MANIFESTATION, ASSESMENT AND DEVELOPMENT OF COORDINATION AT MACEDONIAN CHILDEN IN EARLY SCHOOL PERIOD

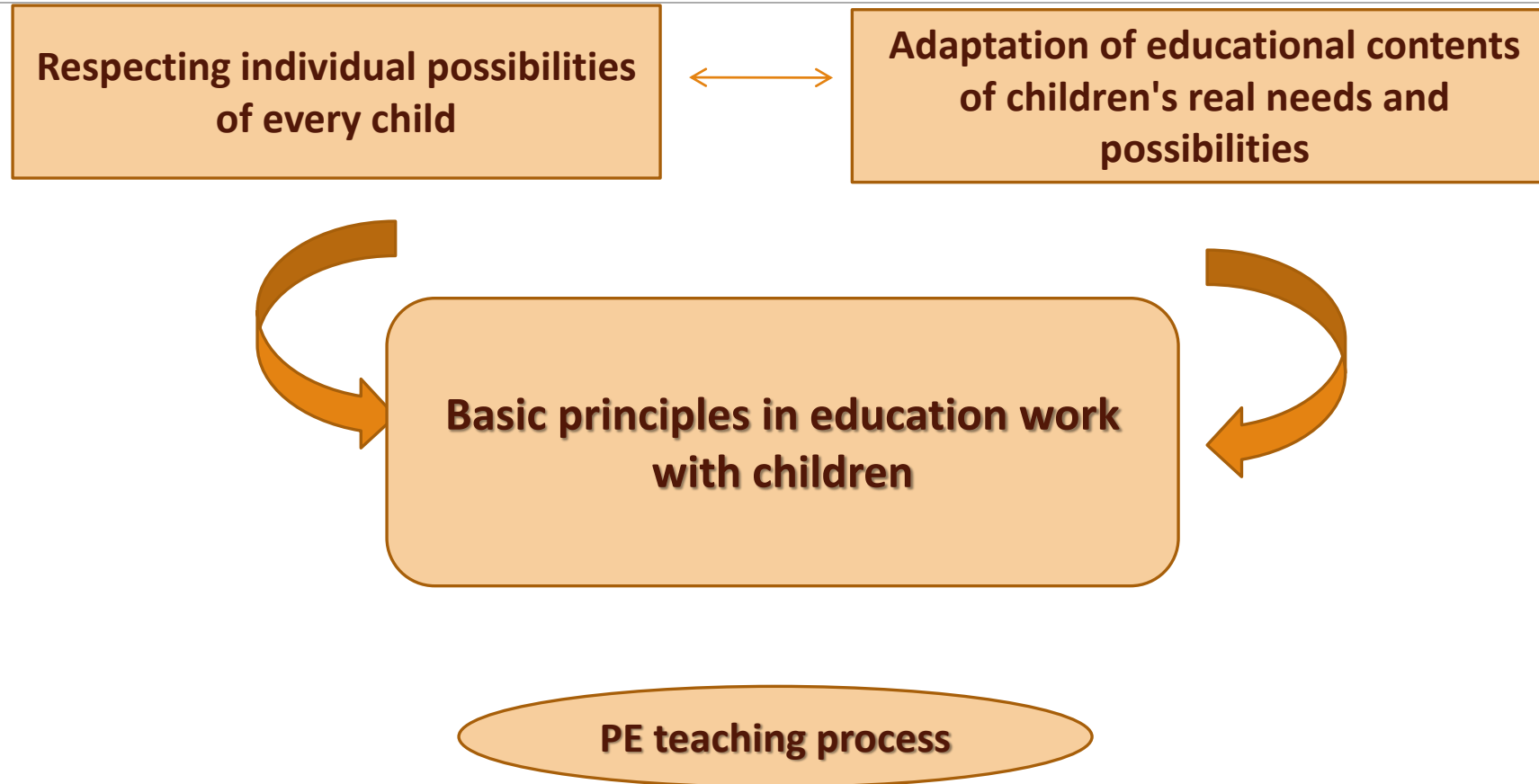## PHD BILJANA POPESKA

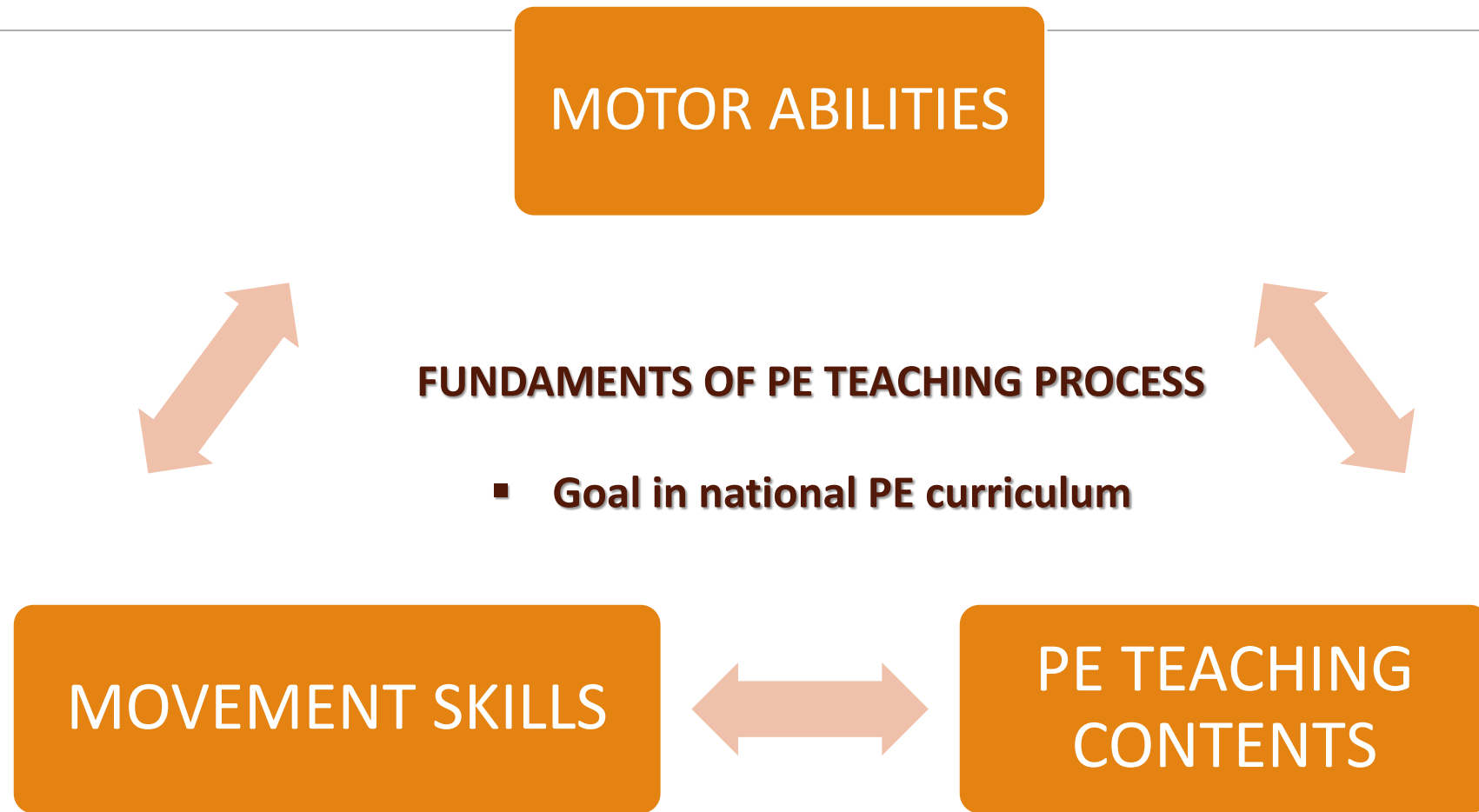### GOCE DELCEV UNIVERSITY– STIP, MACEDONIA
FACULTY OF EDUCATIONAL SCIENCES

PE Teaching process

Respecting individual possibilities of every child

$\longleftrightarrow$

Adaptation of educational contents of children's real needs and possibilities

Basic principles in education work with children

PE teaching process

PE TEACHING PROCESS

MOTOR ABILITIES

FUNDAMENTS OF PE TEACHING PROCESS

- **Goal in national PE curriculum**

MOVEMENT SKILLS

PE TEACHING CONTENTS

MOTOR ABILITIES IN CHILDREN

Different manifestation compared with adults

(Jürimäe & Jürimäe, 2001; Malina, 2004; Pišot & Planinšec, 2005, Bala & Katić, 2009)

Different manifestation in each period during childhood

Highly related with development characteristics in each period of age

COORDINATION

Manifestation

- ability to perform complex movement and movement tasks

- ability for fast and rational reorganization of movements and adaptation on new conditions

- ability for fast acquisition of new movement tasks

Conditioned by

- *Development of nervous system,* h=0.80, positive correlation with IQ

- Brain activity, activity of sensor system, activity of motor zone of the cortex

- Ability for fast muscle relaxation

Latent structure

- Complex structure

- Integrates several components: balance, spatial orientation,

speed of reaction, sense of ritham and synchronization on movements in time

Aim of the work

- To determine the test characteristics of movement tasks applied for estimation of coordination in 6 and 7 years old male children.

- To determine the changes in manifestation of coordination at the same group of children at the age of 6 and lately at the age of 7 years as well as to predict the factors that indicated those changes.

METHOD AND MATERIALS - Sample of respondents

Total number of 246 examiners

❑Pupils in 5 primary schools in Skopje, Republic of Macedonia

Longitudinal research

❑*Initial measurement -* 123 six years old male children, *first grade pupils*

❑**Final measurement** - 123 seven years old male children, second grade pupils

METHOD AND MATERIALS - Sample of variables

Co – ordination with stick (KOPAL)

Obstacle course backwards (KOPON)

Two balls slalom rolling (KOSL2)

Rolling with the ball on floor (KOTRT)

METHOD AND MATERIALS

1. TEST CHARACTERISTICS

Discriminativity and homogeneity - measures for tendency and dispersion

Reliability   - Crombah α and Spearman – Brown`s (SB) coefficients of reliability

Validity   - Pearson`s – coefficient of correlation (r)

                               - Factor analyses (Hotelling procedures)

Representativity   - Kaiser-Meyer-Olkin`s measure

2. DIFFERENCES BETWEEN TWO GROUPES

t – test $p < 0.01$ and $p < 0.05$ degree of significance

RESULTS - test characteristics

Basic statistic parameters determined at 6 years old children

	Mean	SD	Sx	KV	skew	kurt	KS	p
KOPAL 1	8,22	3,08	0,28	37,48	1,00	0,89	0,11	p < ,15
KOPAL 2	7,13	2,58	0,23	36,24	0,88	0,69	0,11	p < ,10
KOPAL 3	6,88	2,72	0,25	39,49	1,19	1,44	0,15	**p < ,01**
KOPON 1	28,90	7,55	0,68	26,11	0,73	0,48	0,07	p > ,20
KOPON 2	26,73	7,29	0,66	27,28	0,66	0,42	0,10	p < ,20
KOPON 3	25,89	7,37	0,66	28,45	0,83	1,30	0,09	p > ,20
KOSL2 1	42,78	12,15	1,10	28,41	0,86	0,68	0,11	p < ,15
KOSL2 2	39,80	9,59	0,86	24,08	0,83	1,49	0,08	p > ,20
KOSL2 3	38,42	9,20	0,83	23,95	0,71	0,62	0,07	p > ,20
KOTPT 1	8,01	1,44	0,13	17,99	0,57	1,16	0,05	p > ,20
KOTPT 2	7,43	1,33	0,12	17,83	0,96	1,55	0,10	p < ,15
KOTPT 3	7,29	1,16	0,10	15,92	0,85	1,30	0,08	p > ,20

Basic statistic parameters determined at 7 years old children

	Mean	SD	Sx	KV	skew	kurt	KS	p
KOPAL1	6,64	2,07	0,19	31,15	0,85	0,39	0,09	p > ,20
KOPAL2	6,24	1,85	0,17	29,72	0,50	-0,36	0,09	p > ,20
KOPAL3	6,39	1,87	0,17	29,29	0,77	0,49	0,10	p < ,20
KOPON1	21,88	6,96	0,63	31,83	1,14	1,79	0,11	p < ,10
KOPON2	21,08	6,31	0,57	29,95	0,98	1,28	0,11	p < ,15
KOPON3	20,97	6,42	0,58	30,63	0,64	-0,25	0,09	p > ,20
KOSL21	32,65	8,57	0,77	26,24	1,48	4,09	0,10	p < ,20
KOSL22	32,17	8,76	0,79	27,23	2,02	7,76	0,12	p < ,05
KOSL23	32,28	8,28	0,75	25,66	1,87	5,92	0,13	p < ,05
KOTRT1	5,99	1,29	0,12	21,52	1,48	6,11	0,07	p > ,20
KOTRT2	5,89	1,30	0,12	22,09	1,94	7,31	0,13	p < ,05
KOTRT3	5,96	1,30	0,12	21,82	2,16	9,10	0,12	p < ,10

- Normal distribution of results at all 4 tests applied at the age of 6 and 7 years

- Good sensitivity of all four tests applied at both age groups

- Based on the values of KV% and kurt children achieved homogeneous results in both tested periods

RESULTS - test characteristics

Characteristics of tests used for estimation of co – ordination applied at 6 years old children

Test	Discr.	Reliability		Validity					Repres.
	mean:SD	Cronbach`s α	SB	H 1				%	KMO
				1	2	3			
KOPAL	-	.92	.93	.91	.94	.95		87,33%	.75
KOPON	+	.95	.95	.94	.96	.96		90,85 %	.77
KOSL2	+	.94	.95	.93	.96	.96		90,12%	.76
KOTRT	+	.81	.81	.84	.87	.85		72,73%	.71

Characteristics of tests used for estimation of co – ordination applied at 7 years old children

test	Discr.	Reliability		Validity					Repres.
	mean:SD	Cronbach`s α	SB	H 1				%	KMO
				1	2	3			
KOPAL	+	.91	.91	.90	.94	.93		85.18%	.74
KOPON	+	.95	.95	.93	.97	.96		91,16 %	.75
KOSL2	+	.98	.98	.98	.98	.98		95.86%	.78
KOTRT	+	.92	.92	.90	.95	.94		85.98%	.74

❑ **High reliability and validity of all test applied in both age periods**

❑ **Good test characteristics of all four applied test at both age periods**

❑ **Best characteristics**

▪ 6 years - Obstacle course backwards

▪ 7 years - Two balls slalom rolling

Results are confirmed in other similar studies (Peric, 1991; Rajtmajer, 1997; Bala 1999; Popeska, 2009.
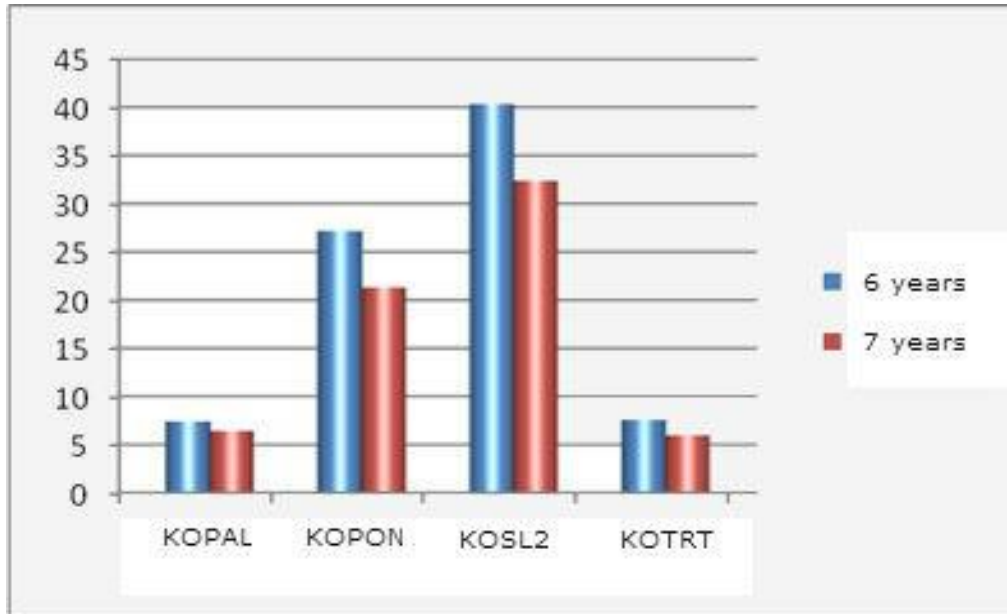
RESULTS

Differences between both age groups (t – test results)

Test	Age	X	SD	Sx	T - test	P
KOPAL	6years	7,41	2,61	,24	3,47	,001
	7years	6,42	1,78	,16		
KOPON	6 years	27,17	7,05	,64	6,89	,000
	7 years	21,31	6,27	,56		
KOSL2	6 years	40,33	9,78	,88	6,86	,000
	7 years	32,37	8,36	,75		
KOTRT	6 years	7,58	1,12	,10	11,02	,000
	7 years	5,95	1,20	,11		

❑ **Progressive improvement of tests results from first to last repetition at all test in initial measurement**

❑ **T – test results - statistically significant better results on a level 0.01 in final measurement at all applied tests**

DISCUSSION

Improvement in test achievement at the age of 7 is a result of:

- physiological bases
- Individual improvement of motor abilities as result of growth and developmental processes
- Emotional and psychological maturation
- greeter motivation and wish for better performance and success - characteristics specific for seven years old children.

Worst results achieved at **first repetition** in all tests applied in both age periods are expected considering:

- the **nature of coordination and it`s connectivity with motor learning process** (Schmidt&Lee, 2005)
- characteristics of first performance

Practical implementation of research results

Test with good metric characteristic

- Evaluation of children motor development

- Following the level of personal improvement of motor development on each child

- Objective criteria for creation of final grate from PE

CAN we IMPROVE COORDINATION in children using PE curricula ?

Can we improve coordination in children?

1. Performance an old familiar movements in new, changed conditions

2. Realization of movement on difficult manner – backward, eyes closed, opposite arm/leg.

3. Implementation of new unfamiliar motor movements and tasks for example practicing Brain Break Videos.

Brain Break Video used for improvement of coordination

New unfamiliar movements

Fast changes of movements

Different music and ritham in every video

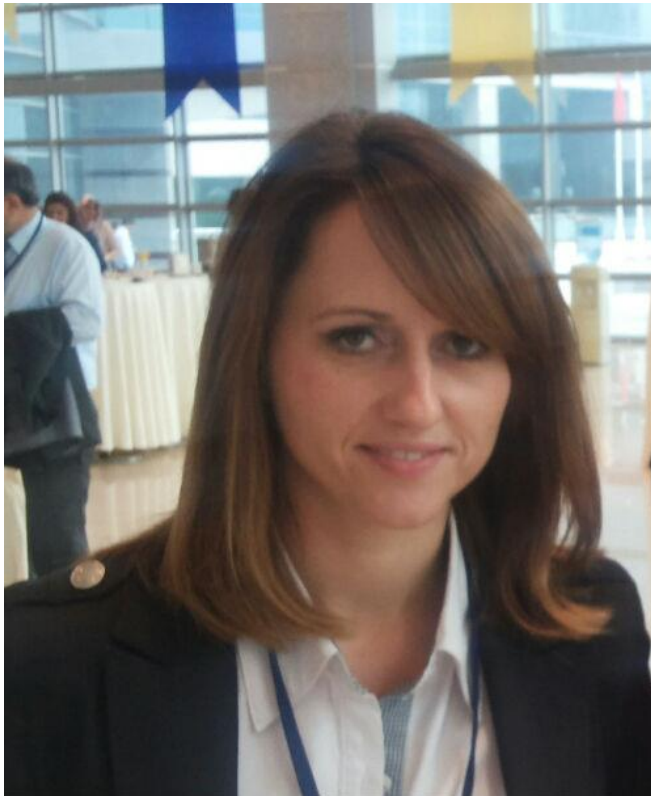**Different environment in each applied video**

My message

MOVE UP

DO BRAIN BREAK

LET`S MOVE THE WORLD WITH PHYSICAL ACTIVITY

Thank you for your attention

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