

# Assessment using e-Health technologies in pediatric psychology: Developing an App on iPad for the Quality of Life Systemic Inventory for Children (QLSI-C)



Toucheque, M.<sup>1</sup>, Tilkin, C.<sup>1</sup>, Dupuis, G.<sup>2</sup>, & Etienne, A-M.<sup>1</sup>

<sup>1</sup> Psychology and Clinic of Human System Department, University of Liege, Liege, Belgium

<sup>2</sup> Human Sciences faculty, Department of psychology, University of Quebec, Montreal, Canada

Contact information: Malorie Toucheque – mtoucheque@ulg.ac.be

## INTRODUCTION

\* **Integration of e-Health technologies for purposes of assessment** in pediatric psychology offers a number of advantages:

1. Lots of children are familiar with new technology and enjoy using it
2. Incorporation of colors, smileys, graphics and sounds to make it fun to complete
3. Fast, simple and convenient testing
4. Electronic scoring: no more manual data entry, reducing transcription errors as well as researcher workloads

\* **Thus, the usual paper-administration of the QLSI-C has been replaced by an iPad administration**

1. QLSI-C (Etienne, Dupuis, Spitz, Lemetayer & Missotten, 2011) is a self-report measure of quality of life for children aged 8 to 12 years using a Visual Analog Scale
2. The theoretical model underlying the QLSI-C is based on this notion of discrepancy and the Aristotelian notion of happiness. In this model, all human activities are oriented towards an end (a goal), that certain ends are subordinated to others but that the ultimate end is the pursuit of happiness. Thus, concepts of goals or expectations are core elements of the QLSI-C. No previous child-focused tool has included these notions

## OBJECTIVE

Purpose of this study is to assess and compare the paper and iPad mode of QLSI-C administration by analyzing:

1. Score equivalence between paper and iPad administration
2. Internal consistency of both modes of administration
3. Test-retest reliability of the iPad administration

## RESULTS

### SCORE EQUIVALENCE

ANOVA: No significant group, time or interaction effect for gap and goal scores.

Despite the interaction effect for the rank score, analysis of Post Hoc test showed no significant differences between groups for the rank score.

	PAPER $\alpha$	IPAD $\alpha$	$p^*$
QLSI-C goal	.91	.92	.64
QLSI-C rank	.82	.79	.32
QLSI-C gap	.77	.80	.67

\*Based on Feldt

### INTERNAL CONSISTENCY

	IPAD TO M(SD)	IPAD T1 M(SD)	p	Pearson r	ICC
QLSI-C goal	7.59 (6.55)	6.26 (6.64)	.53	0.72	.97
QLSI-C rank	1.59 (0.16)	1.61 (0.18)	.92	0.66	.87
QLSI-C gap	2.55 (4.52)	2.38 (6.13)	.71	0.69	.90

### TEST-RETEST RELIABILITY

## METHOD

### Participants

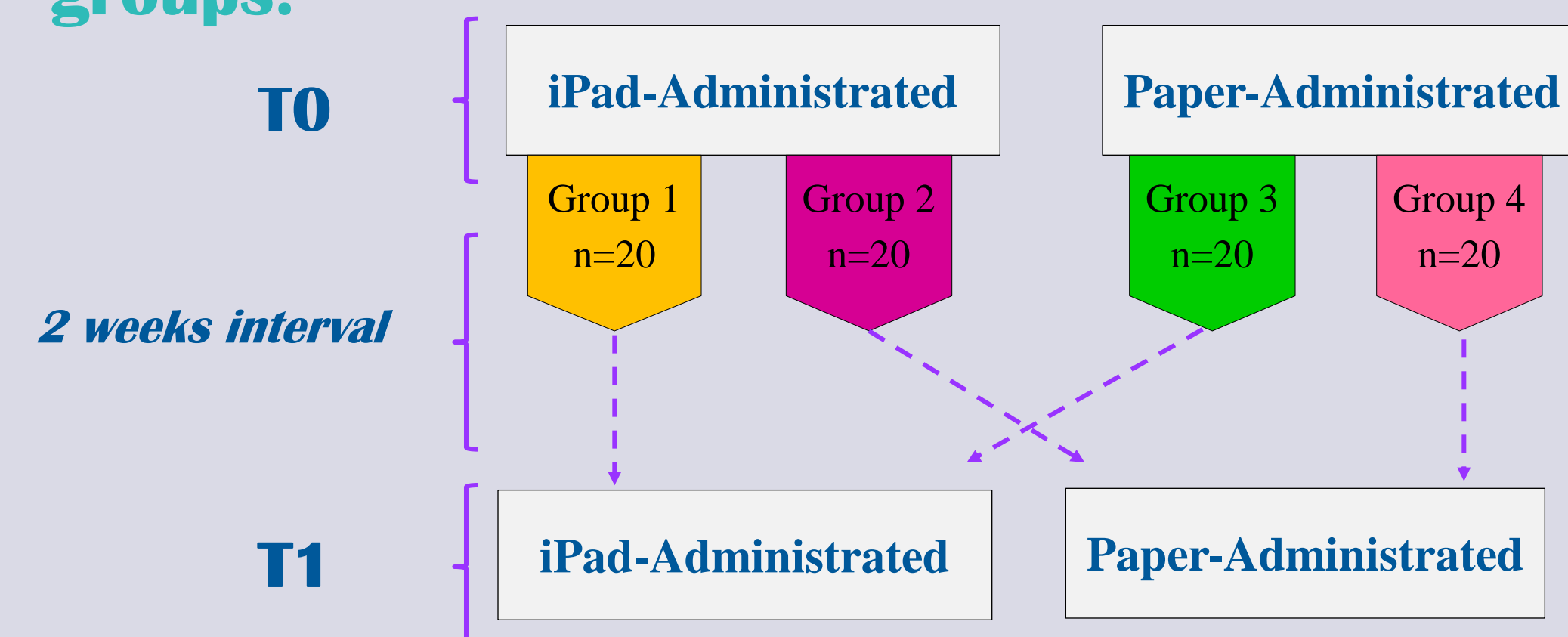
80 children from 6 Belgian elementary school participated to this study. Mean age is 9.75 (SD=1.53) with 50% male.

### Material

- **Quality of Life Systemic Inventory for Children**
  - 20-items scale: domains of life covering the child's physical, emotional, cognitive, social and family functioning.
  - **QOL** = difference (*gap score*) between the present situation (*state score*) and the child's expectations (*goal score*), weighted by the speed of improvement or deterioration (*Speed score*) and the importance (*rank score*) assigned for each life domain.
  - Only the most meaningful score will be examined: Goal – Rank – Gap

### Procedure

- **Crossover study design with randomly assignment in 4 groups:**



### Statistical analyses

- **Score equivalence**
  - Mixed design Analysis of Variance (4X2)
  - Post hoc Bonferroni
- **Internal consistency**
  - Cronbach's alpha
  - Feldt's statistic
- **Test-retest reliability**
  - Student's T Test
  - Pearson Correlation analysis
  - Intraclass coefficient (ICCs)

## Example: item 1 – iPad administration

1. **SITUATION:** The child indicates on the circle :

- a) his/her current **STATE** ("how happy are you NOW?") with a full arrow and
- b) his/her personal **GOAL** ("Where would you like to be?") with a dotted arrow.

These arrows are positioned in reference to the ideal situation, which is the same for everyone.

2. **EVOLUTION:** the child indicates whether she/he thinks that, in the last few days, **her/his current situation has been stable or is moving closer or away from the ideal situation.** If the situation is improving or deteriorating, the child has to specify the speed of improvement or deterioration and choose between the following possibilities: a walker, a cyclist, a care or a plane

→ (**SPEED score**)

3. **IMPORTANCE:** the child indicates, on a 5-point Likert Scale, **how important each domain is to her or him**

→ (**RANK score**)

## DISCUSSION

FINDINGS SUGGESTED:

- \* **Equivalence between paper and iPad modes of administration**
- \* **Adequate internal consistency reliability**
- \* **Good temporal stability of the iPad administration**

**In summary,**

the iPad format of QLSI-C appears valid in comparison to the original paper format. This technology approach to assessment is more attractive for children, decreases time for administration, and enhances the ease of scoring. Thus, these advantages might encourage both clinicians and researchers to consider using e-Health developments in assessment in pediatric psychology.