



# Influence of the sport practice on (psycho)motor development

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## Introduction : context of the research

- Master thesis of Noémie Piret => classic dancer
- Initial idea : to investigate the effects of classic dancing deliberate practice on children motor development
- In order to investigate the specific effects of the deliberate practice we decided to enlarge the research to other sports

2 Body control oriented sports



2 Object control oriented sports

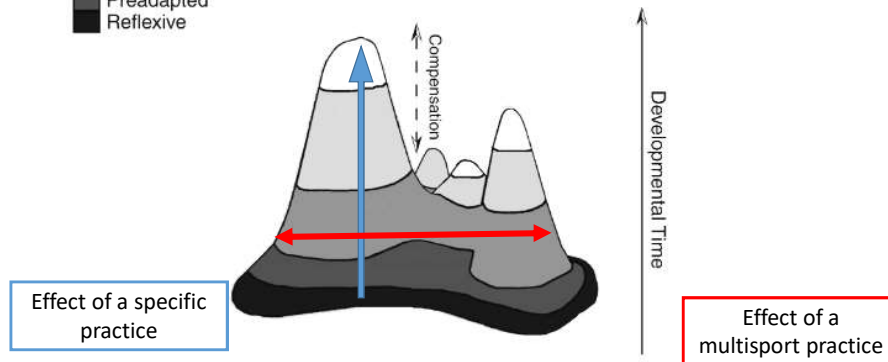


## Introduction : theoretical concept

- Mountain of motor development

(Clark et Metcalfe, 2002)

□ Skillful  
 □ Context-Specific  
 □ Fundamental Motor Patterns  
 □ Preadapted  
 □ Reflexive



## Aim of the study

- Q1 : Does a regular sport specific practice results in a specific (psycho)motor development ?
- Q2 : Does a multisport experience results in a superior (psycho)motor development ?

# Methods : population

53 prepubescent girls ( $\approx 10$  years old)

Groups	n	Age (months)	Weight (kg)	Height (cm)	BMI (kg.m <sup>-2</sup> )
Basketball	10	120 $\pm$ 5	34,2 $\pm$ 6,5	142 $\pm$ 5	16,9 $\pm$ 2,5
Danse	13	119 $\pm$ 7	31,5 $\pm$ 7,1	138 $\pm$ 6	16,3 $\pm$ 2,9
Judo	10	120 $\pm$ 7	40,8 $\pm$ 11,8*	141 $\pm$ 9	20,3 $\pm$ 4,3*
Tennis	10	120 $\pm$ 6	31,8 $\pm$ 6,5	137 $\pm$ 6	16,7 $\pm$ 2,1
Control	10	118 $\pm$ 5	32,7 $\pm$ 7,2	139 $\pm$ 7	16,9 $\pm$ 2,5
<b>Total</b>	<b>53</b>	<b>119<math>\pm</math>6</b>	<b>34,0<math>\pm</math>8,4</b>	<b>139<math>\pm</math>7</b>	<b>17,4<math>\pm</math>3,2</b>


$\geq 2$  years of deliberate and regular practise

$\geq 2$ H/week  
 $\geq 30$ weeks/year


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# Methods : (psycho)motor assesement


**Body control**



Flamenco Balance test  
*(Eurofit, 1993)*




Forward/back roll  
*(Francotte, 1999)*




Body schema  
*(Bertranne, 2007)*

**Flexibility**



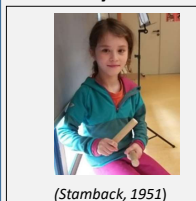
Lower limbs  
*(Eurofit, 1993)*



Shoulder  
*(Vanhelst et al, 2014)*


**Object control**

**Rhythm**



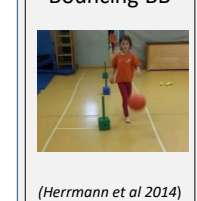
*(Stamback, 1951)*

**Spatial orientation**




*(Pradet et al, 1982)*

**Bouncing BB**



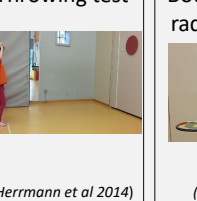
*(Herrmann et al 2014)*

**Catching a ball**



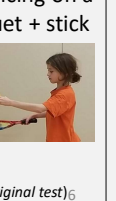
*(Francotte, 1999)*

**Throwing test**



*(Herrmann et al 2014)*

**Bouncing on a raquet + stick**



*(original test)<sub>6</sub>*

# Methods : parents questionnaire

## Written questionnaire => actual and previous practice:

- Children actual and previous deliberate sport practice
- Children free time activities
- Children musical experience
- Screen time
- Sport experience/level of the parents

**Questionnaire : historique sportif**

**Informations personnelles de l'enfant**

- Nom : .....
- Prénoms : .....
- Date de naissance : .....

**Questions concernant l'enfant**

**Activité sportive organisée hebdomadaire en club ou structure organisée (ASBL)**

1. Est-ce que votre enfant pratique une activité sportive principale actuellement (dans une association ou structure sportive) ?

Oui  
 Non

Si oui, quelle activité sportive ? .....

Depuis combien de temps ? .....

Combien d'heures par semaine en moyenne ? .....

2. Pratique-t-il d'autres sports actuellement ?

Oui  
 Non

Si oui, quel(s) sport(s) ? .....

Depuis combien de temps ? .....

Combien d'heures par semaine en moyenne ? .....

3. A-t-il pratiqué d'autres sports par le passé ?

Oui  
 Non

Si oui, quel(s) sport(s) ? .....

De quand à quand ? .....

Combien d'heures par semaine en moyenne ? .....

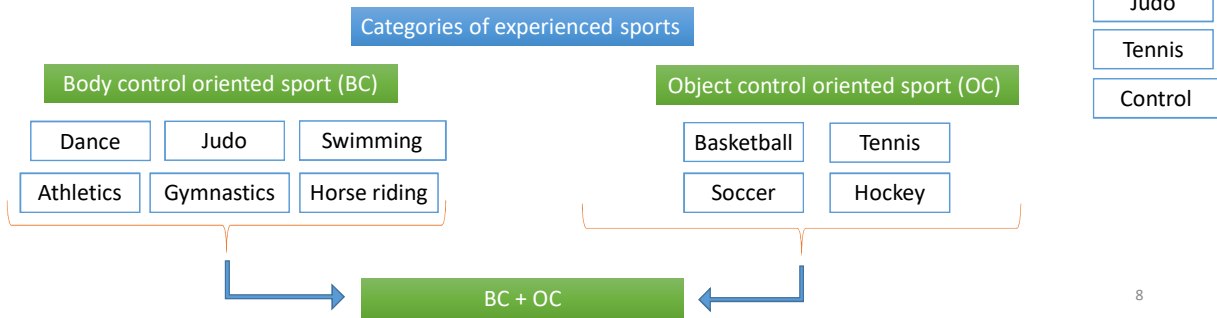
4. Il y a-t-il eu des périodes d'arrêt du sport prolongées d'au moins 3 mois hors vacances, que ce soit pour raisons médicales, familiales, scolaires, ... ?

Oui  
 Non

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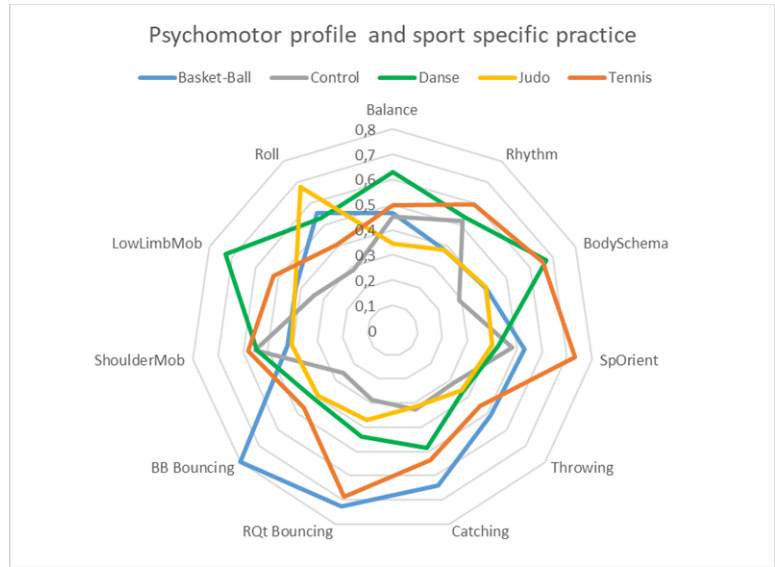
# Methods : analysis of the results

- Normalised scores (NSc) on a scale ranging from 0 to 1 (Min-Max scaling)
- Q1 => Influence of sport on each individual score /grouped score
- Q2 => correlation analysis
- Q2 => group comparison according to categories of experienced sports



# Results

**Q1** : Does a regular sport specific practice results in a specific (psycho)motor development ? **YES !**



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# Results

**Q1** : Does a regular sport specific practice results in a specific (psycho)motor development ? **YES !**

	Body Control	Object Control	Mobility	Rhythm	SpOrient	Global Score
Basket-Ball	0,48	0,67	0,42	0,38	0,53	0,50
Control	0,34	0,30	0,45	0,52	0,48	0,42
Dance	0,61	0,43	0,64	0,53	0,43	0,53
Judo	0,48	0,36	0,42	0,38	0,40	0,41
Tennis	0,52	0,54	0,55	0,60	0,73	0,59
<i>ANOVA</i>	<i>P&lt;0,05</i>	<i>P&lt;0,001</i>	<i>P=0,06</i>	<i>NS</i>	<i>P=0,06</i>	<i>P&lt;0,05</i>

Min **0,30** **0,35** **0,40** **0,45** **0,50** **0,55** **0,60** **0,65** **0,70** Max

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# Results

## Questionnaire results according to main sport

	H sport/w	# sports	H Screen /w	Parents sport Lev
Basket-Ball	3,9	1,3	5,4	2,7
Control	0,0*	0,0*	8,3	2,0*
Dance	3,7	1,5	9,5	2,7
Judo	3,5	1,4	7,3	2,3
Tennis	4,4	2,4#	5,9	3,0#
ANOVA	<i>P&lt;0,001</i>	<i>P&lt;0,001</i>	<i>NS</i>	<i>P&lt;0,01</i>

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# Results

## Relationships between measured variables

	Body Control	Object Control	Mobility	Rhythm	Sp Orient	Global Score
Body Control	1	0,28	<b>0,42*</b>	0,31	0,16	<b>0,65*</b>
Object Control		1	-0,03	0,24	<b>0,48*</b>	<b>0,62*</b>
Mobility			1	0,05	-0,08	0,39
Rhythm				1	<b>0,48*</b>	<b>0,72*</b>
Sp Orient					1	<b>0,71*</b>
Global Score						1

## Relationships between form variables and measured variables

	Body Control	Object Control	Mobility	Rhythm	Sp Orient	Global Score
H sport/w	0,33	<b>0,41*</b>	0,05	0,07	0,13	<b>0,29</b>
# sports	0,32	0,31	0,10	0,14	0,12	<b>0,30</b>
Screen H/w	-0,09	-0,15	0,07	-0,15	-0,17	-0,17
Parents sport Lev	0,09	0,22	-0,06	0,09	0,23	0,19

\* (p<0,01)

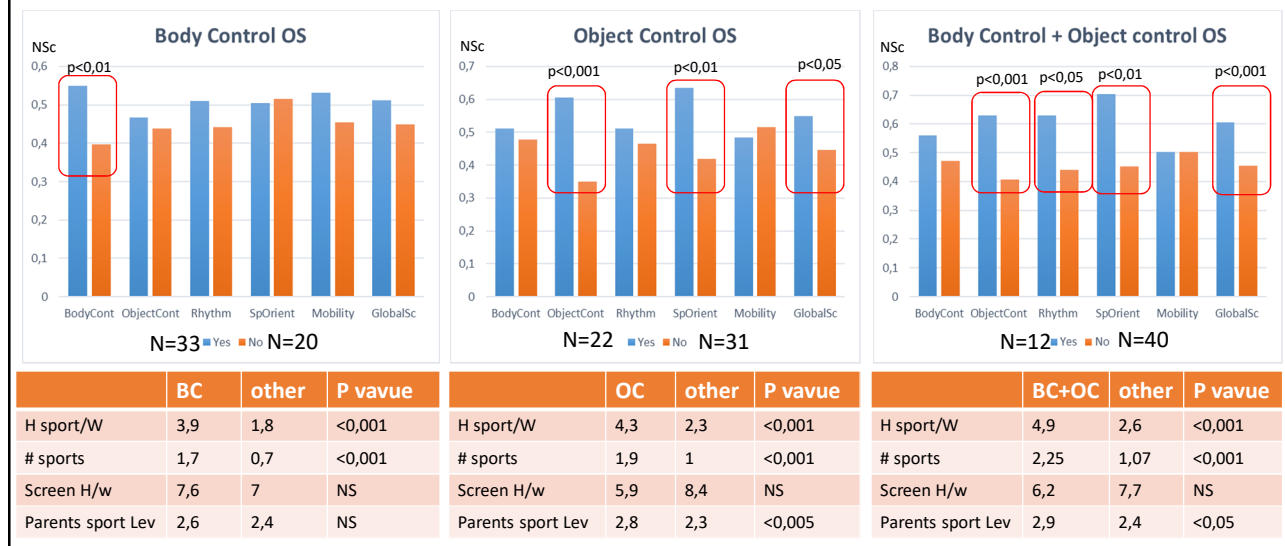
# Results

**Q2** : Does a multisport experience results in a superior (psycho)motor development ?



# Results

**Q2** : Does a multisport experience results in a superior (psycho)motor development ?



## Limits of the study

- Small size sample
- Original testing battery, not validated
- History of practice based on parents's declarations
- Results based on simple statistical analysis

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## Conclusion

- (Psycho)Motor development seems to be influenced by :
  - Sport deliberate practice
  - Volume of practice
  - Diversity and complementary of the practice
- Combining OC and BC oriented sports leads to superior global score
- Results in accordance with the « early diversification » theory (*Baker et al, 2003 ; Cote et al, 2014*).

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Thanks for your attention

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