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Historical and Philosophical Foundations

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Editorial

IJPE issue 4/2012 with the topic ‘Historical and Philosophical Foundations’ deals with historical and philosophical aspects of physical education and sports pedagogy.

This issue contains two extensive review articles, one by the North American research group led by Prof. Dr K. Volkwein, dealing with selected philosophy of sports texts in English and Slavonic, the other by Prof. Dr A. Müller from Germany dealing with historical-philosophical foundations of sports pedagogy.

In addition, the results of a Luxembourg study – conducted by Prof. Dr W. Becker (Luxembourg) – are presented in the research article ‘The general sport motor function ability of Luxembourgian pupils - An analogy between legends and facts’.

In addition to the sections Book Information / Book Review, IT News and Information, issue 4/2012 contains news of five further organisations: ICSSPE, ISCPES, EUPEA, ENSEE and FIEP. The Upcoming Events section provides an outlook on scientific conferences in 2013.

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The general sport motor function ability of Luxembourgian pupils - An analogy between legends and facts

W. Becker, & G. Malané (Luxembourg, Luxembourg)

Introduction

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2 Study I

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2.2 *Results*

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3.1 *Data collection*

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Abstract

The analysis at hand deals with the question as to whether the physical ability of Luxembourgian pupils has altered. To show this, the current data on physical fitness is compared to older reference values. We chose to focus on pupils from the first and second grades aged six to eight because those have not been analyzed in recent studies (Bös et al., 2005) and also because possible causes for an emerging trend are more likely to have affected younger children, as a change in consciousness – coupled with corresponding actions – possibly had a lower chance of becoming effective. Here, two examinations will be discussed, the first of which has been edited and shortened. Two coincidental observations seem to be significant enough to be verified through a repeated random sample.

In an additional synopsis, one could draw conclusions on the sport motor function ability of Luxembourgian pupils. Out of this one could initiate curricular and extracurricular physical activities for the students, with focus on the relation and behaviour in these area (Becker, 2008).

Results showed that the average performances of the pupils of 1st and 2nd grades in comparison to the old standard values have remained constant, but the form of distribution has changed: There is a higher frequency of well above-average and well below-average performances. The results of Study II demonstrated that children sent to school at the appropriate age show better performances than older children and that boys perform better than girls. Differences between nationalities could not be found.

Key words: holistic pedagogy of prevention, interdisciplinary-integrative-transversal teaching and learning, culture of movement, nutrition and recreation as constituent element, health competence, body knowledge, health education, model of salutogenesis, health protection as a strategy in life, children's undamaged world of movement

1 Theoretical background

Many studies address the subject of the change of the physical evolution. Where children and adolescents are concerned, the focus of interest most of the time is on fitness; its different aspects, such as endurance, strength, speed, coordination and flexibility, can be operationalized with the right test procedure. The results of many studies show a decrease in fitness. Representative for the wide spectrum stands the design of Bös (2003), which is characterized by its different populations and data collection dates. The meta analysis of Tomkinson et al. (2003) showed that aerobic fitness had decreased by 0.43% every year between 1981 and 2000. This included 55 studies with roughly 130,000 test subjects between the ages of six and nine from eleven countries. One could draw the conclusion that there is a universal and regular tendency towards a decrease in fitness.

A change in childhood and adolescence is often brought up as being a cause for this decrease. To show this it will require a comprehensive system of biological, social, economic, etc. factors, which Hirtz (2007) calls "*Kontextualismus und psycho-soziale Einheit*" (contextualism and psycho-social unit). The coherence between the different observed changes has often a logical relation with each other. However, on an empiric level it can be very difficult to discern the difference between contingency and causation. The importance for this study is the possibility that social factors, which have a direct or intermediary effect on the fitness, might change. Hirtz (2007) has analysed the course of the somatic and motor-coordination changes of the last decades. Body size and weight increased during this time, cognitive factors also improved and an 'athletic acceleration' was observed, whereby condition and coordination respectively developed differently, depending on age, gender, physical prowess, etc. However, in the mid-80s this acceleration ended and was replaced by a widespread and distinct decline in performance; for coordinative tasks this reversal began at a later date.

New questions arise within this context, often reflecting hidden presuppositions. Kretschmer (2004) expressed this during the analysis of the FAQs on the topic of 'Fitness for children'.

To put it bluntly: everything was better in the good old days and the future is bleak. However, Kretschmer's (2004) current studies on students in Hamburg show that a deterioration of physical ability is hardly the case. Interpreted cautiously and specific to the region of Hamburg, the data suggests a tendency toward improvement of fitness.

There are further considerations that warrant interest in new data, specifically on younger children. Wydra et al. (2005) studied Luxembourgian students aged twelve to 16 and found confirmed the thesis of deterioration. However, a study conducted in the neighbouring Saarland region of Germany (Klein et al., 2004) produced very heterogeneous results: six tests were concluded with a total of three cases of deterioration, two cases of improvement and one "draw".

Thus the question of the course or the consistency of the described trends is yet to be answered clearly. It seems particularly possible that the attention the media has lavished on to the topics of fitness and health has caused a change in trends itself, seeing as the health care system, politicians and pedagogic institutions have increasingly made efforts to counter this negative development; parents and children themselves might have become active after becoming aware of the problem. Though this is not the topic of the following study. Formulating explicit hypotheses will be expressly avoided at first, nevertheless we would like to raise the question as to whether or not the fitness levels of Luxembourgian schoolchildren has altered with reference to the standards of Bös and Wohlmann (1986).

2 Study I

The analysis was carried out in 2004 by 58 qualified investigators. They used the common sport motor function test for kids (AST6-11) of Bös and Wohlmann (1987). The test included the following tasks: speed of action (20m), aim, speed of a ball (ball), address (obstacle), speed, endurance (6 min).

2.1 Sample

The study was carried out with N=1195 students of the first and second grade. The percentage of boys was 54% and the girls 46%. The nationalities were broken down into 60.9% from Luxembourg, 4.1% were French, 21.8% Portuguese, 2% German, 2.2% Italian and 9% other nationalities. The evaluation included data from 1078 students between the ages of six and nine. The data of the nine-year-olds and older were not considered in the significance tests, since the portion of these in the samples ranked by age, gender and discipline, were just too small.

2.2 Results

The first step to show constancy or a change of the physical ability was to calculate the average and the standard deviation of the results of the 48 subgroups. These subgroups consisted of a combination of the six sub-tests of the AST, gender and three age brackets. These means were attributed to the average score etc. with the help of the standards set forth by Beck and Bös. It is now possible to compare the abilities with the ones from the year 1984/85. This leads to six above-average, 34 average and eight below-average results. This first computation points more towards constancy over the years.

Table I

Results of the female pupils aged six. ST: spot test seize. M: mean. SD: standard deviation. p: the significance of the deviation from the mean value. +/-: Improvement/deterioration from the average value. Eva: evaluation (aa: above-average, a: average, ba: below-average)

	Lux. data				Norm data				p	+/-
	ST	M	SD	Eva	ST	M	SD			
20m	113	5.1	0.6	a	125	4.8	0.5	1.00%	-	
Aim	114	5.7	3.9	a	125	6.1	1.6			
Ball	110	7.5	6.6	aa	124	6.3	3.5	5.00%	+	
Obstacle	108	25.8	4.7	a	123	25.8	5			
Speed	80	2.6	0.7	a	124	2.3	0.5	5.00%	+	
6 min.	89	764.8	147.3	a	124	832.3	134.2	1.00%	-	

Table II

Results of the female pupils aged seven

	Lux. data				Norm data				
	ST	M	SD	Eva	ST	M	SD	p	+/-
20m	243	4.9	0.6	a	240	4.7	0.5	1.00%	-
Aim	253	7.3	3.9	a	240	7.3	1.9		
Ball	252	11.2	7.2	aa	240	9	3.8	1.00%	+
Obstacle	248	25.2	5.6	a	239	24.5	3.8	1.00%	-
Speed	218	3	0.7	a	240	2.7	0.6	1.00%	+
6 min.	209	804.4	171.8	a	209	854.5	121.2		

Table III

Results of the female pupils aged eight

	Lux. Data				Norm data				
	ST	M	SD	Eva	ST	M	SD	p	+/-
20m	77	4.7	0.5	a	143	4.5	0.4	1.00%	-
Aim	92	8.2	4.2	a	143	8.9	2	1.00%	-
Ball	94	12.9	7.8	a	143	15.2	4.2	1.00%	-
Obstacle	96	24.8	4.3	a	143	22.9	3.8	1.00%	-
Speed	74	3.1	0.6	a	143	2.9	0.6	1.00%	+
6 min.	78	817.5	146.2	ba	143	909.42.9	127.7		

Table IV

Results of the male pupils aged six

	Lux. Data				Norm data				
	ST	M	SD	Eva	ST	M	SD	p	+/-
20m	147	4.9	0.6	a	180	4.7	0.4		
Aim	147	9.1	4.4	a	150	8.3	1.9	5.00%	+
Ball	138	11.9	7.6	aa	149	10.2	4.1	1.00%	+
Obstacle	143	23.5	4.4	a	149	24.8	5.3	1.00%	+
Speed	107	3	0.7	a	149	2.7	0.6	1.00%	+
6 min.	129	804.2	145.6	a	147	864.2	122.8	1.00%	-

Table V*Results of the male pupils aged seven*

	Lux. Data				Standard data				p	+/-
	ST	M	SD	Eva	ST	M	SD			
20m	217	4.7	0.6	a	242	4.5	0.4	1.00%	+	
Aim	281	9.9	4.3	a	242	10.2	1.9			
Ball	277	15.3	7.9	aa	241	14.1	4.4	5.00%	+	
Obstacle	266	22.5	4.4	a	243	23.1	4.9			
Speed	241	3.5	0.8	aa	243	3	0.6	5.00%	+	
6 min.	236	891.8	187.8	a	243	892.1	126.5			

Table VI

Results of the male pupils aged eight

	Lux. Data				Standard data				p	+/-
	ST	M	SD	Eva	ST	M	SD			
20m	109	4.5	0.5	a	173	4.4	0.5	1.00%	-	
Aim	119	11	4.8	a	173	12.6	2.1	1.00%	-	
Ball	118	17.3	8.6	a	173	20.4	4.5	1.00%	-	
Obstacle	115	21.9	4.4	a	173	21.4	4.8			
Speed	99	3.8	0.9	a	174	3.6	0.7	1.00%	+	
6 min.	90	920	175.2	a	172	970.4	134.5			

The data was tested for significance by t-test (for independent samples with heterogeneous variance, α level: .05). Thirteen improvements were found in comparison to twelve deteriorations. If we interpret the eleven insignificant deviations as “no variation”, there is no indication of a general variation of the physical capability over time.

However, these results – as an average – could have been caused by changes in data distribution. The “good” pupils could have improved and the “bad” ones deteriorated even more. This suspicion can be clarified with the help of the standard value (percentage degree, or z-value of Beck and Bös 1995), with which the expected frequency in the classes on a scale of five can be calculated. In this way, the frequency of the current samples can be compared to the standard value from the year 1986. The average frequencies of the six AST results were calculated. The χ^2 test, which was used to test the significance, was calculated at $p < .01$ and was therefore highly significant. Results significantly above or below average were over-represented and the three middle sections under-represented.

A possible reason for above differences could be ‘nationality’. A multi-varied variance analysis with the six AST results as dependent variables showed minimal differences at insignificant levels.

The assessment of the data raised the suspicion that children sent to school at the appropriate age achieved better results than older ones. Therefore, the six-year-old children of the 1st grade were compared to the seven-year-olds or older children and the same procedure was applied to the 2nd grade. A multi-varied variance analysis with the non-variable factors 'age appropriate' and 'gender' was calculated. With respect to both factors the results were highly significant ($p < .01$). With a result of 3.08 as compared to 3.2, children sent to school at the appropriate age outdid their elders and boys achieved better results than girls (3.02 vs. 3.12⁴).

3 Study II

Study II has the following objectives:

- a) The competence level of the students should be compared again to the older standard values. Without going to the extent of developing proper statistical hypotheses, no differences are expected for any new samples.
- b) Two hypotheses should be verified:
 - The distribution of the achievement parameters do not correspond to the expectations that stem from the standards set by Beck and Bös (1995); the frequency of middle values is smaller, and that of deviating values higher.
 - Children not sent to school at the appropriate age show a lower performance.
- c) Within the remaining data (affiliation to 1st or 2nd grade, age, gender, nationality and mother tongue), correlates should be explored for sport motor performance that could lead to an explanation of the differences in performance.

3.1 Data collection

The field work was conducted in 2005 by suitably qualified investigators. Three methods of testing were used: six-minute-run (Beck & Bös, 1987), target throwing (Beck & Bös, 1987), push-ups (Bös et al., 2001). Furthermore, the following data was collected: affiliation to 1st or 2nd grade, age, gender, nationality and mother tongue.

3.2 Sample

The field work was conducted with $N=1141$ ⁵ pupils of 1st and 2nd grades of primary schools in Luxembourg. Sample selection was random and can be characterized as follows: 427 pupils (37.4%) attended 1st grade and 550 pupils (48.2%) 2nd grade. 48.3% were male and 51.7% female pupils. The nationality distribution was as follows: 56.7% from Luxembourg, 3.9% were French, 23.4% Portuguese, 1.1% German, 3.2% Italian and 11% other nationalities. Attribution to the factor mother tongue presents a virtually identical distribution.

⁴ Average of the six AST values on the scale of five

⁵ Due to missing values, the sums of percentages often do not add up to 100%. Furthermore, there are substantial differences between the sub-samples

3.3 Results⁶

In order to be able to evaluate a change in fitness levels, the results were compared to the standard values as defined by Bös and Wohlmann (Beck & Bös, 1995). Tables 7 to 10 show these results.

Table VII

Mean values, standard deviation and sample size (in brackets) of test results of pupils aged six. Comparison of actual and standard values

	Male		Female	
	Lux.	Standard value	Lux.	Standard value
6 min.	900.5 (142.2; 71)	864.2 (122.8)	836.2 (170.9; 70)	832.3 (134.2)
Target	7.6 (4; 73)	883 (1.9)	5 (3.4; 74)	6.1 (1.6)
Push-up	11.4 (4.7; 67)	11 (4)	11.6 (3.9; 65)	11 (4)

Table VIII

Pupils aged seven. For legend, cf. Table I

	Male		Female	
	Lux.	Standard value	Lux.	Standard value
6 min.	911.8 (179.3; 164)	892.1 (126.5)	833.1 (163.5; 176)	854.5 (121.2)
Target	9.9 (4.4; 179)	10.2 (1.9)	6.9 (4.1; 201)	7.3 (1.9)
Push-up	13.7 (4.2; 176)	11 (4)	12.5 (4.1; 190)	13 (4)

Table IX

Pupils aged eight. For legend, cf. Table I

	Male		Female	
	Lux.	Standard value	Lux.	Standard value
6 min.	959.5 (163.1; 148)	970.4 (134.5)	979.6 (156.8; 155)	909.4 (127.7)
Target	11.1 (4.4; 164)	12.6 (2.1)	8.3 (3.6; 180)	8.9 (2)
Push-up	13.54 (4.2; 155)	13 (4)	13.8 (4.2; 164)	13 (4)

A chi² test was used to test if there were differences between the actual Luxembourg data and the older standard values. The test was done bilaterally with heterogeneous variance. The α level .01 was chosen.

⁶ The computer program SPSS was used for these calculations

Of the 24 tests, three reached levels of significance; two were improvements and one represented a deterioration:

- 7-year-old boys and girls achieve a higher number of push-ups
- 8-year-old boys obtain lower levels in target throwing.

Table X

Pupils aged nine. For legend, cf. table 1

	Male		Female	
	Lux.	Standard value	Lux.	Standard value
6 min.	958.5 (166.4; 21)	965.4 (126.2)	845.6 (156.3; 16)	893.6 (115)
Target	12.6 (4.9; 21)	15.2 (1.9)	10.4 (3.5; 19)	10.7 (2.1)
Push-up	13.4 (5.5; 18)	14 (4)	13 (3.9; 19)	15 (5)

However, these variations should not be overrated. On the one hand, the high number of t-tests is problematic, as the probability of 'random' significance increases. On the other hand, similar unsystematic fluctuations between different samples can also be found when the results of Beck and Bös (1995) are analyzed. Consequently, the general picture may not be interpreted as a general change in the average level of fitness.

In order to check hypothesis (a), the frequencies found in the current study with respect to the five categories of evaluation were compared to the frequencies that can theoretically be expected from the older standard values (cf. Beck & Bös, 1995). Table 11 shows the frequency values of the total sample for the three test methods.

Table XI

Frequency of the five categories of evaluation. In brackets: percentage. E-values refers to the theoretically expected values

	Well above-average	Above-average	Average	Below-average	Well below-average
6 min.	162 (15.6)	222 (21.4)	344 (33.2)	208 (20.1)	100 (9.7)
Target	139 (12.8)	198 (18.2)	294 (27.1)	294 (27.1)	161 (14.8)
Push-up	291 (28.1)	202 (19.5)	164 (15.8)	187 (18.1)	191 (18.5)
E-value (%)	8	24	36	24	8

Both extreme categories of evaluation 'well below-average' and 'well above-average', respectively, are more strongly and the middle sections more weakly represented as would have been expected from a theoretical point of view. The chi-square test for all three categories was highly significant ($p < .01$).

To test hypothesis (b), the average performance (middle value of the categories of evaluation 1-5 with respect to the three disciplines) of the six-year-olds of the 1st grade was compared to that of the seven-year-olds or older children. Table 6 shows the results.

Table XII

Specific values for children sent to school at the appropriate age and older children, respectively

	Age-appropriate	Older
Grade 1	M=2.8 S=0.83 N=134	M=3.1 S=0.93 N=205
Grade 2	M=2.6 S=0.86 N=152	M=3 S=0.92 N=303

The results were tested for significance with multivariate analysis of variance, which as independent factors also considers 'grade 1 vs 2' and 'gender'. The factor 'nationality' presents a problem due to the low frequencies in case of some nationalities, which makes further analysis difficult⁷. The dependent variables were the five categories of evaluation of the three disciplines. The factor 'grade 1 vs 2' did not achieve any level of significance ($p > .05$). The results for factors 'gender' ($p < .05$) and 'sent to school at appropriate age' ($p < .05$) are statistically significant. As regards boys and girls respectively, the following values were calculated: M=2.8 (SD=.93, N=441) and M=3.0 (SD=.88, N=453). None of the interactions reach significance level (all $p > .05$).

Finally, we wish to investigate the assumption from Study I above that younger students show a better performance. This observation might more correctly need to be ascribed to a confusion of factors 'age' and 'sent to school at appropriate age'. This assumption can be checked with the help of a partial correlation analysis and Table 7 shows the corresponding correlation matrix.

Table XIII

Inter correlation matrix

	Achievement	Appropriate Age
Age	0.12	0.7
Achievement		0.17

All correlations are highly significant. The correlation between 'age' and 'sent to school at appropriate age' creates the confusion and for this reason is used for control purposes. The thus calculated partial correlation is $r_{12.3} = .004$ ($p > .05$): therefore, there is no correlation between age and performance.

Discussion

Study I and II showed the following matching results:

First, the average performances of the first and second graders have remained constant when compared to the old standard values. In contrast to the studies of Kretschmer (2004) and Wydra et al. (2005), which refer to a deterioration of physical ability, first and second graders showed equal average performances in physical ability in comparison to the old standard values. On the other hand, distribution has changed:

⁷ Further calculations also show that this factor is of low importance. The same applies to 'mother tongue'.

there is a higher frequency of well above-average and well below-average performances.

The results of Study II confirmed the suspicion that arose after examination of the data of Study I. They demonstrated that children sent to school at the appropriate age show better performances than older children and also that boys perform better than girls. Meanwhile differences between nationalities could not be found.

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