Physical Education as a tool for developing health and social skills: Results of a pilot study in South Africa and Sweden

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Abstract

A cooperation project on school physical education (PE) was established between the Tshwane University of Technology, Pretoria, South Africa and the University of Gothenburg, Sweden. The project was funded as part of the international cooperation agreement between South Africa and Sweden. The aim of the project was to investigate discrepancies between intended subscription and actual provision for PE/Life Orientation (LO) in Swedish and South African schools. Presented in this paper are results of the pilot study on the comparative research project which focused on PE as a tool for developing health and social skills among Swedish and South African school children. A major objective of the project was to investigate how provision for PE is defined in formal school settings in both countries. To answer the question we constructed a 23-item questionnaire measuring PE provision and children's attitudes towards the subject in primary and lower secondary schools. A questionnaire was constructed utilizing a) participant observations of lessons in Sweden and South Africa, b) semi-structured interviews with school principals and PE teachers in both countries, and c) analyses of policy documents in each country. The pilot instrument consisted of four batteries of questions: a) Health promotion (8 items), b) Social development (8 items), c) Personal development (10 items), and d) Physical development and movement (6 items). The questionnaire was developed in two almost identical versions and was completed by primary school pupils in South Africa (n =105) and Sweden (n = 42). In order to improve the reliability and the construct validity of the questionnaire we modified the pilot versions of the questionnaire eliminating poorly fit items using various statistical techniques. Pupils' answers to the questionnaire were analyzed mainly through structural equation modeling techniques (AMOS). This technique facilitates the simultaneous analysis of the robustness of the whole instrument and the test of each battery of questions. The statistical analyses were aimed at designing a questionnaire with very good fit indices for Swedish and South African contexts. Results yielded substantial Cronbach's α: whole instrument (α=.84); Health promotion (α=60), Social development (α=60), Personal development (α=79), Physical development (α=76), which showed acceptable reliability estimates for the questionnaire subscales.

Key words: Physical Education, health, social skills, quality issues, policy.

Introduction

Developments in Physical Education (PE) from pre-historic, historic and modern times (21st Century) show diverse emphases. PE's contributions to the many facets of human development have been tremendous, to say the least. There is no controversy regarding the values of PE as these have been acknowledged world-wide. The overwhelming support enjoyed by the discipline has, however, decreased towards the end of the last century in many countries. These setbacks, among others, include a cut back in the funding (budget), reduction of time on the school timetable as well as complete removal from the curriculum in some cases to allow more time and space for the other "more important" school subjects (Hardman & Marshall, 2000). The need to justify itself and its existence among other subjects has led to some changes e.g. in names,

syllabi and foci. Many countries are now redirecting their PE curricular and syllabi to focus on areas such as health, physical activities (instead of sport) and a great deal of latitude is permitted in decision making by learners, characterized by a shift of emphasis from being less prescriptive to allowing a greater discretion in delivery, flexibility and students' freedom of choice, development of active choices (as opposed to sedentary positions like television games), health and life-style and behavior modifications. In other words, a paradigm shift from more promotion and acquisition of motor and sport skills to reflective action and insight into health issues and promotion of good health is gradually being witnessed. A learner should be able to participate, gather experiences as well as develop holistically irrespective of his/her conditions, as well as understand the relationship between physical activity and health. This view is shared by Annerstedt, Eriksson, Patriksson and Stråhlman (2008: 432) who stated:

> "PE in school is not so much about teaching and learning different sports. Sports should function more as a means to develop other personal traits, e.g. ability and desire to move and develop a sense of community through rhythm and movement."

The status and focus of PE world-wide varies depending on several factors such as the economy, educational objectives and personnel. In South Africa, the previous apartheid government favoured structured PE only among white institutions. A gulf of difference therefore exists between white and black institutions of learning regarding PE.

Towards the end of the last century developments in both South Africa and Sweden show that some transformations have taken place. After attaining independence in 1994, the PE curriculum in the South African education system was redesigned to address emerging national values and ideals of post independent South Africa. Some changes were also introduced to some aspects of PE to form a section of Life Orientation (LO) (Department of Education, 2005). Some changes also took place in Sweden. An example is the change of PE to PE and health (Patriksson & Stråhlman, 2006). These changes indicate political as well as educational mentalities in the two countries. It is also obvious that the South African and Swedish governments value socialization through sports and sports for health, respectively. This should not however, be construed to mean that there are no discrepancies in the central objectives, actual delivery and practices of PE in the two countries. Common issues and challenges include (but not limited to) lack of adequate time for PE at schools, domination of ball games during PE lessons, drastic cut back in the budget for PE, poorly qualified personnel and inadequate space among others. These challenges are regrettable in view of available scientific evidence which confirms the role of PE in promoting children's health, growth and development (Talbot, 2001) as well as improving physical, mental and metabolic fitness (Malina, 2001).

The consequences of a general decline in the teaching of PE are not only observed in developing countries, but also in the developed world. In the last decade many studies carried out around the world have consistently reported an increasing prevalence of childhood over-weight and obesity which aid predisposition to cardiovascular disease, hypertension and diabetes. Examples of such studies are those conducted in United Arab Emirates (Al-Haddad et al., 2005), Greece (Krekoukia et al., 2006), USA (Stallmann-Jorgensen et al., 2007), India (Rao, Kanade & Kelkar, 2007) and Sudan (Salih & Abel-Haziz, 2007). In Sweden an increasing prevalence of overweight and obese individuals has been reported during the last decade (Patriksson & Stählman, 2006).

A number of international multicentre studies such as the CASPIAN Study (Kelishadi et al., 2006) and the European Youth Heart Study (2008) have all consistently shown positive correlations between over-weight and adverse lipid profiles, high insulin levels and hypertension in children. In South Africa, studies carried out on Ellisras children (Monyeki et al., 2005) and on Tshannda rural children (Amusa et al., 2007) in the Limpopo Province, have also shown an increased prevalence of risk factors of metabolic diseases associated with physical inactivity among rural school children. The increasing trend of physical inactivity among children is further exacerbated by their exposure to modern technological devises such as television, computer games, video games, mobile phones, Internet, access to fast foods rich in saturated fats and the fact that children are often driven to schools nowadays as opposed to walking or cycling. These trends are typical of the two developing economies (South Africa and Sweden) in this study.

There are currently ongoing worldwide debates on how to solve the problems of physical inactivity through PE, particularly among the youth. These debates target several issues including definition of quality teaching of PE (Hardman & Marshall, 2000), holistic education and excluded groups of children (Patriksson & Stråhlman, 2006). Discussions on holistic education highlight the importance of "Life-skills or general skills "versus" intellectual skills". Central problems regarding excluded children are often considered to be interrupted schooling and issues connected with socially constructed roles.

In order to address the afore-mentioned issues in the two countries, several questions are posed:

- How is the subscribed quality of PE defined in the curriculum of the two countries?
- How is provision of quality PE perceived by stake-holders such as PE teachers, school principals and education officers?
- What are the discrepancies between intentions and actual provision for PE?
- Which are the sources that cause or steer the transformation process in terms of constitutional (policy documents), organizational (allocated time) and physical (facilities and equipment) frames?
- What is the actual product of PE perceived by children as learners at the lower echelon of the education system?
- Does this product form the basis of the empowerment of the individual leading to upgraded social skills and to the development of healthy lifestyles?

Answers to these questions are expected to produce not only detailed recommendations but also complete proposals on a more holistic central curriculum for PE in the two countries. The findings of this study could assist in generating suitable guidelines that can help local schools to formulate theoretically and practically informed local syllabuses, outline suggestions related to the incorporation of specific skills in PE Teacher Education programme and facilitate the provision of in-service training courses for PE teachers in the two countries.

This study is therefore designed to achieve the following objectives:

1. To develop and validate a model for assessing the quality of PE as a tool for developing public health and social skills among school children in South Africa and Sweden.

2. To assess how quality Physical Education is defined in South African and Swedish schools based on the two versions of policy documents of the two countries.
3. To determine the emerging patterns and discrepancies in PE based on government intentions and actual provision in the two countries.
4. To assess how PE has been and could be used to target the important social, health-related and knowledge skills among school children in the two countries.
5. To assess the patterns of social exclusion during physical education lessons in each country with a view to determining which groups of pupils are perceived as different.

Presented in this report are the results of the pilot study of a comparative project on PE as a tool for developing health and social skills among pupils in Swedish and South African schools. One of the main objectives of the project, i.e. to investigate how PE provision as defined in school settings, is addressed in this study. This necessitated the construction of a questionnaire measuring provision for PE in primary and lower secondary schools in both countries. In this study, development and pilot testing of the questionnaire are outlined as well as the refinement of the questionnaire used in the main study.

Method

Sample

A total of 147 pupils attending three and two primary schools in South Africa (n = 105) and Sweden (n = 42 pupils), respectively participated in the pilot study. They were aged 9-13 years. The school principals and/or PE teachers in the schools were interviewed concerning statutory provision of teaching and learning resources for PE in the schools.

Instrument and procedures

A 32-item questionnaire (Appendix I) was developed utilizing (a) participant observations of PE lessons in Sweden and South Africa, (b) semi-structured interviews with school principals and Physical Education teachers in both countries, and (c) analyses of policy documents in each country (Department of Education, 2005; Skolverket, 2000, 2006). The pilot questionnaire[#] consisted of four batteries of questions: (a). Health promotion (8 items), (b) Social development (8 items), (c) Personal development (10 items), and (d) Physical development and movement (6 items). The 5-point Likert-scale questionnaire was designed in two almost identical versions for use in Sweden and South Africa.

After due permission was obtained from principals of the schools, the children were assembled in a classroom there they completed the questionnaire at two weeks interval. In order to ensure that the questionnaires were filled correctly, item-by-item explanation of the questionnaire was given to the pupils.

Ethical considerations

Before data collection the purpose and procedures of the study were explained to the school principals who granted permission for the research to be carried out. The research proposal was

[#]Only the results of the learners' questionnaire are presented in this report.

also approved by the South African National Research Foundation (NRF) and Swedish Research Council.

Data analysis

To confirm the reliability and the construct validity of the questionnaire, data analysis was done utilizing structural equation modeling techniques with Amos (Byrne, 2001). The reliability of the total scale using the entire sample in both Sweden and South Africa was .84. The unique alphas in each country were .88 and .79, respectively. For all analysis a probability level of 0.05 or less was used to indicate statistical significance.

Results and Discussion

Health promotion

Lifestyle choices and their effects on health are focused in the South African and the Swedish PE/LO curricula. More specifically, sound health practices as well as an understanding of the relationships between the pupils' health and selected behaviors are highlighted. However, the specific situation in each country is signified as disease prevention in South Africa and as personal responsibility in Sweden. In this study, health promotion was measured with eight items (see Appendix 1) connected to scheduled meals (H11A), breakfast (H11B), personal hygiene (H12A), perception and attitudes towards health (H12B, H14B) and lifestyle issues (H13A, H13B, H14A).

Descriptive estimates on pupils´ answers as well as measures related to a first order model on health promotion can be seen in Table 1.

Table 1: Health Promotion

	Samples		First Order Model						
	Means & Standard Deviations		Descriptives					Fit Indexes	
	South Africa	Sweden	Mean	Skewness	Kurtosis	SRW	SE		
H11A	3.75 (1.22)	2.83 (1.24)	3.49	-.48	-.68	.21	.10	Chi-sq	43.08
H11B	4.17 (1.20)	4.50 (.92)	4.27	-1.35	.41	.11	.13	Df	20
H12A	4.25 (1.05)	4.37 (.97)	4.28	-1.41	1.42	.36	.14	RMSEA	.08
H12B	4.56 (.72)	4.14 (.93)	4.44	-1.38	1.60	.69	.13	GFI	.93
H13A	3.77 (1.16)	3.32 (.96)	3.64	-.52	-.49	.44	.14	CFI	.75
H13B	3.19 (1.18)	2.56 (1.34)	3.01	.06	-1.08	.14	.13	TLI	.66
H14A	2.21 (1.04)	2.12 (.84)	2.18	.50	-.34	.09	.11		
H14B	4.61 (.67)	4.12 (.94)	4.47	-1.47	2.03	.69	21.8		

Note. GFI = Goodness of Fit Index, RMSEA = Root Mean Square Error of Approximation, Df= Degrees of freedom, CFI=Comparative Fit Index, TLI=Tucker-Lewis Index, SRW=Standardized Regression Weights, SE=Standard Error.

The first order model bonds the eight questions into a structure representing health promotion constitutes a statistically accepted solution (see Appendix II, variance and covariance matrices). However, fit indices indicate a reasonable error[1] (Byrne, 2001) stressing the importance of improving the subset of questions.

[1]According to Byrne (2001) the quality of a structural equation model can be characterized as perfect fit, close fit, with reasonable errors and rejected. It means the models usually have reasonable errors in the initial phase of a research.

Social development

Enabling learners to form positive social relationships and promotion of social ability are expected educational outcomes in South Africa and Sweden, respectively. It seems however, that socialization is more broadly defined within the context of LO in South Africa, while socialization within sport environment is obvious in the Swedish context. In this study, social development has been measured utilizing eight items (see Appendix 1) connected to pupils' ability to relate with an authority e.g. PE teacher (S21A, S21B), with other pupils (S22A, S23A, S24A), as well as to issues of equity, justice and respect (S22B, S25A, S25B). Descriptive estimates on pupils´ answers as well as measures related to a first order model on social development can be seen in Table 2.

Table 2: Social Development

	Samples		First Order Model						
	Means & Standard Deviations		Descriptives					Fit Indexes	
	South Africa	Sweden	Mean	Skewness	Kurtosis	SRW	SE		
S21A	3.47 (1.09)	3.68 (.88)	3.53	.74	.29	.49	.15	Chi-sq	55.88
S21B	4.12 (.98	3.66 (1.13)	3.99	-.79	-.09	.70	3.40	Df	20
S22A	3.84 (1.26)	4.15 (1.01)	3.92	-.97	.05	.28	.12	RMSEA	.11
S22B	3.74 (1.25)	3.95 (1.07)	3.80	-.81	-.17	.38	1.16	GFI	.91
S23A	3.24 (1.21)	4.38 (.84)	3.56	-.45	-.75	.01	.13	CFI	.60
S24A	3.13 (1.37)	3.70 (1.24)	3.28	-.13	-1.08	.11	.11	TLI	.44
S25A	4.01 (1.12)	4.00 (.84)	4.01	-1.05	.70	.36	.23		
S25B	4.27 (1.03)	4.07 (82)	4.21	-1.18	.78	.35	.18		

Note. GFI = Goodness of Fit Index, RMSEA = Root Mean Square Error of Approximation, Df= Degrees of freedom, CFI=Comparative Fit Index, TLI=Tucker-Lewis Index, SRW=Standardized Regression Weights, SE=Standard Error.

In Table 2, the eight items can be represented by a first order model (see also Appendix II, variance and covariance matrices). However, fit indices indicate once again a reasonable error (Byrne, 2001) stressing the importance of improving the questions in this subscale.

Personal development

A major thrust of the South African curriculum is to empower learners to achieve their personal potential (Department of Education, 2005). Issues of personal development in terms of establishing personal views and standpoints to consciously choose a physically active lifestyle are discussed in the Swedish policy text. In the questionnaire, personal development was assessed using ten items (see Appendix 1) which ranged from PE teachers' ability to create a conducive climate for personal development for pupils (P31A, P31B, P32A, P32B), to pupils' ability to cope with school factors (P33A, P33B, P34A, P34B) and to form inspiring relations with teachers and other pupils. Descriptive data of pupils´ responses as well as measures related to a first order model on personal development are provided in Table 3. Responses to the ten items when analysed reflected first order model with fit indices showing reasonable error thus requiring refinement of the subscale (see also Appendix II, variance and covariance matrices).

Physical development and movement

Physical development and movement seem to be the essence of PE. However, the fact that PE is within the framework of LO in South Africa and is directly related to health in Sweden contributes to the uniqueness of each national context.

In the pilot study, six items were considered as reflecting attributes of physical development and movement (see Appendix 1). These included actual participation in sports and games (M42B, M43A), pupils' attitudes towards sports and games (M41A, M42A) and pupils' perception of their own participation in and understanding of sports and games (M41B, M43B).

Table 3: Personal Development

	Samples		First Order Model						
	Means & Standard Deviations		Descriptives					Fit Indexes	
	South Africa	Sweden	Mean	Skewness	Kurtosis	SRW	SE		
P31A	3.89 (.99)	3.67 (.98)	3.82	-.57	.08	.46	.10	Chi-sq	123.56
P31B	3.80 (.93)	3.64 (1.01)	3.75	-.31	-.40	.60	.10	Df	35
P32A	3.90 (.99)	3.39 (1.20)	3.76	-.78	.35	.61	.09	RMSEA	.13
P32B	3.51 (1.10)	3.45 (1.17)	3.50	-.44	-.37	.55	.10	GFI	.83
P33A	4.25 (.95)	4.02 (1.02)	4.19	-.85	-.33	.36	.11	CFI	.73
P33B	4.77 (.56)	4.12 (1.04)	4.58	-2.22	5.52	.46	.16	TLI	.66
P34A	4.28 (.84)	3.17 (1.00)	3.96	-.69	-.13	.51	.08		
P34B	4.30 (.96)	3.48 (1.25)	4.06	-1.09	.46	.71	.08		
P35A	4.23 (1.15)	3.46 (1.34)	4.01	-1.10	.07	.43	.12		
P35B	4.42 (.78)	3.98 (1.17)	4.29	-1.41	1.71	.49	.13		

Note. GFI = Goodness of Fit Index, RMSEA = Root Mean Square Error of Approximation, Df= Degrees of freedom, CFI=Comparative Fit Index, TLI=Tucker-Lewis Index, SRW=Standardized Regression Weights, SE=Standard Error.

Descriptive estimates on pupils´ responses as well as measures related to a first order model on physical development and movement are presented in Table 4.

Table 4: Physical Development and Movement

	Samples		First Order Model						
	Means & Standard Deviations		Descriptives					Fit Indexes	
	South Africa	Sweden	Mean	Skewness	Kurtosis	SRW	SE		
M41A	3.63 (.80)	3.64 (1.16)	3.64	-.69	.53	.89	.04	Chi-sq	65.30
M41B	4.32 (.87)	3.33 (1.14)	4.03	-.97	.45	.38	.18	Df	9
M42A	3.70 (.89)	3.67 (1.11)	3.69	-.55	.01	.85	.05	RMSEA	.20
M42B	4.32 (.89)	3.55 (1.45)	4.10	-1.29	.88	.53	.09	GFI	.86
M43A	3.36 (1.22)	3.05 (.49)	3.27	-.36	-.21	.20	.10	CFI	.79
M43B	4.22 (.89)	4.10 (.93)	4.18	-1.01	.88	.45	.09	TLI	.66

Note. GFI = Goodness of Fit Index, RMSEA = Root Mean Square Error of Approximation, Df= Degrees of freedom, CFI=Comparative Fit Index, TLI=Tucker-Lewis Index, SRW=Standardized Regression Weights, SE=Standard Error.

With reference to Table 4, the six items form a first order model connected to physical development and health. On the basis of the fit indices that display reasonable error a further

development of the subscale was undertaken (see also Appendix II, variance and covariance matrices).

Physical development and movement

The four first order models connected to health promotion, social development, personal development as well as physical development and health constitute an accepted model solution as the minimum fit is established. The minimum fit on one hand and the high reasonable error estimates on the other hand can be explained with the restricted sample and validity issues in mind. To improve the validity of the subscales as well as to provide a model with more robust fit indices, a process involving second order modeling was followed. Firstly, a second order model with all the four subscales was constructed. This model depicts PE as composed of health promotion, social development, personal development as well as physical development and health (Figure 1). The PE second order model shows acceptable fit indexes indicating reasonable errors (Byrne, 2001).

To refine the model specific items from each subscale were eliminated to upgrade fit indices. The procedure resulted in a 23-item questionnaire with a good robustness and indices which showed close fit (Figure 2). As it can be seen in Table 5, the main study model (23-item questionnaire) is more robust than the pilot study model (32-item questionnaire) as improvements have been made not only in terms of statistical power but also in terms of upgrading the fit indices from .01 to .13 points.

Table 5: Physical Education Provision model: Explorative Analysis

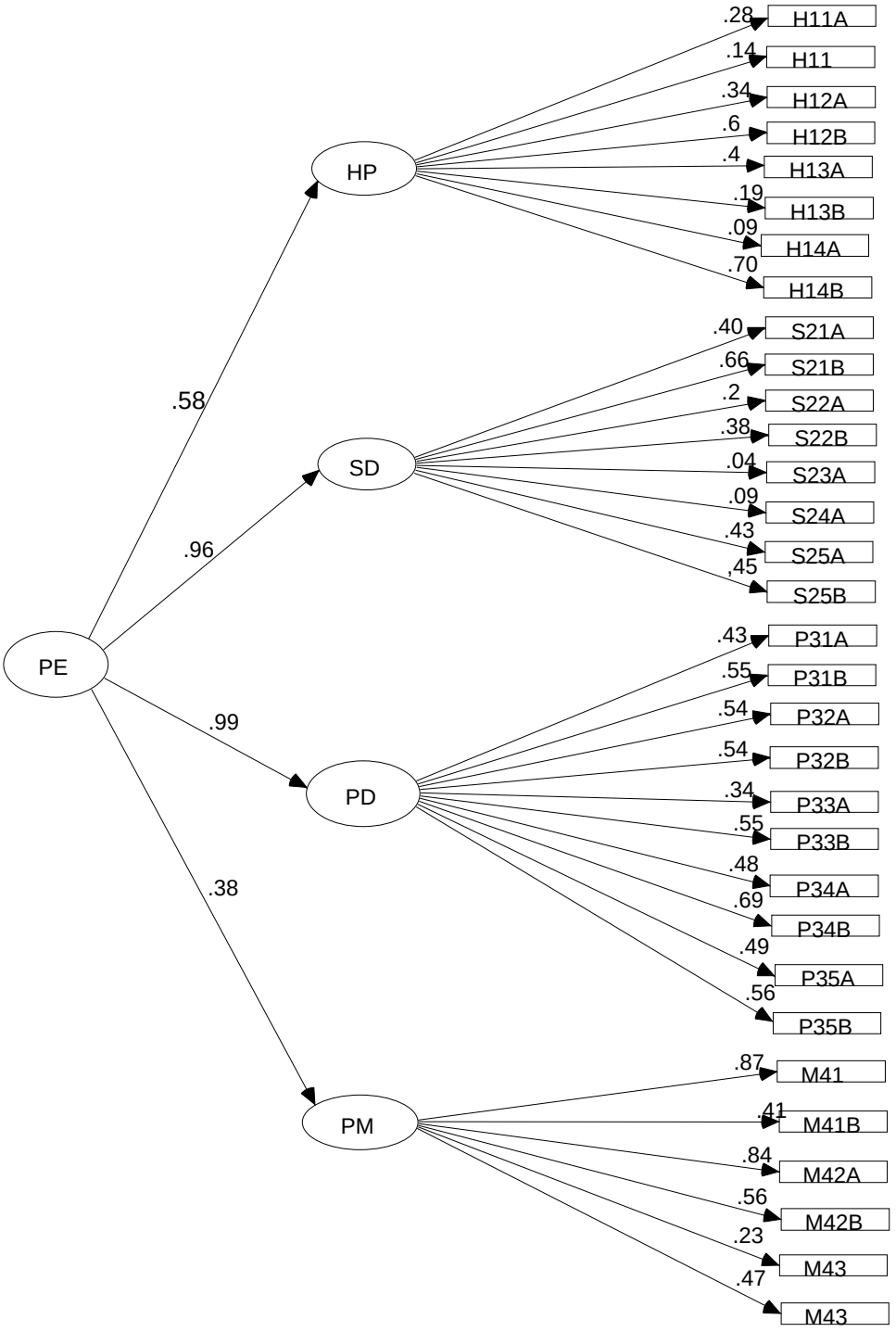
Model	X^2	Df	X^2 / Df	GFI	AGFI	RMSEA	TLI	CFI	PNFI
A. Pilot Study model	936.5*	460	2.04	.69	.64	.08	.57	.60	.41
B. Main study model	480.5*	226	2.13	.78	.73	.07	.64	.67	.48
Difference A & B	456.0*	236	0.90	.09	.09	.01	.13	.07	.07

* p>.001. Note. Df=Degrees of freedom, GFI = Goodness of Fit Index, AGFI=Adjusted GFI, RMSEA = Root Mean Square Error of Approximation, TLI= Tucker-Lewis Index, CFI = Comparative Fit Index, PNFI = Parsimonious Normed Fit Index

According to the LO learning area, health promotion, social development, personal development as well as physical development and movement constitute important outcomes in the South African school system (Department of Education, 2005). In Sweden the school subjects of sports and health target similar goals as in South Africa, taking each nation's uniqueness into account (Skolverket, 2000). To highlight authentic provision for PE in the two countries the pilot questionnaire was designed to consist of four subsets of questions to measure the learning outcomes, i.e. health promotion, social development, personal development as well as physical development and movement.

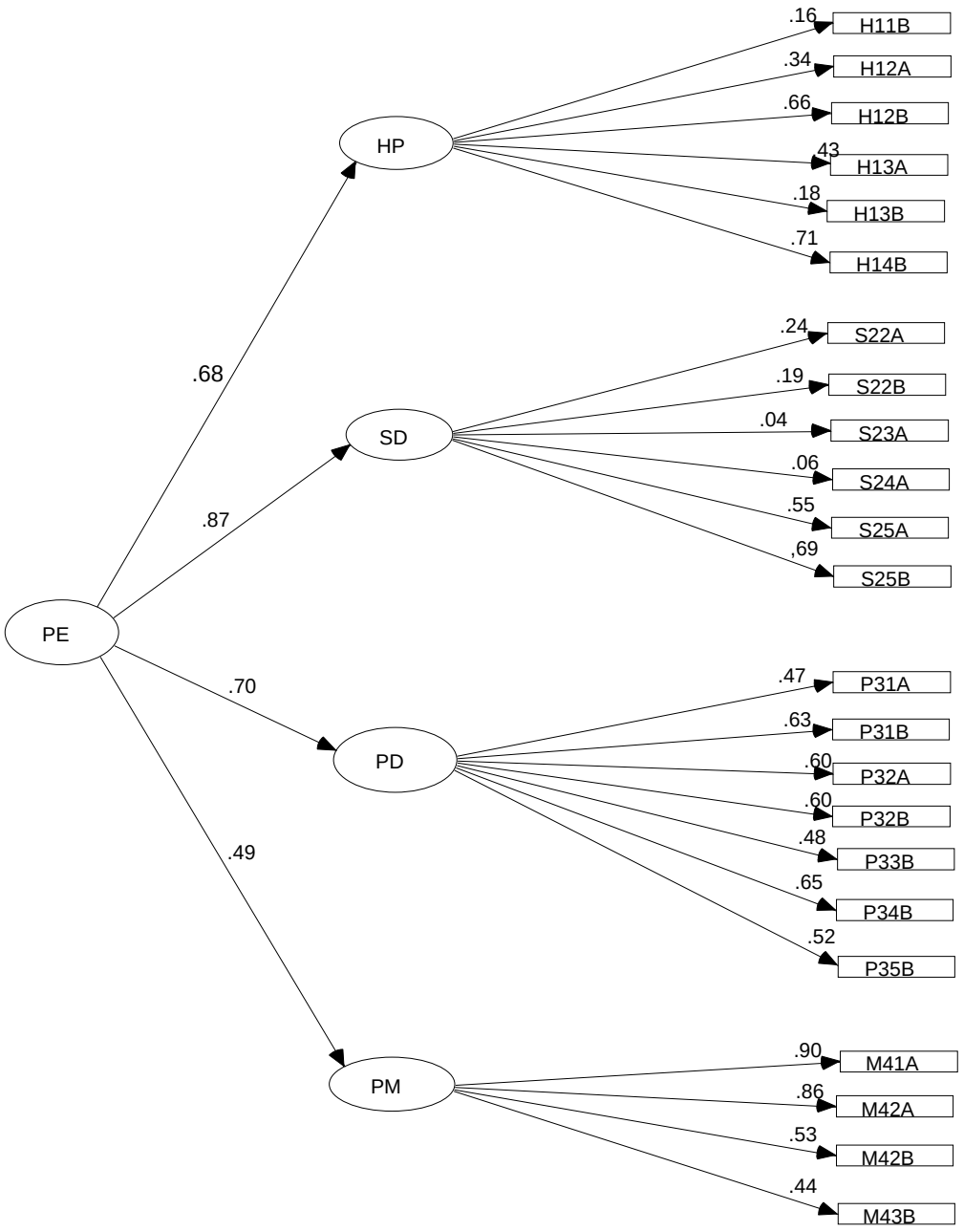
The subscales all showed acceptable robustness and validity within reasonable frame of error. Further analysis indicated a second order model which measured PE as a multidimensional construct with accepted fit indices as well. To reduce error interference, the second order model was refined by eliminating poorly fit items within the subscales. The refined second order model

appears to be much more robust than the first one as several fit indices indicate a close fit. This eventually reduced the instrument to 23 items which was regarded as usable for data collection in the main study in Sweden and South Africa.



Note. HP = Health Promotion, SD = Social Development, PD = Personal Development, PM= Physical development & Movement

Figure 1. Physical Education (PE): A multidimensional construct



Note. HP = Health Promotion, SD = Social Development, PD = Personal Development, PM= Physical development & Movement

Figure 2. The refined questionnaire.

Limitation

Since this research was carried out in Sweden and South Africa, it was necessary to develop a questionnaire in English which was translated to Swedish. In order to ensure that the questionnaire items were accurately interpreted, a back translation procedure of the original

English version of the instrument was undertaken by one of the authors (GP) who is a native speaker of the Swedish language. In spite of this precaution it is possible that errors could arise in translating the questionnaire to Swedish. This limitation should be considered in interpreting the results of the study.

Implications for Further Research

The instrument developed and refined in the pilot study will be used to collect data in the actual study which will involve a total of 2 500 Swedish and 7 500 South African pupils. It is envisaged that the outcome of the main study will address the issues raised at the beginning of the research and provide data that will guide the formulation of educational policies needed to promote the quality of PE/LO in South African and Swedish schools. Ample data will also be obtained which will facilitate comparative analysis of the South African and Swedish children's responses to the questionnaire subscales. Implications of the findings to the children's health and wellness will also be analysed.

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Appendix I: The initial 32-item Questionnaire

Items	Questions	Values
H11A	Have ever tried to make a plan on when to eat?	5=I always have a plan on when to eat, 4=I am always trying, 3=I am trying some times, 2=I am trying rarely, 1=I do not bother to have a plan on when to eat
H11B	Do you eat breakfast?	5=Every day, 4=Most of the days, 3=Once or twice a week, 2= Sometimes, 1=Never
H12A	Do you usually take a shower after exercise or playing games?	5=Always, 4=Often, 3=Some time, 2=Rarely, 1=Never
H12B	Exercise or playing games can help people to get a better health?	5=I Strongly agree, 4=I agree, 3=It depends, 2=I disagree, 1=I strongly disagree
H13A	In the past week, how many times did you do any exercise that did make you sweat or made you feel tired? (soccer, running, swimming, bicycling)	5=five or more times, 4=three or four time, 3=Twice, 2=Once, 1=I do not exercise
H13B	In the past week, how many times did you do an exercise or an activity that did NOT make you sweat or made you feel tired? (walking)	5=five or more times, 4=three or four time, 3=Twice, 2=Once, 1=I do not exercise
H14A	How much time each day do you play computer games or watch television?	1=more than 4 hours, 2=one to three hours, 3=30 minutes to one hour, 4=less than 30 minutes, 5=I do not use a computer or watch television,
H14B	Do you enjoy movement, exercise and sports?	5=Definitely Yes, 4=A lot, 3=Sort of, 2=Not really, 1=Not at all,
S21A	How comfortable do you feel when talking about problems with your PE -/life orientation teacher?	5=Very comfortable, 4=comfortable, 3=slightly uncomfortable, 2=uncomfortable, 1=very uncomfortable,
S21B	Do you have a feeling that the PE teacher cares for you and supports you in class?	5=always, 4=usually, 3=sometimes, 2=hardly ever, 1=never
S22A	Do you have problem mixing with other learners during PE/LO lessons?	1=Big problems, 2=Not too big problems, 3=some problems, 4=a little problems, 5=no problem at all
S22B	Do you have a feeling that your PE/LO teacher treats other learners equally?	5=always, 4=usually, 3=sometimes, 2=hardly ever, 1=never
S23A	**Swedish Version**: During school time, how often do you exercise or play together with other learners with other ethnic background? **South African version**: Do you feel that you are better in playing games or exercise than other learners who do not speak the same language as you?	5=always, 4=usually, 3=sometimes, 2=hardly ever, 1=never
S24A	**Swedish Version**: During school time, how often do you exercise or play together with learners with other ethnic background? **South African version**: During school time, how often do you exercise or play together with learners who have another religion?	5=always, 4=usually, 3=sometimes, 2=hardly ever, 1=never
S25A	Playing games or exercise helps ne to respect other people	5=Definitely Yes, 4=A lot, 3=Sort of, 2=Not really, 1=Not at all
S25B	Playing games or exercise teaches me to be part of a group	5=Definitely Yes, 4=A lot, 3=Sort of, 2=Not really, 1=Not at all
P31A	Does your PE/LO teacher praise you, when you do well?	5=always, 4=usually, 3=sometimes, 2=hardly ever, 1=never
P31B	Is PE/LO teacher warm and carrying toward you?	5=always, 4=usually, 3=sometimes, 2=hardly ever, 1=never
P32A	Does your PE/LO teacher encourage you to do things in new ways during exercise and playing games?	5=Indeed, 4=A lot, 3=sometimes, 2=hardly ever, 1=never,
P32B	How much do you feel that your PE/LO teacher is supportive of	5=always, 4=usually, 3=sometimes, 2=hardly

	you, when you do wrong?	ever, 1=never
P33A	How do you feel about going to school everyday?	5=I like it a lot, 4=I like it a bit, 3=It's OK, 2=I dislike it, 1=I dislike it a lot
P33B	How do you feel about exercise and playing games?	5=I like it a lot, 4=I like it a bit, 3=It's OK, 2=I dislike it , 1=I dislike it a lot
P34A	Do you like your teachers at school?	5=Always, 4=Usually, 3=Sometimes, 2=Hardly ever, 1=Not at all
P34B	Do you like your PE/LO teacher?	5=Always, 4=Usually, 3=Sometimes, 2=Hardly ever, 1=Not at all
P35A	Playing games and exercise helps me make new friends	5=Definitely Yes, 4=A lot, 3=Sort of, 2=Not really, 1=Not at all
P35B	Playing games or exercise helps me respect myself more	5=Definitely Yes, 4=A lot, 3=Sort of, 2=Not really, 1=Not at all
M41A	Which of the following games or sports do you like	5=all of them, 4=most of them, 3=some of them, 2=only one, 1=none of them
M41B	Do you have a feeling that you are a good player in your favorite game or sport?	5=Always, 4=Usually, 3=Sometimes, 2=Hardly ever, 1=Not at all
M42A	Do you enjoy playing soccer, netball, rugby, tennis, athletics, swimming, cricket, basketball, volleyball, table tennis	5=I like all of them, 4= I like most of them, 3= I like some of them, 2= I like only one, 1= I do not like any of them
M42B	I would like to play games and exercise more frequently in school	5=I Strongly agree, 4=I agree, 3=It depends, 2=I disagree, 1=I strongly disagree
M43A	How often do you participate in games and sports at school time?	5=every day, 4=almost every day, 3=twice a week, 2=once a week, 1=never, 8= no question, 9= no answer
M43B	When you watch games, how well do you understand the rules	5=very well, 4=rather well, 3=sometimes, 2=rather badly, 1=not at all

Appendix II: Variance-Covariance Matrices

Health Promotion

	H14B	H14A	H13B	H13A	H12B	H12A	H11B	H11A
H14B	.62							
H14A	.08	.95						
H13B	.01	-,14	1.55					
H13A	.25	.09	.17	1.29				
H12B	.55	.02	.13	.28	.64			
H12A	.19	.07	.08	.33	.22	1.03		
H11B	.14	.15	.05	.10	-.27	.23	1.27	
H11A	.19	-.02	.13	.13	.09	.07	-.07	1.65

Social Development

	S25B	S25A	S24A	S23A	S22B	S22A	S21B	S21A
S25B	.93							
S25A	.41	1.07						
S24A	.02	.07	1.69					
S23A	-.06	.05	.26	1.45				
S22B	.05	-.01	-.08	.09	1.42			
S22A	.21	.10	.10	-.07	.10	1.41		
S21B	.20	.18	.06	.06	.35	.22	1.06	
S21A	.09	.26	.13	.10	.19	.02	.36	1.05

Personal Development

	P35B	P35A	P34B	P33B	P34A	P32B	P33A	P32A	P31B	P31A
P35B	.85									
P35A	.47	1.54								
P34B	.25	.21	1.29							
P33B	.48	.47	.28	.61						
P34A	.26	.21	51	.29	.99					
P32B	.21	.13	.42	.16	.15	1.23				
P33A	.18	.23	.30	.24	.36	.05	.93			
P32A	.29	.24	.42	.18	.28	.43	.17	1.20		
P31B	.18	.11	.52	.15	.16	.45	.18	.42	.89	
P31A	.28	.23	.22	.20	.17	.32	.07	.32	.38	.94

Physical Development and Movement

	M43B	M42B	M43A	M42A	M41B	M41A
M43B	.78					
M42B	.34	1.28				
M43A	.43	.25	1.15			
M42A	.33	.44	.16	.91		
M41B	.36	.42	.35	.26	1.09	
M41A	.40	.44	.10	.78	.31	.83

The final 23-item questionnaire

Variance - Covariance Matrix

	S23A	M43B	M42B	M42A	M41A	P35B	P34B	P33A	P32B	P32A	P31B	P31A	S25B	S24A	S25A	S22B	S22A	H14B	H13B	H12B	H13A	H12A	H11B
S23A	1.89																						
M43B	-.051	.784																					
M42B	-.092	.336	1,28																				
M42A	-.134	.326	.440	.906																			
M41A	-.114	.398	.443	.779	.828																		
P35B	-.176	.286	.478	.240	.198	.846																	
P34B	.100	.108	.250	.147	.160	.245	1,23																
P33A	-.022	.384	.599	.322	.313	.478	.279	.609															
P32B	.004	.170	.139	-.017	.035	.210	.424	.160	1,23														
P32A	.036	.112	.306	.081	.101	.290	.416	.181	.432	1,12													
P31B	.059	.094	.127	.128	.107	.176	.520	.147	.452	.423	.892												
P31A	-.005	.165	.184	.044	.030	.283	.215	.200	.323	.324	.375	.943											
S25B	.115	.261	.354	.221	.248	.344	.231	.397	.139	.148	.182	.188	.928										
S24A	-.174	.024	.036	.004	-.008	.161	.024	.043	.008	.059	-.007	.08	.016	1,69									
S25A	-.007	.240	.197	.120	.177	.391	.249	.282	.243	.133	.099	.108	.409	.067	1,07								
S22B	.184	.040	.085	.010	.086	.051	.333	.137	.391	.239	.389	.245	.051	-.079	-.012	1,42							
S22A	.109	.017	.025	.098	.047	.086	.051	.107	.116	.092	.228	.048	.205	.098	.104	.095	1,42						
H14B	-.179	.183	.429	.292	.311	.493	.154	.460	.116	.099	.091	.086	.328	-.016	.172	.077	-.028	.616					
H13B	-.190	.056	.076	-.134	-.154	.187	.192	.222	.091	.112	.065	.033	.195	-.010	.322	-.019	.089	.007	1,55				
H12B	-.096	.169	.274	.240	.179	.411	.115	.455	.166	.049	.062	.042	.188	.061	.202	.027	.049	.514	.130	.641			
H13A	-.016	.186	.119	.065	.096	.085	.100	.257	.121	-.029	.081	.054	.220	-.041	.199	.101	-.043	.249	.172	.282	1,22		
H12A	-.017	.340	.030	.006	.021	.054	.069	.119	.082	-.076	.104	.063	.127	-.028	.070	.054	-.003	.187	.081	.218	.325	1,03	
H11B	-.037	.233	.124	.176	.123	.163	.051	.060	.141	.144	.028	.009	.147	.074	.131	.028	.035	.137	.050	-.069	.102	.233	1,27