years old to 18 years old)

☐ An in-service Primary School teacher

☐ An in-service Secondary School teacher

If you are at the Secondary level, what subject matter do you teach: ☐ Biology only   ☐ Biology and other

☐ National Language ☐ National Language and other

☐ Other (specify): _____

P5. What is your highest level of education?

☐ Secondary education   ☐ University 1-2 years   ☐ 3-4 years   ☐ 5-6 years
☐ longer (specify) _____

P12. (Tick one box in **EACH** line):

I believe in God					I don't believe in God
I practise religion					I do not practise religion

P13. **Are you?** (tick only **ONE** box):
  ☐ Agnostic/Atheist
  Christian: ☐ Catholic   ☐ Protestant   ☐ Orthodox   ☐ Other (specify): _____
  Moslem: ☐ Sunnite   ☐ Shiite   ☐ Druze   ☐ Other (specify): _____
  ☐ Jewish
  ☐ Other religion/belief (specify): _____
  ☐ I don't want to answer

P14. **In which kind of environment did you spend most of your childhood?**
  ☐ Rural countryside   ☐ Town, small city   ☐ Centre of a large city   ☐ Suburbs of a large city