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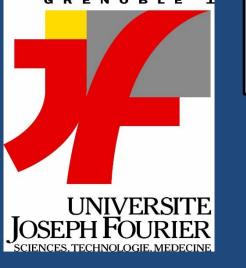
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# Early identification and intervention to prevent reading difficulties -A longitudinal study on french-speakers at kindergarten-





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Background: What can be done at school to reduce the number of children having difficulties in learning to read, especially those considered at risk for academic under-achievement, such as those who live in poverty ? This research seeks to identify early predictors of reading in French children from low-income families, and to develop and test the efficacy of 3 different reading training programs to 5 years old children. What are their direct and indirect effects on later reading? Are they limited to what have been trained or have they a more general effect? Do their benefits maintain over a one year period of reading instruction, when children finish grade one?

Nethod: A control group is compared to 3 experimental ones which benefit from 3 pre-reading programs. Both experimental groups received 1 or 2 training sessions a week during 20 weeks, in small groups of 4 to 6 children. Tuitions are delivered by trained teachers in their class.

	Trainings at kindergarten		
<b>T1</b>	G1 - phonological awareness	<b>T2</b>	Т3
5 years	G2 – successive and simultaneous processes	5,9 years	6,9 years
Beginning Kindergarten	G3 – metacognition	End Kindergarten	End Grade 1
	G4 – control group		

**Tainings**. **G1** = meta-phonological program fostering on phonem awareness, letter-sound syllabe, rhyme, correspondance. G2 = training simultaneous or successiveprocesses on visual and phonological stimuli. G3 = training metacognition while comparing and categorising visual and phonological stimuli.

Fields	Tests	<b>T1</b>	<b>T2</b>	Т3
Non-verbal reasoning	<b>Raven's Coloured Matrices</b>	+	+	+
	Planning tests: matching numbers,	+	+	+
	planned codes	+	+	+
Information processin	Attention tests: number detection,	+	+	+
(Das & Naglieri Cognitive	expressive attention	+	+	+
Assessment System)	Simultaneous tests: figure memory,	+	+	+
	verbal-spatial relations	+	+	+
	Successive tests : speech rate,	+	+	+
	words series	+	+	+
Short-term memory	Digits span	+	+	+
Base of knowledge	Vocabulary	+	+	+
Compréhension	Oral and reading comprehension		+	+
Métaphonology	Phonological awareness	+	+	+
School achievement	Reading, spelling, comprehension, mathematics			+

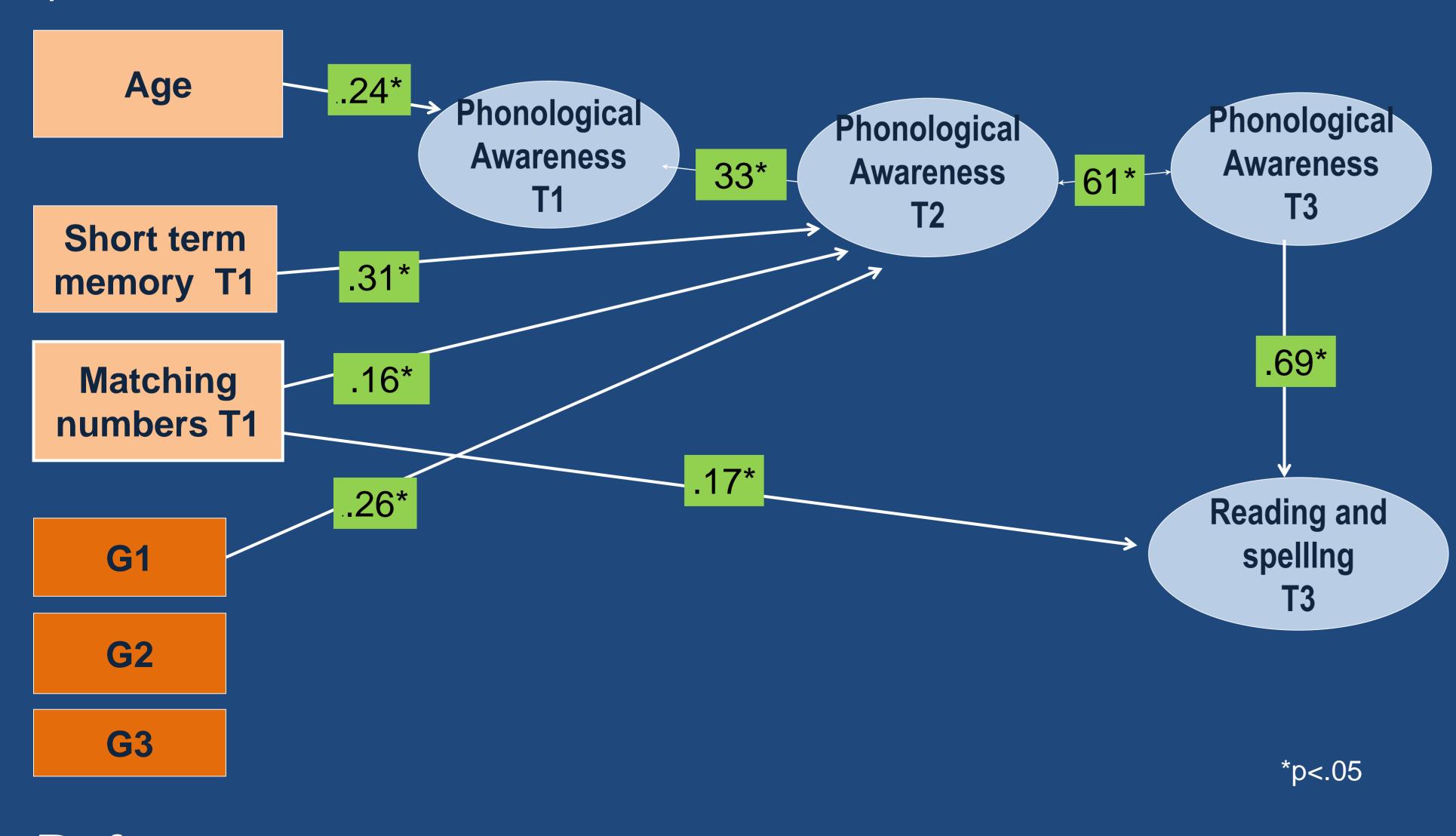
Participants: 396 preliterate 5 years old french speakers kindergarteners are divided in 4 groups. As groups were not strictly equivalent at the beginning of the study, children were matched 4 by 4, on age, Raven and vocabulary. Analysis are conducted on these 4 groups of 37 children (N=148).

Parental Occupational Status is controled and is homogenous between groups recruited in urban special

## needs education areas.

Assessment: At three points in time over a 2 years period the children were submitted to standardized cognitive and linguistic tests given individually. At T3: addition of tasks measuring academic achievement in French and mathematics.

Results: 5 years old children, from low income families, considered at risk for reading difficulties can benefit from early interventions at school. But programs have differential effects in the short and medium-term and all are not helpfull: G2 is rarely different from the control one. The analysis performed with the EQS program give the structural organisation below  $(\chi^2 = 480, p < .001, GFI = .92, CFI = .88, RMSEA = .13)$ .



### Training:

A meta-phonological program has a positive direct effect on phonological awareness (PA) and a indirect effect on reading and spelling skills at Grade 1. A program focusing on metacognition has no direct

effect on PA and on decoding at Grade 1 (but it has one on comprehension).

No positive effect of these programs on mathematics at Grade 1...

**Predicting:** PA at T3 determines a large part of reading and spelling. Early PA and short term memory have an indirect effect on later reading and spelling. An outsider for reading acquisition: matching numbers? This test predict at 5years a part of reading performance at Grade 1 independently of phonological awareness and short term memory. This visual analysis of digit strings task can be an indicator of visual attention span (= number of distinct visual elements which can be processed in parallel). Further research is required to investigate this hypothesis.

Ref: Bianco, M., Bressoux, P., Doyen AL., Lambert, E., Lima, L., Pellenq, C, Zorman, M. Early training in oral comprehension and phonological skills: results of a three-year longitudinal study. (submitted). Cèbe, S., Goigoux, R., Bailleux, C., Pellenq, C., Paour, J. L., Blaye, A., Gilles, P. Y. (2003). L'influence des pratiques à l'école maternelle sur l'apprentissage de la lecture au cours préparatoire. Les Dossiers des Sciences de l'Education, 10, 77-92.