



Mirror therapy using IVS 3 device in children with Unilateral Cerebral Palsy

A feasibility study

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Context



Bought in 2023 by the
peadiatric PMR department



How tu use it with children ?
Which difficulties ? Limits?

Background



Clinical experience with post-stroke adults but nothing with children.



Mirror therapy using classical material was studied but not with the IVS 3 device

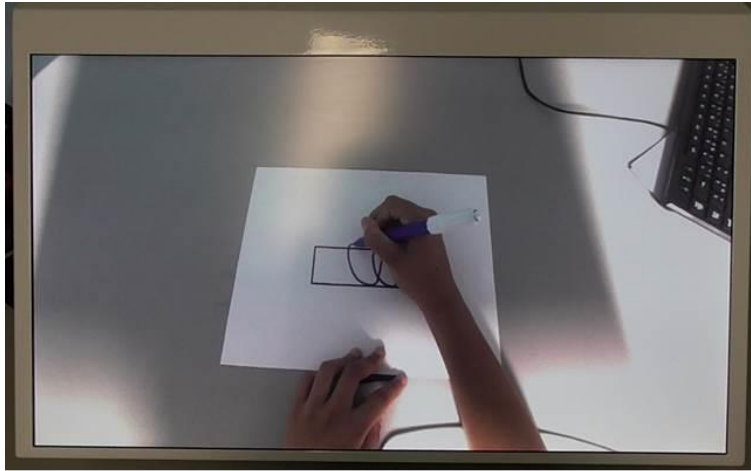
Objective

1st To test the feasibility of an unique session with the IVS 3 device

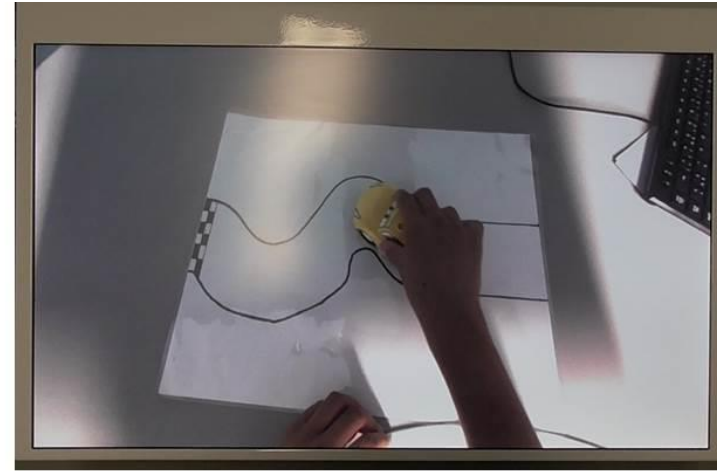
What were the parameters to favorise in children ?

2nd What was the level of illusion feels by children ?

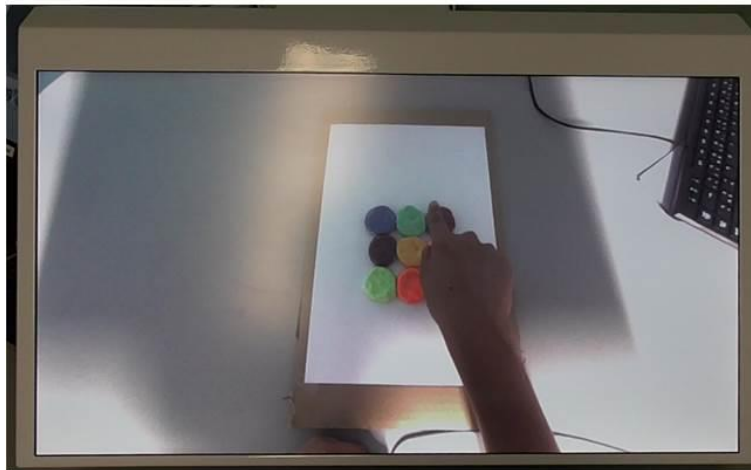
Method



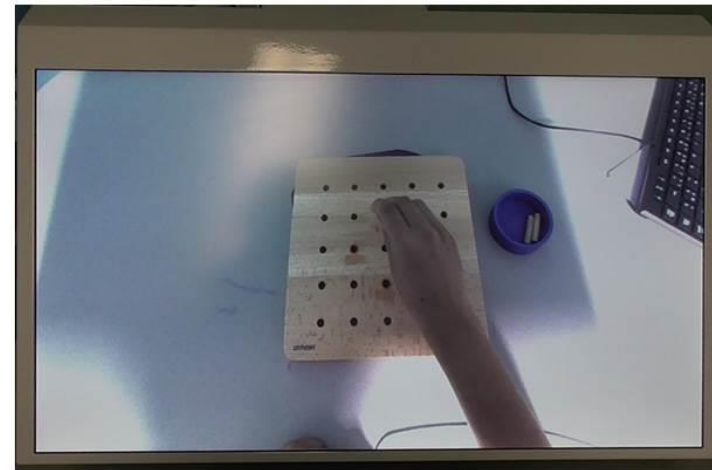
1. graphical exercise



2. movement exercise

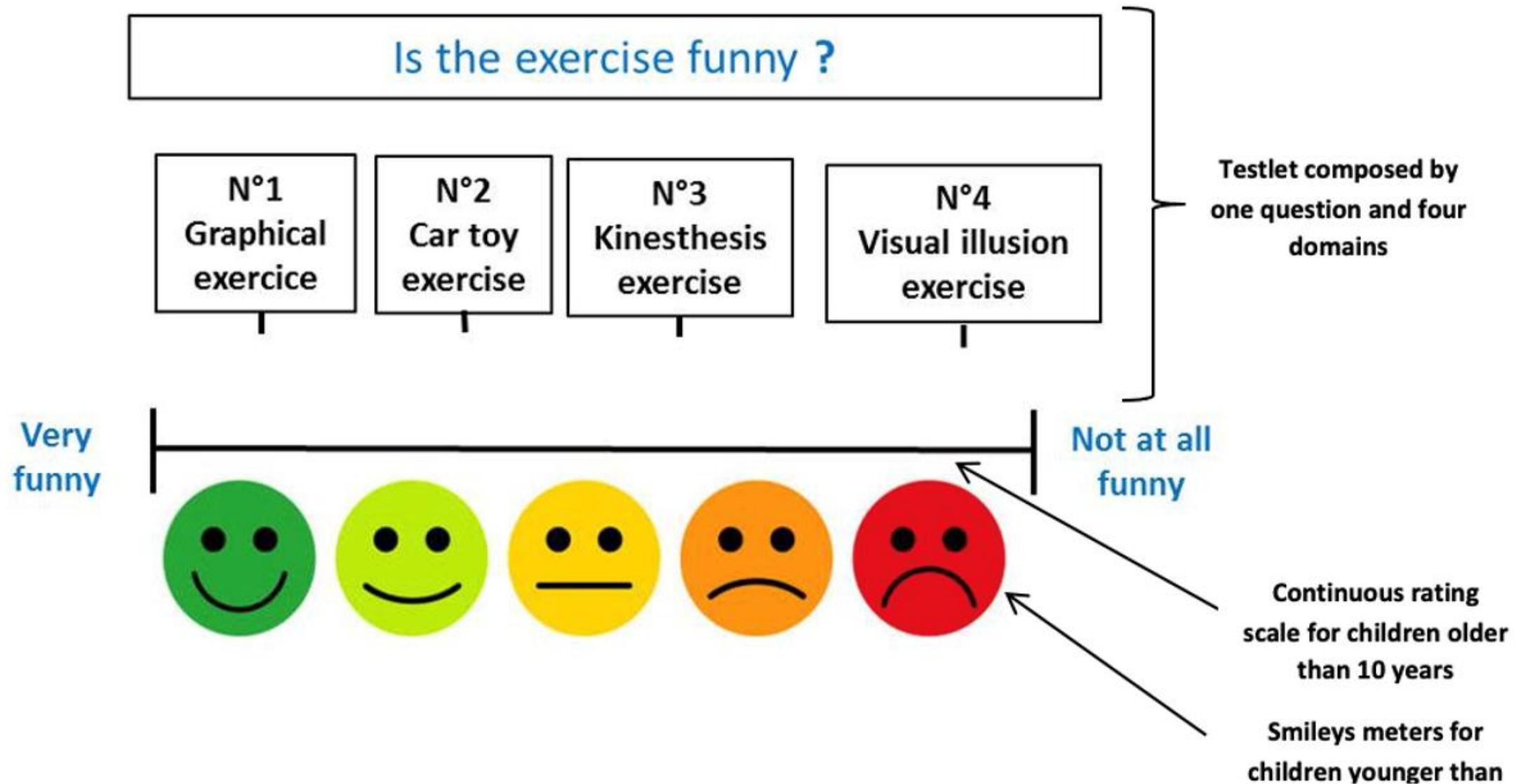


3. Kinesthesia exercise



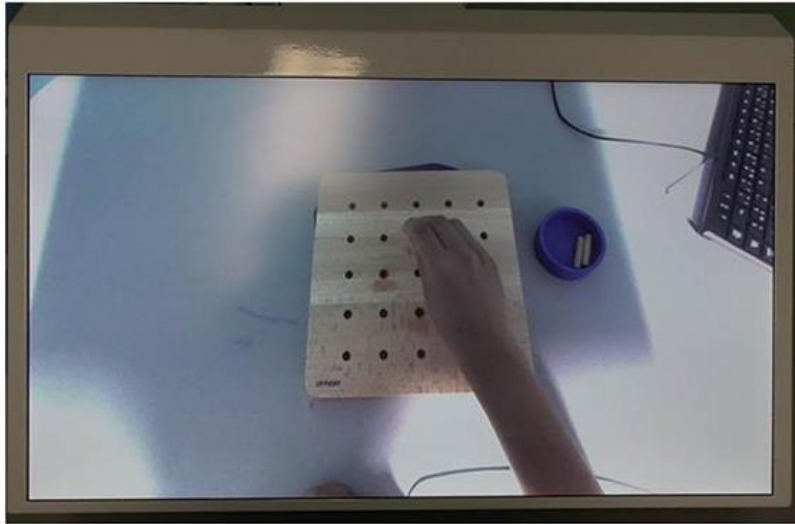
4. Visual illusion exercise

Method



Example of query using visual analogic scale-for rating, ranking and paired-comparison (VAS-RRP, Sung et al. 2018)

Method



4. Visual illusion exercise



KVIQ 10

How do you feel the action ?

10 As intense as executing the action

7.5 Intense

5 Moderately intense

2.5 Mildly intense

0 No sensation

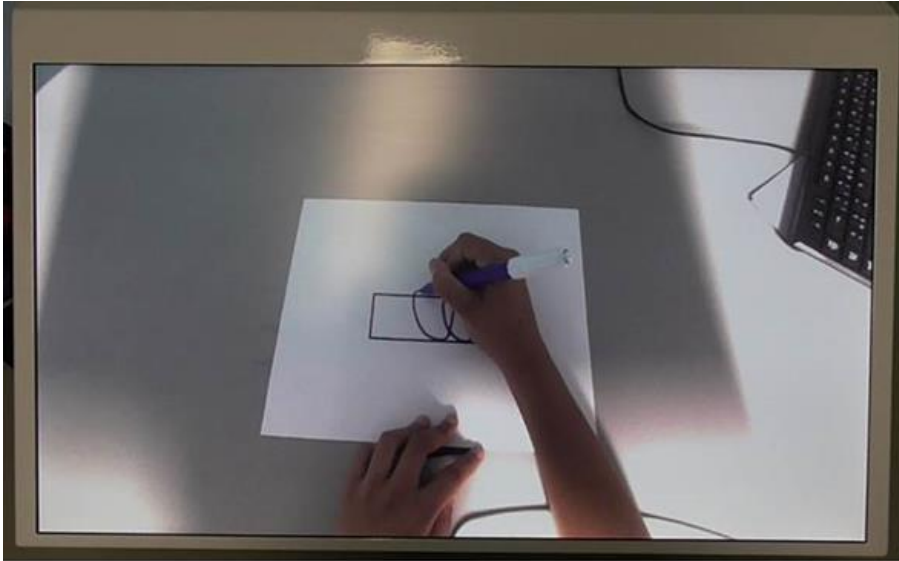
Results

	CP n=11	Control n=11	<i>p value</i>
Age (years)	13.2 (2.4)	8.1 (1.7)	<0.001
Height (cm)	159 (14.1)	130.2 (11)	<0.001
weight (kg)	46 (8.6)	27.3 (5.7)	<0.001
Time session (min)	8,2 (1,3)	8.2 (1.7)	0.8
dominant side (right/left)	5/6	10/1	/
paretic side (right/left)	6/5	/	/
MACS (n)	I (5), II (4), III (1), IV (1)	/	/

Results

Thematic area	CP	Control	<i>p value</i>
a) device functioning	5.9 (1.6)	7.5 (2.3)	0.06
b) ergonomic design	6.7 (2.8)	7.9 (1)	0.43
c) exercises*	6.5 (1.1)	7.4 (1.2)	0.1
d) effort level*	6.5 (2.4)	5.8 (2)	0.34
e) motivation	7.4 (1.9)	7.5 (1.9)	1
Illusion of movement KVIQ 10	5.9 (3.8)	6.1 (3.6)	0.92

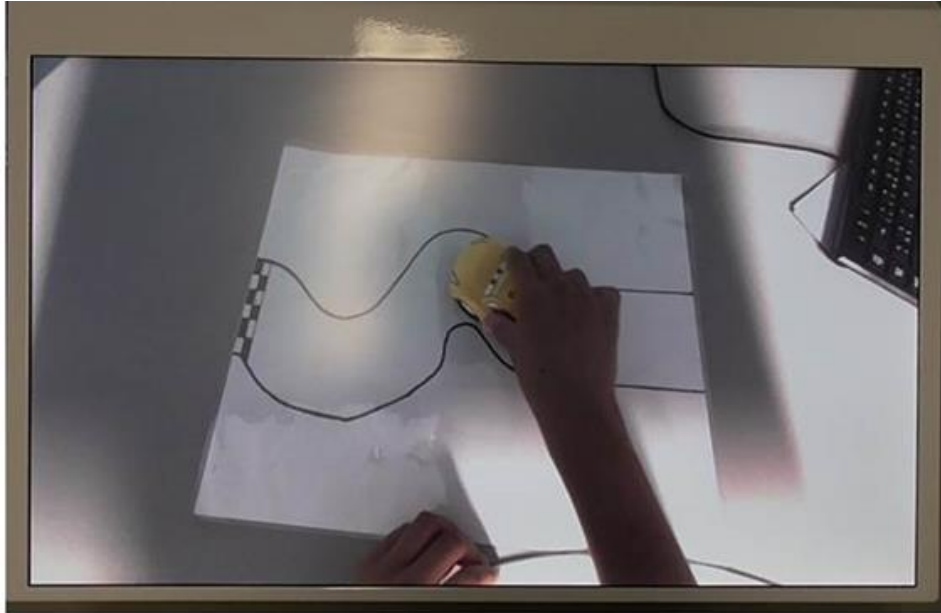
Results



1. graphical exercise

Children with UCP found this exercise longer than TD peers (6 (1.6) versus 8.4 (2), $p=0.02$)

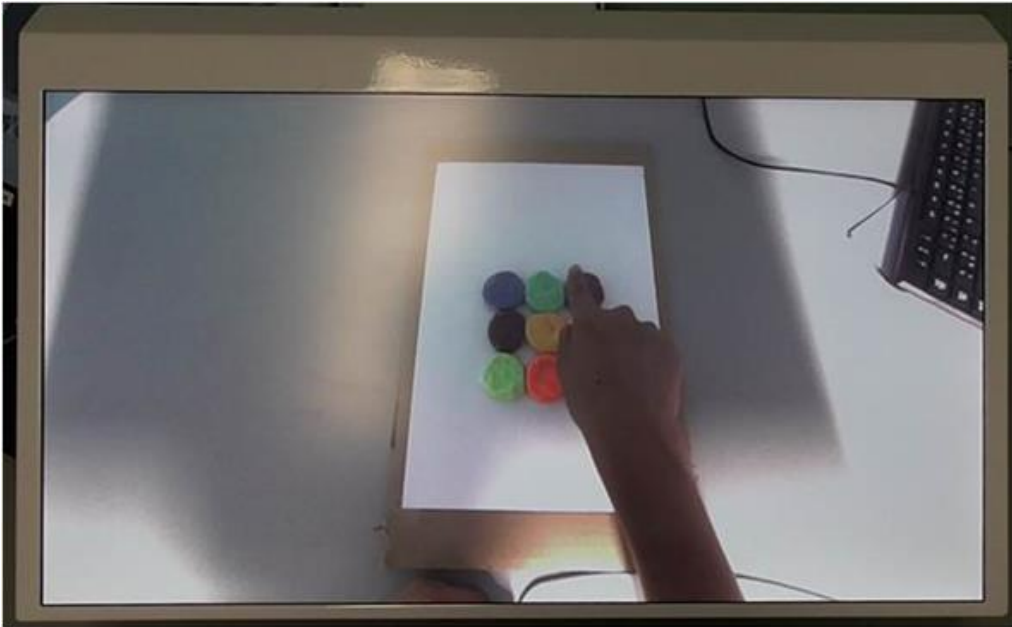
Results



2. movement exercise

**The easiest and the more
fun for all children**

Results

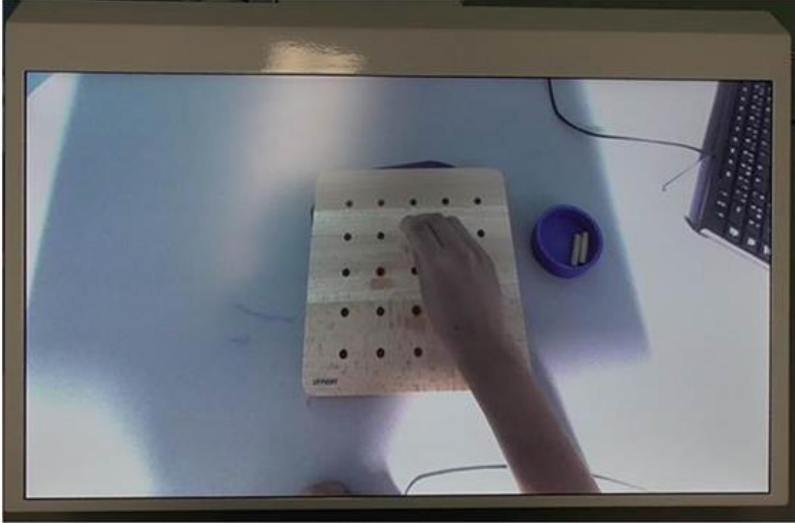


3. Kinesthesia exercise

**Moderate score
(5.3 (2) versus 4.8 (2.6))**

**Difficult for children even
without motor impairment.**

Results



4. Visual illusion exercise

KVIQ 10

How do you feel the action ?

- 10 As intense as executing the action
- 7.5 Intense
- 5 Moderately intense
- 2.5 Mildly intense
- 0 No sensation

**No difference for the KVIQ 10
Between UCP and TD peers**

**But not easy for TD children (6.4 (2))
And more difficult for children with
UCP (4.2 (2.5)) ($p=0.03$)**

Conclusion

- Few differences between UCP and TD Children
- Playful exercises could be favored
- Number of repetitions for fine dexterity exercises must be limited (3 to 5 repetitions)
- Exercise with only visualisation of movement were difficult: limited number of repetition.
- Time session around 8 min appeared adapted
- Children with low to moderate motor impairment (MACS I to III)