

# MUSAPDYS

## ANR- NEURO, 2007 (024 - 01)



### Influence of musical training on language processing in children

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#### Objectives

Examine the influence of musical training on different levels of language processing:

1. Pre-attentive syllabic processing (MMN)
  2. Speech segmentation (Statistical learning)
  3. Speech in noise perception (being processed)
  4. Speech comprehension (being processed)
  5. Writing
- Study brain plasticity in children  
 -- Compare Normal Readers (NR) and dyslexics (Dys)

#### Method: Longitudinal approach (2yr)

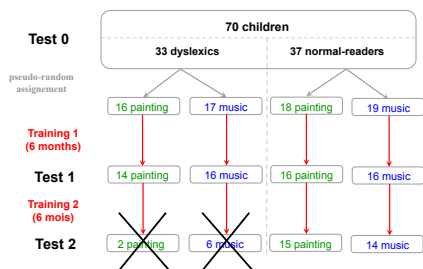
#### Test - Training – ReTest procedure

#### T0 (pre-training; Sept-Oct 2008):

Standard Neuropsychology tests  
 Experiments 1 to 5 above

Based on results at T0 -> **pseudo-random assignment** to music or painting training

#### Training (Nov 08 – May2009):



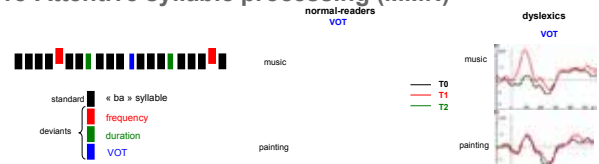
**Test 1 (June 2009):** Same tests as in T0

**Training (Sept 09 – Mai 10):** Music or painting

**Test 2 (June 2010):** Same tests as in T0 and T1

#### Results - Discussion

##### Pre-Attentive syllabic processing (MMN)



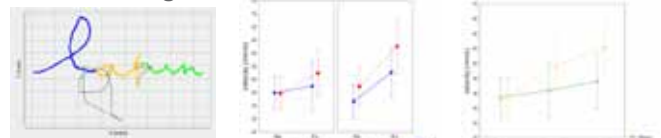
→ Effect of musical training on MMN amplitude for duration and VOT deviants in normal-reading children and for VOT in children with dyslexia

##### Speech segmentation



→ Effect of musical training on speech segmentation performance in normal-reading children

##### Handwriting



→ Effect of painting training on handwriting speed in dyslexic and normal-reading children

#### Main Publications

Besson, Chobert, Marie (2011). Transfer of Training between music and speech: common processing, attention or memory? *Frontiers in Auditory Cognitive Neuroscience* (sous presse).

Besson, Chobert, Marie (soumis). Language and Music in the Musician Brain. *Linguistics and language compass*.

Deguchi, C., Chobert, J., Brunellière, A., Nguyen, N., Colombo, L. & Besson, M. Pre-attentive and attentive processing of French vowels. *Brain Research, Brain Res.* (2010), doi:10.1016/j.brainres.2010.09.104

Chobert, Marie, François, Schön & Besson (2011). Enhanced preattentive and attentive processing of syllables in musician children. *Journal of Cognitive Neuroscience* (sous presse).

Chobert, François, Habib & Besson. (soumis). Deficit in the pre-attentive processing of syllables in children with dyslexia. *Neuropsychologia*.

Francois & Schön (2010). Learning of musical and linguistic structures: comparing event-related potentials and behavior. *Neuroreport*, 21, 928-32..

Francois & Schön (2011). Musical expertise boots implicit learning of both musical and linguistic structures. *Cereb. Cortex*. (sous presse).

Francois, Chobert, Besson & Schön (soumis). Music training for the development of language acquisition. *Proc. Nat. Ac. Sc.*

Marie, C., Kujala, T. & Besson. Musical and linguistic expertise influence pre-attentive and attentive processing of non-speech sounds, *CORTEX* (2010), doi: 10.1016/j.cortex.2010.11.006

Marie, C, Magne, C. & Besson, M. (2010). Musicians and the metric structure of words (2010). *Journal of Cognitive Neuroscience*, Vol. 23(2), pp. 294–305.

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