Does promoting physical activity at school have a similar impact on all children?

Impact and moderating variables of the "*Great Challenge Live and Move*"

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Introduction: benefits of physical activity practice in childhood

- Benefits of regular physical activity (PA) practice on :
  - ✓ Physical health (e.g., decrease in obesity rate)
  - ✓ Psychological health (e.g., increase in well-being)
  - ✓ Social health (e.g., positive interactions) (Janssen & Leblanc, 2010)

- Adopting an active lifestyle during childhood is a key determinant of :
  - ✓ Health in adulthood (e.g., decrease rate in coronary heart disease)
  - ✓ PA practice in adulthood (Sallis et al., 1992)

- However, youth PA level is globally insufficient:
  - ✓ In France, 69% of the school-aged children are not sufficiently active to meet the international guidelines of PA (Godeau, Navarro, & Arnaud, 2012)

How promoting PA in school-aged children?

- **Multicomponent** interventions that include both **school**, **family**, and **community** involvement have the potential to generate considerable increase in PA of school-aged children (van Sluijs, McMinn, & Griffin, 2007)

- Multicomponent intervention:
  - ✓ Both based on education and environment modification (van Sluijs et al., 2007)
- School involvement:
  - ✓ Ensure promotion of PA among all children, including those from lower socioeconomic classes (Simon et al., 2011)
- Family environment:
  - ✓ Key role of both parental support and shared family PA (Cleland et al., 2011)
- Community involvement:
  - ✓ Importance of the physical environment in which children and their family live (Sallis et al., 2006)

How promoting PA in school-aged children?

- **Some evidence exist** concerning the **beneficial impact on PA** of multicomponent interventions including school, family and community involvement (e.g., Mehtälä et al., 2014)

- **However**:
  - ✓ **Important variability** in term of effectiveness between programs (Methälä et al., 2014)
  - ✓ Few data exist concerning the **psychosocial mechanisms** implicated in the efficacy of such programs (van Stralen et al., 2011)
  - ✓ Few data exist concerning the identification of subgroups of children that are **more or less responsive** to those programs (kremers et al., 2007)

Objectives of the present (pilot) study

1. To assess the impact of a multicomponent intervention called the "*Great Challenge Live and Move*" on the **PA practice** of children aged from 6 to 12 years old

2. To assess the impact of the intervention on some **psychosocial determinants** of PA practice of the children proposed by the **theory of planned behavior** (Ajzen, 1991)

3. To evaluate to what extent the impact of the intervention **varied** according to **personal** (i.e., sex, age) and **environmental variables** (i.e., school class)

The "*Great Challenge Live and Move*": description of the intervention

- Duration = 1 month (May 2013)
- A playful method to help children to quantify their PA : **the « energy cube »:**

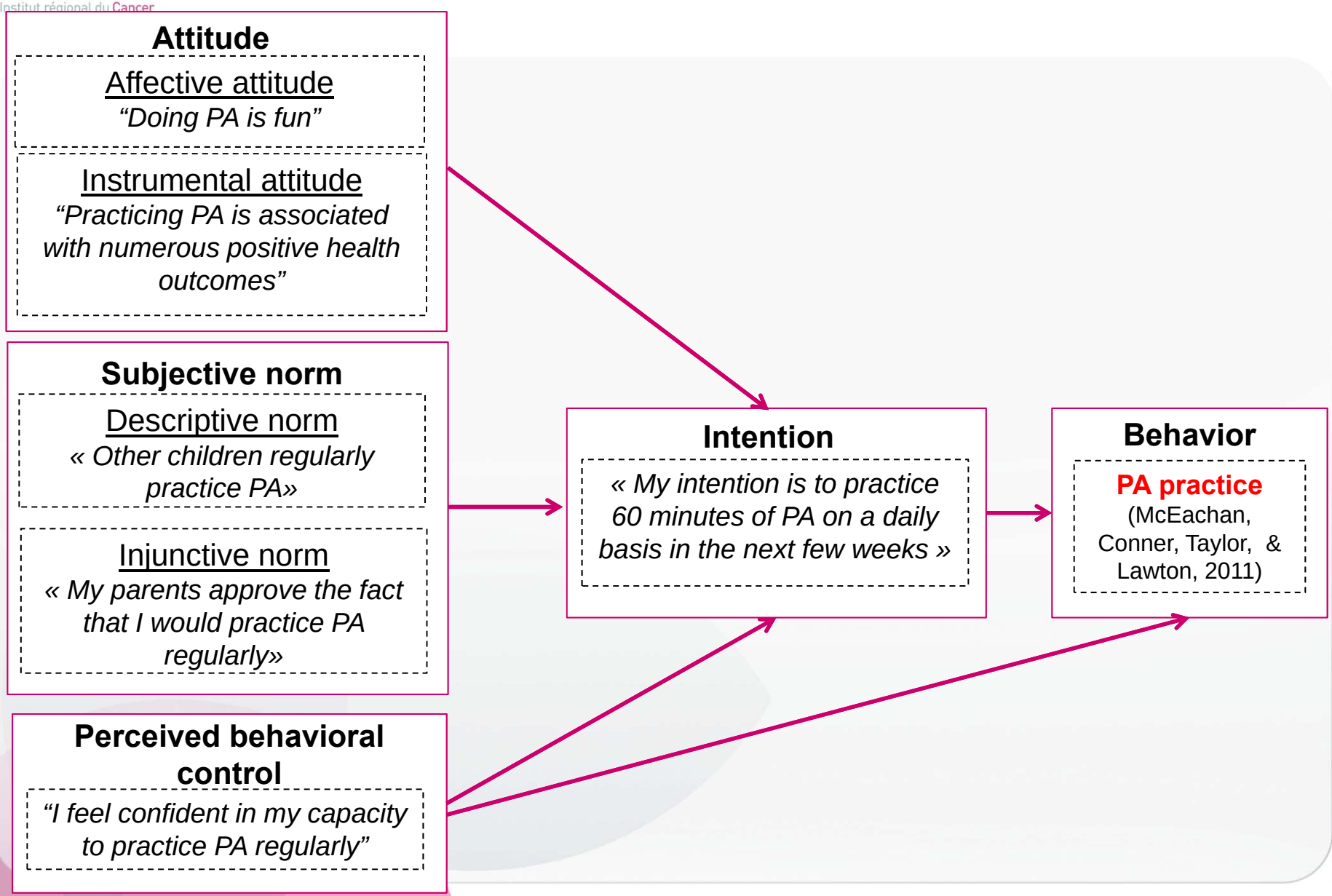
  - An energy cube = **15 minutes of PA**
  - Children monitor and report their energy cubes on a diary
- Provision of information on PA to the **children**
  - Current **PA recommendations**
  - **Benefits** of regular PA practice (e.g., source of enjoyment)
- Provision of information on PA to the **parents**
  - Importance of **parental support** (e.g., encouragement, feedback)
  - Importance of **shared family PA**
- Implementation of **"PA events"** (e.g., family hike)
  - One PA event per week end
  - In collaboration with **local policy stakeholders** (e.g., town councils, community of communes)

The theory of planned Behavior (Ajzen, 1991)

- The theory of planned behavior (TPB) is a **rational decision-making process model** which suggests that behavior is determined by numerous **potentially changeable cognitions** (Murtagh et al., 2012)

- Interest for the present pilot study:
  - Determining to what extent the "*Great Challenge Live and Move*" had an impact on **some of the proximal factors** of PA practice

The theory of planned Behavior (Ajzen, 1991)



Participants

- ✓ **306 children** from **17 classes** (10 public school from the community of commune of the Clermontais)
- ✓ **140 Girls**, **166 boys**
- ✓ Children from primary school-**year 2** (CE1) to **year 5** (CM2)
- ✓ Mean age = **8 years old** (SD = 1.6)

Method

- Measures
  - ✓ Instrumental and affective attitudes (Murtagh et al., 2012)
  - ✓ Injunctive and descriptive norms (Bélanger-Gravel & Godin, 2010)
  - ✓ Perceived control (Bélanger-Gravel & Godin, 2010)
  - ✓ Intention (Bélanger-Gravel & Godin, 2010)
  - ✓ Frequency of PA practice (Sallis et al., 1996)

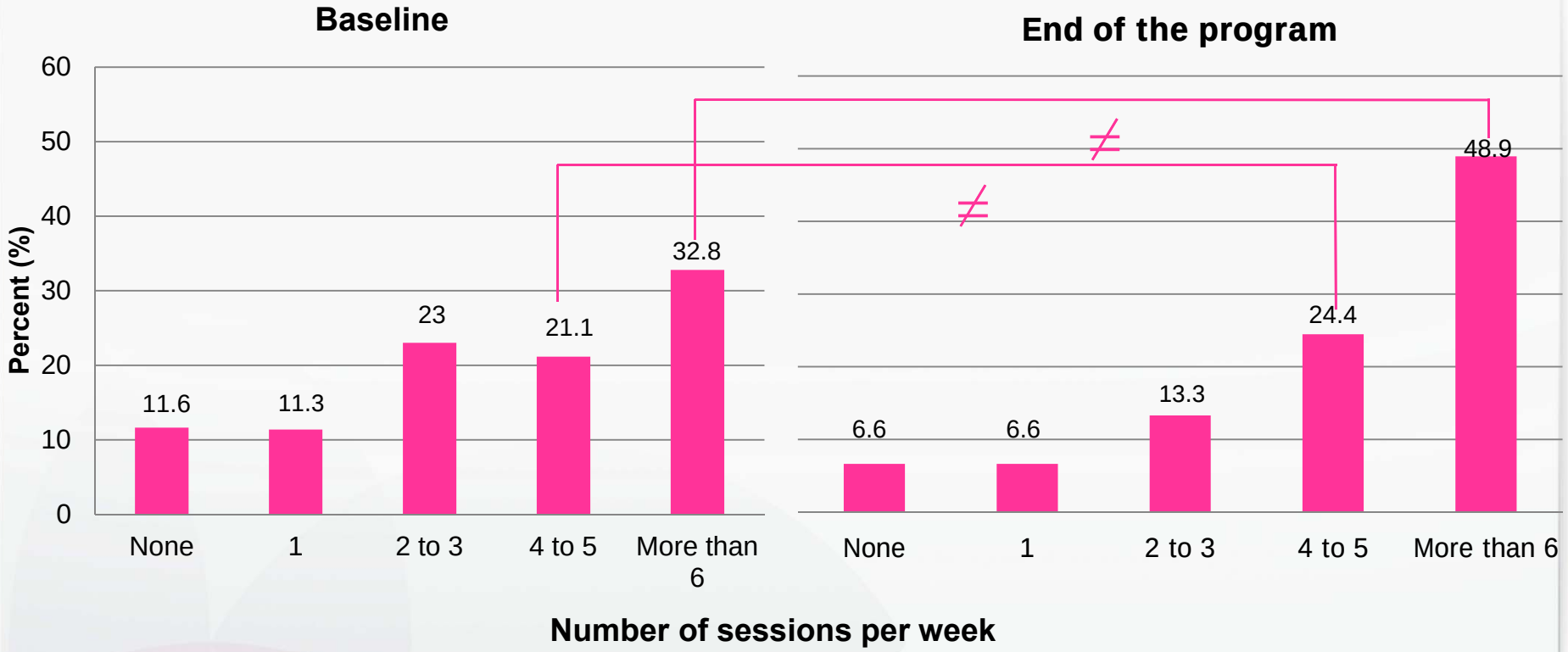
- Statistical analyses
  - ✓ Wilcoxon-rank test
  - ✓ Linear mixed models

Hypothesis 1

Children should **enhance their frequency of PA practice** after their participation to the « *Great Challenge Live and Move* » (i.e., a multi component intervention that include both school, family, and community involvement) (Mehtälä et al., 2014)

Results (1)

Frequency PA sessions among children



Wilcoxon signed-rank test = $p < 0.001$

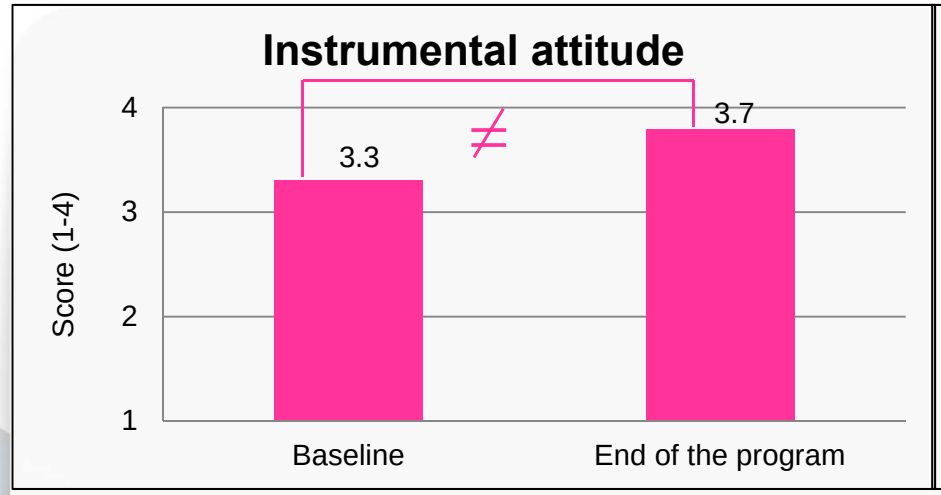
Hypothesis 2

Given **the components** of the « *Great Challenge Live and Move* », children should **enhance** their score on **the TPB variables** :

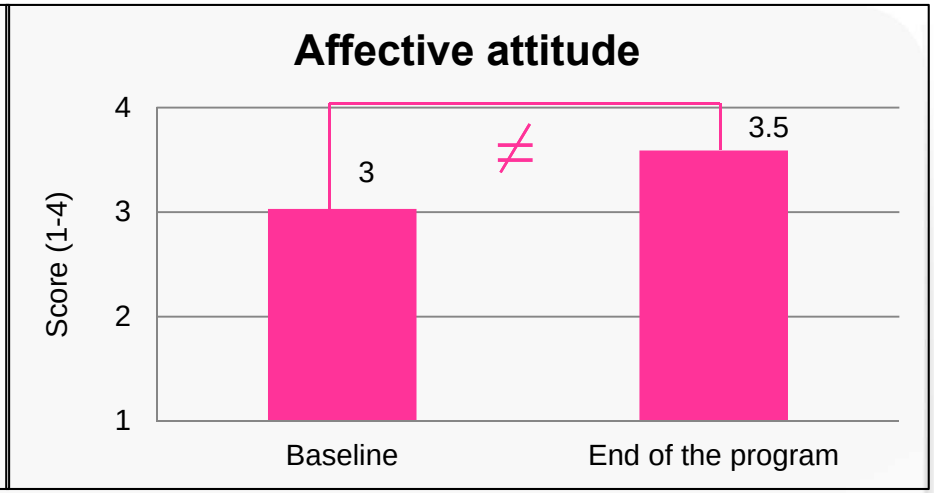
- ✓ Benefits of PA → **Attitudes** and **intention** (Chatzisarantis & Hagger, 2001)
- ✓ Self-monitoring (energy cubes) → **Perceived behavioral control** (Gleeson-Kreig, 2006)
- ✓ Provision of information on PA to the parents → **Perceived norms of the children** (Dunn et al., 2001)
- ✓ PA events → **All variables** (Peddle-McIntyre et al., 2013)

Results (2)

Attitudes

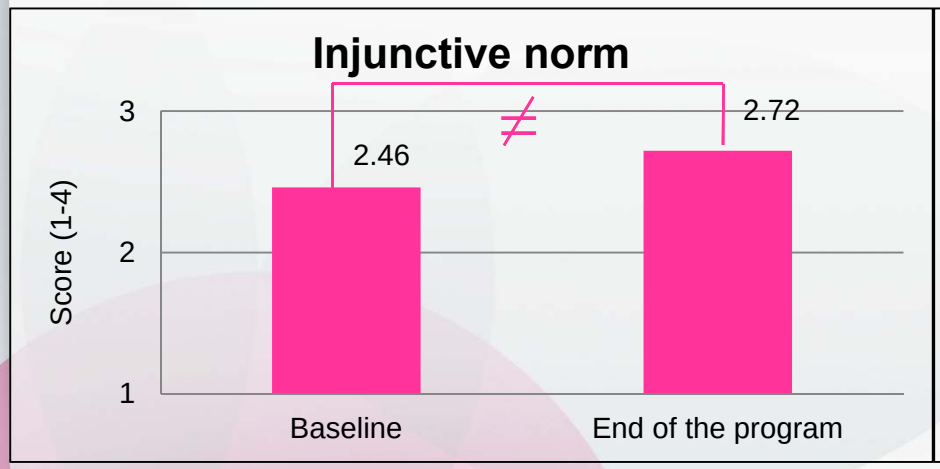


p<.001

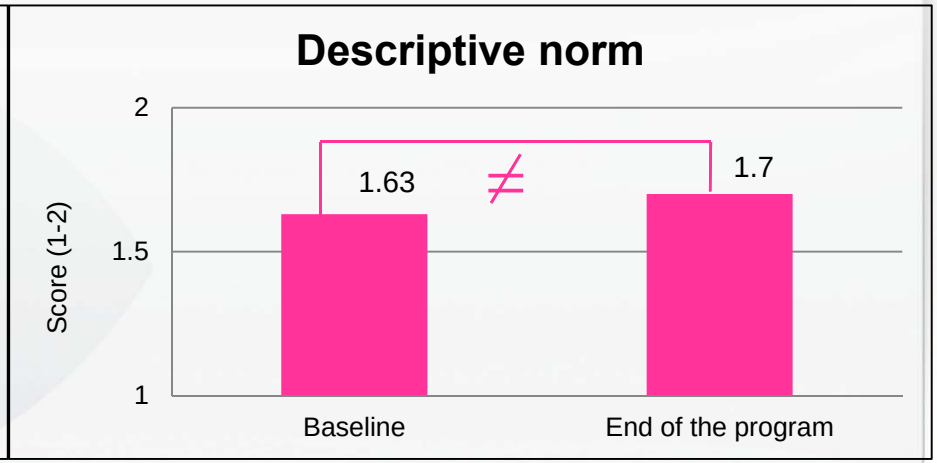


p<.001

Norms



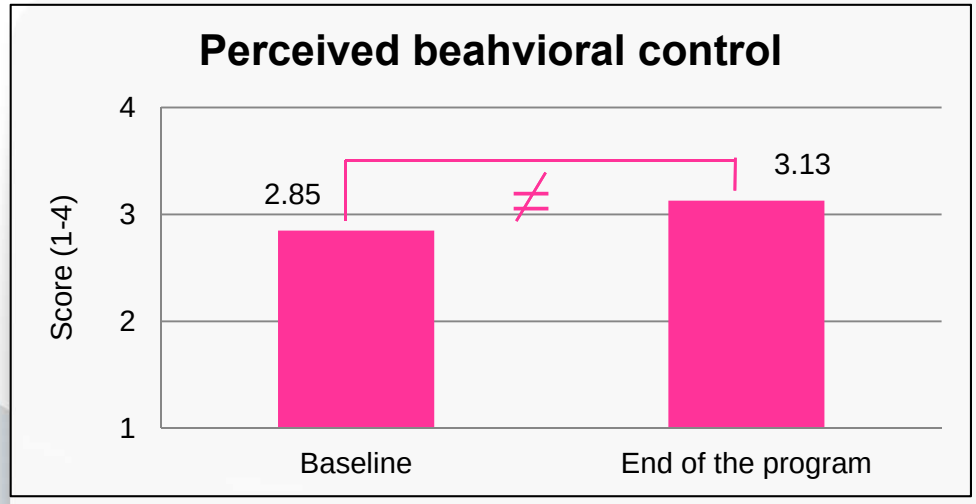
p<.001



p<.05

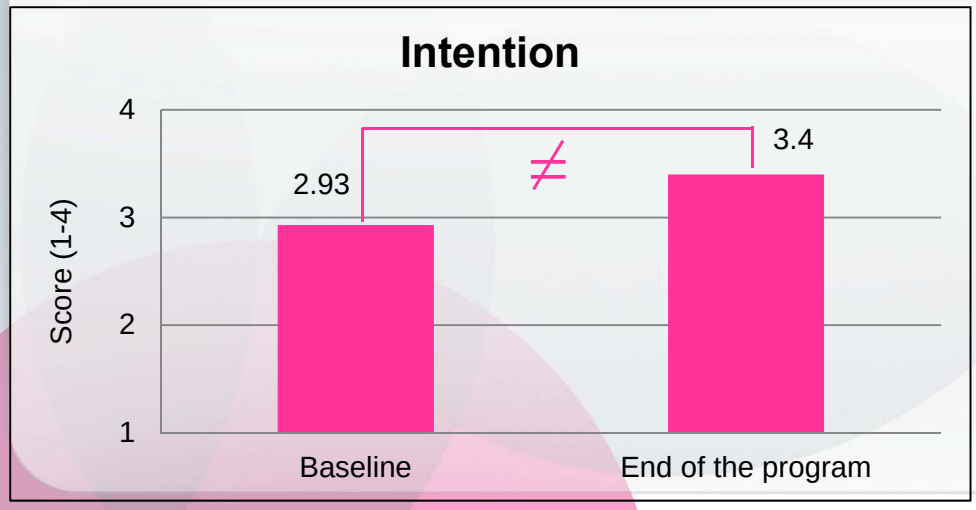
Results (2)

Perceived behavioral control



p<.001

Intention



p<.001

Hypothesis 3

According to the existing literature, the "*Great Challenge Live and Move*" could have an higher impact on:

- ✓ **Girls** (Kremer et al., 2007; Yildirim et al., 2011)
- ✓ **Younger children** (Yildirim et al., 2011)

Results (3): Personal variables

Sex of the children:

	Girls Mean (SD)	Boys Mean (SD)	p-value
Variation of intention (%)	29.4 (58.3)	35.1 (73.6)	0.28
Variation of instrumental attitude (%)	30.9 (61.0)	28.2 (60.9)	0.77
Variation of affective attitude (%)	42.7 (73.3)	30.6 (64.5)	0.09
Variation of injunctive norm (%)	17.9 (51.8)	25.7 (59.9)	0.25
Variation of descriptive norm (%)	6.3 (19.0)	5.5 (17.8)	0.68
Variation of perceived behavioral control (%)	26.6 (76.5)	22.3 (56.9)	0.65
Variation of PA frequency (%)	55.4 (123.3)	35.5 (87.6)	0.09

No ≠ between **girls** and **boys**

Age of the children:

	β	95% CI
Variation of Intention (%)	-5.46	-11.26 ; 0.33
Variation of instrumental attitude (%)	-7.46	-12.01 ; -2.91
Variation of affective attitude (%)	-5.58	-10.68 ; -0.47
Variation of injunctive norm (%)	-1.66	-5.79 ; 2.47
Variation of descriptive norm (%)	0.77	-0.58 ; 2.11
Variation of perceived behavioral control (%)	-8.79	-13.91 ; -3.67
Variation of PA frequency (%)	-8.10	-17.63 ; 1.42

Younger children report higher increase for **attitude** and **behavioral control**

Results (3): environmental variable

Variance explained by school class for the evolution of the variables :

	Pre-intervention Mean (SD)	Post-intervention Mean (SD)	School class ICC
Intention	2.9 (1.0)	3.4 (0.7)	0.16
Instrumental attitude	3.3 (0.9)	3.8 (0.4)	0.11
Affective attitude	3.0 (1.0)	3.6 (0.8)	0.12
Injunctive norm	2.5 (0.8)	2.7 (0.8)	0.13
Descriptive norm	1.6 (0.2)	1.7 (0.3)	0.00
Perceived behavioral control	2.9 (1.0)	3.1 (0.9)	0.22
PA frequency	3.5 (1.4)	4.0 (1.3)	0.14

School class explained a meaningful variance in the evolution of **intention**, **perceived control** and **PA**

Discussion

- Impact of the « *Great Challenge Live and Move*» among **children** (aged from 6 to 11 years old):
  - ✓ Take into account the **multiple level-factors** that influence PA practice (Mehtälä et al., 2014)
  - ✓ Toward a better understanding of the **explicative mechanisms** implicated in the efficacy of interventions (Annesi & Whitaker , 2010)
  - ✓ Presence of a "**school class effect**" for some variables

- Some originalities:
  - ✓ **Ludic aspect** of the « energy cubes » to monitor PA practice
  - ✓ An intervention that promotes **family bonds**

Limits and perspectives

- Main limits:
  - ✓ Absence of an **objective PA measurement** (e.g., accelerometer, pedometer)
  - ✓ Absence of a **control group**
  - ✓ No test of a **mediation effect**

- Perspectives:
  - ✓ Implementing a **randomized controlled trial**
  - ✓ Determining the **longer impact** of the intervention (6-12 months)
  - ✓ **Integrating new components** in the intervention that are hypothesized to have an impact on the TPB variables (e.g., Michie & Abraham, 2004)

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