Project METACHILD
Promoting metacognition in young children, a lever to reduce educational inequalities?

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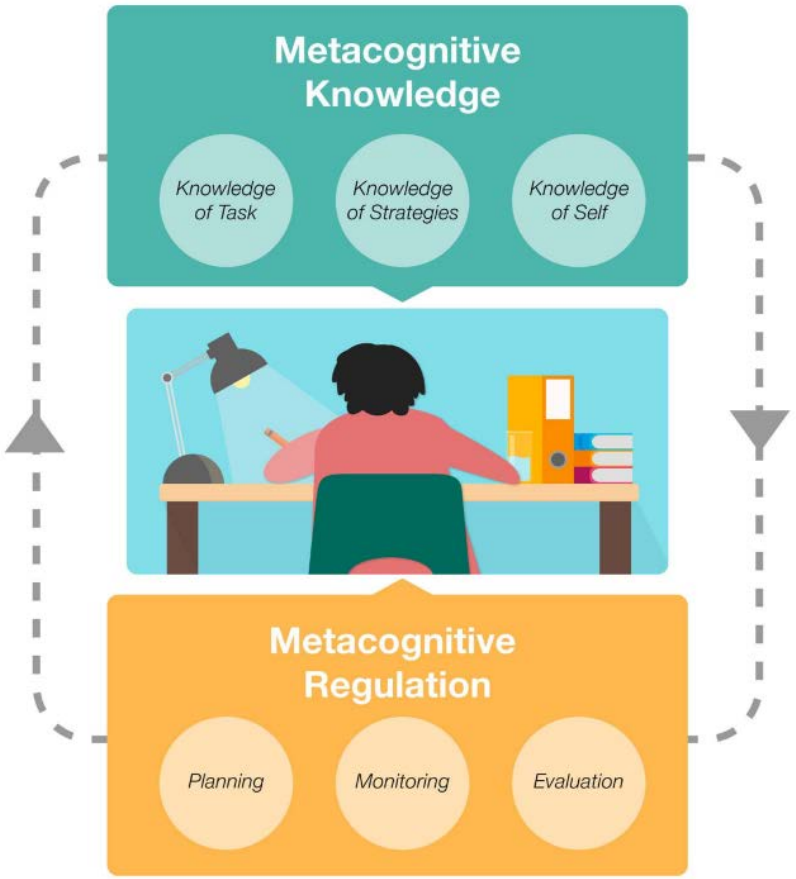
DEFINITION

Metacognition

Knowledge and regulation skills involving reflexivity about one's own cognitive processes

(Flavell, 1979; Flavell et al., 2002)



Education Endowment Foundation (2023)

Metacognitive Knowledge

This refers to knowledge of the task, strategies, and ourselves.

We approach any learning task with some knowledge of:

- **Knowledge of Task**—the type of activity
- **Knowledge of Strategies**—what strategies might be useful
- **Knowledge of Self**—our own abilities and emotions

Metacognitive Regulation

This refers to how we apply this knowledge to a learning task.

It can be broken down into 3 stages:

- **Planning**—how we are going to tackle a task
- **Monitoring**—our success and adapting when necessary
- **Evaluation**—of the learning process

BACKGROUND

Academic achievement:

- Major interest in education because closely related to academic achievement (Zohar & Barzilai, 2013; Donker et al., 2014; Ohtani & Hisasaka, 2018)
- But large majority of the studies conducted with primary from 8 years old, secondary and college students
- And only emergent works with young children (Whitebread et al., 2009; Maric & Sakac, 2018; Jacob et al., 2020)

Socioeconomic status:

- Rare studies on the relations between socioeconomic status and metacognition regardless of participants' age (Muijs & Bokhove, 2020)
- But data on primary and secondary school students suggesting that metacognition could constitute a lever to reduce educational inequalities (de Boer et al., 2018)
- And no study with young children while educational inequalities are witnessed from the earliest age

PRELIMINARY WORK

Sample

N = 90 kindergarteners (51% girls, 5-6 years old)
Recruitment in schools in Paris
Families from diverse socioeconomic backgrounds

Measures

SES — Parental educational level
Parental occupational status

MCog — Metacognitive knowledge
Metacognitive regulation skills

Lang — Vocabulary / Phonological awareness / Grammar

Math — Counting / Numeration / Arithmetical operations

Results

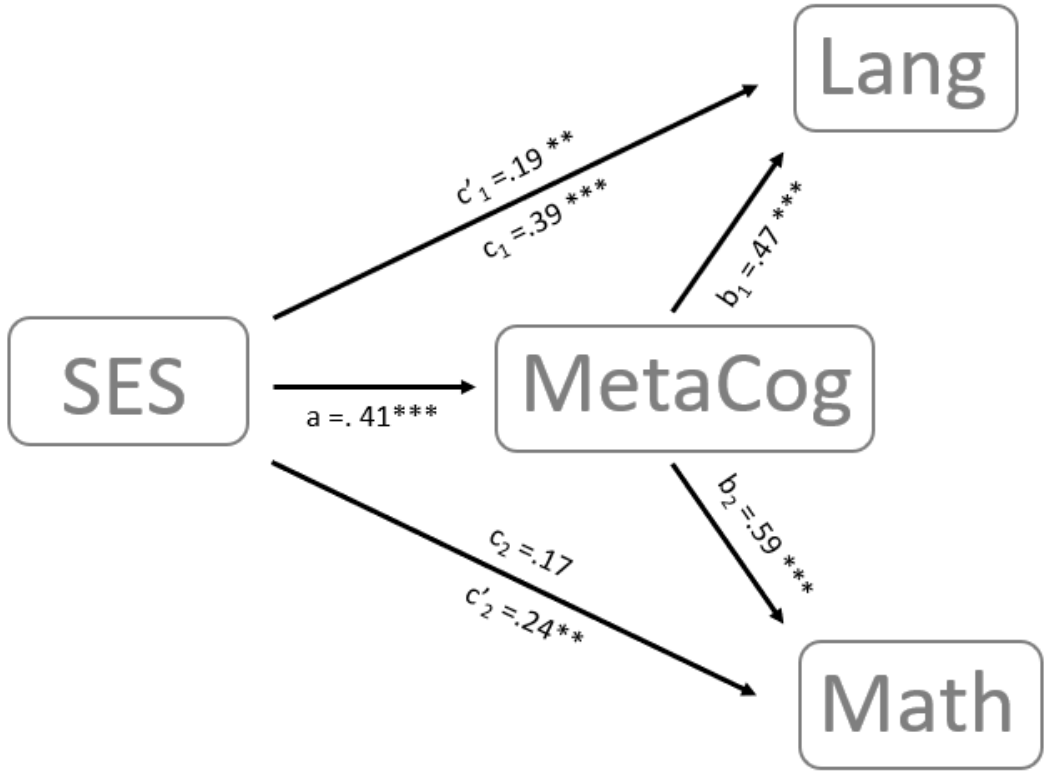


Figure 1. Double mediation analysis of the association between SES, and language and math abilities with metacognition as mediator. Paths a, b_1, b_2, c_1 and c_2 report the beta weight for each corresponding direct effect. Paths c'_1 and c'_2 report the beta weight for each corresponding indirect effect. ** $p < .01$ and *** $p < .001$.

→ **Significant mediation**

Maximino-Pinheiro et al. (submitted)

PROJECT AIMS

PROJECT METACHILD

AIM 1

Explore the relations between metacognition, academic achievement and educational inequalities in young children between 5 and 7 years old

AIM 2

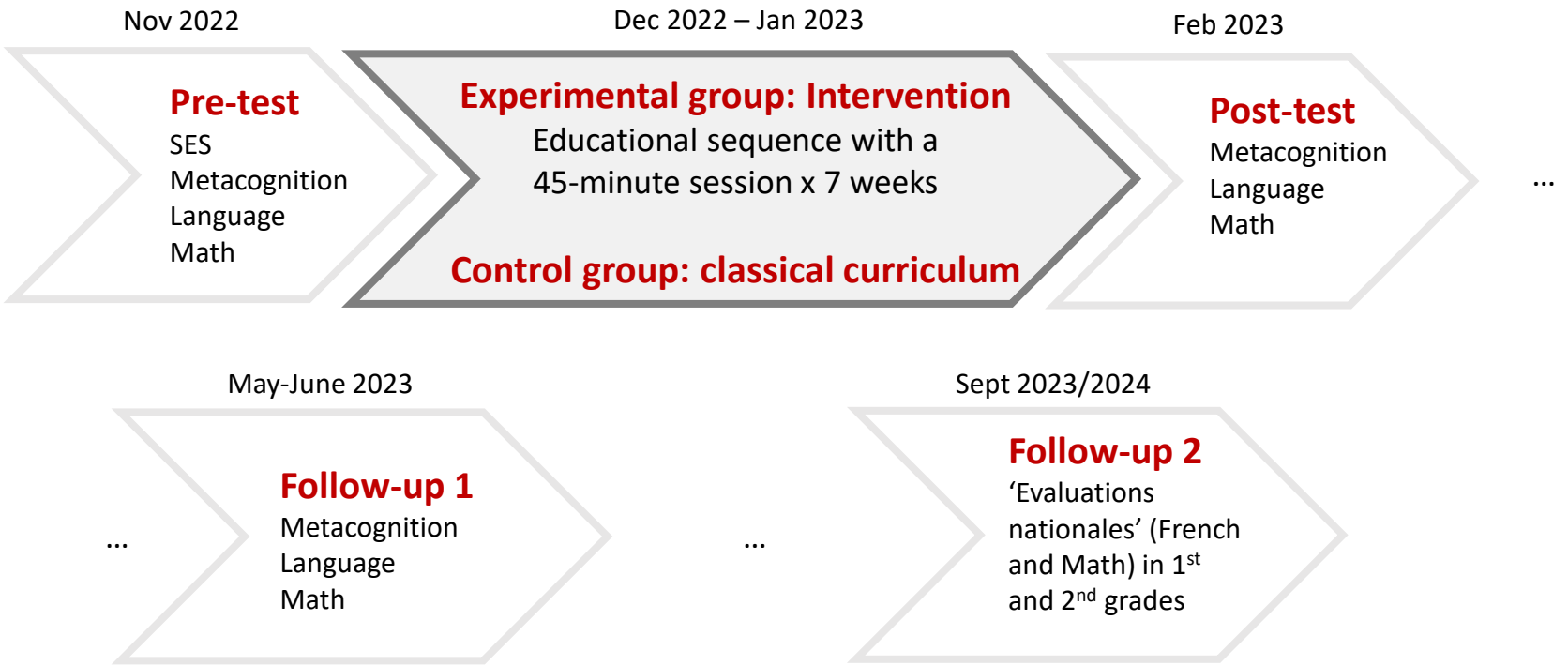
Evaluate whether a direct classroom intervention aiming at promoting metacognition in kindergarten can reduce educational inequalities

STUDY DESIGN

Sample

N = 350 kindergarteners (54% girls, 5-6 years old)
Experimental group : *n* = 175 / *n* = Control group = 175
Recruitment in schools in the region of Paris
Families from diverse socio-economic backgrounds

Protocol



INTERVENTION

Séance 1 Séance introductive et Connaissances métacognitives	Présentation de chacun et du programme Apprendre à…connaître son cerveau : que connaissez-vous du cerveau ? *Atelier : dessiner un cerveau tel que vous l'imaginez*
Séance 2 Connaissances métacognitives	Apprendre à…connaître son cerveau : où se situe le cerveau, à quoi ressemble-t-il et à quoi sert-il ? *Atelier : apprendre à écrire le mot CERVEAU*
Séance 3 Connaissances métacognitives	Apprendre à…connaître son cerveau : à quoi servent les neurones, à quoi ressemblent-il et qu'est-ce que la plasticité cérébrale ? *Atelier : créer le réseau de neurones de la classe à l'aide de neurones fabriqués en fil chenille*
Séance 4 Compétences métacognitives	Apprendre à…planifier une activité *Atelier : coller les images qui représentent l'objectif, l'activation des connaissances préalables, la définition des étapes et la sélection des stratégies les plus adaptées*
Séance 5 Compétences métacognitives	Apprendre à…superviser une activité et à s'auto-évaluer *Atelier : coller les images qui représentent la supervision, la correction des erreurs mises en évidence, l'évaluation rétrospective et prospective*
Séance 6 Compétences métacognitives	Apprendre à…mobiliser les stratégies métacognitives ensemble dans une activité *Atelier : relier les questions métacognitives à la bonne activité*
Séance 7 Séance conclusive	Récapitulatif et conclusion du programme *Atelier :* dessiner ce que vous avez préféré de toutes les séances

Metacognitive knowledge

Metacognitive awareness

Metacognitive regulation skills

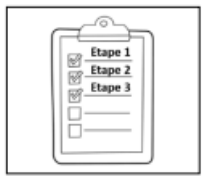
Les QUESTIONS à se poser AVANT

➔ **Objectif**

Quel est l'objectif de l'activité ?
Qu'est-ce qu'on me demande de faire ?
Quelle est la compétence que je travaille ?
Pourquoi c'est important de la travailler ?

➔ **Connaissances préalables**

Est-ce que je connais tous les éléments de l'activité ?
Est-ce que j'ai bien activé toutes les connaissances dont j'ai besoin pour réaliser cette activité ?
Est-ce que j'ai demandé de l'aide si je n'avais pas toutes les connaissances ?

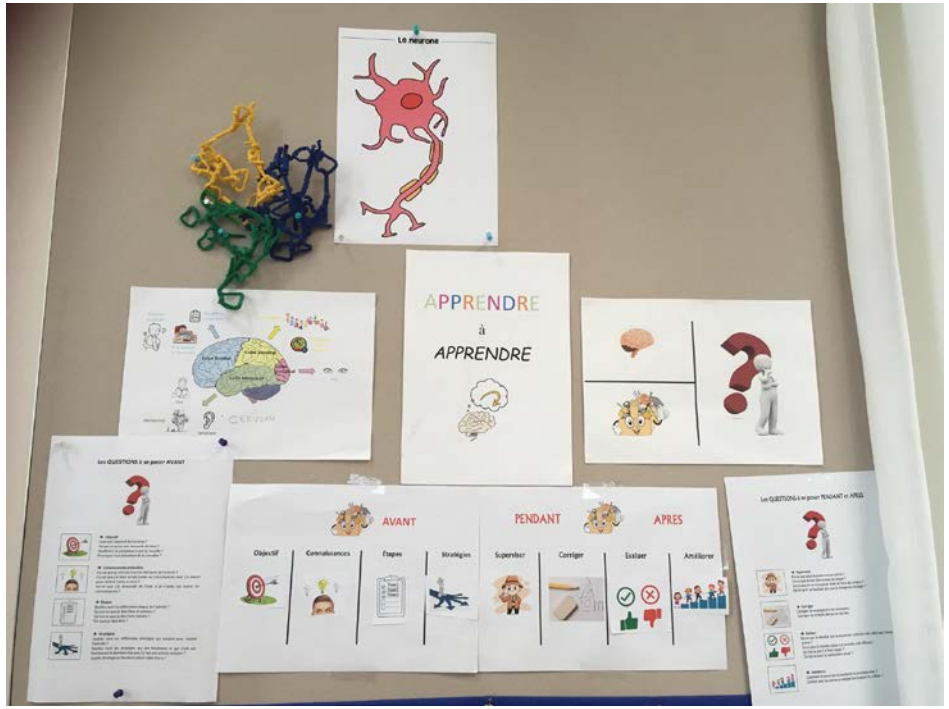


➔ **Étapes**

Quelles sont les différentes étapes de l'activité ?
Qu'est-ce que je dois faire en premier ?
Qu'est-ce que je dois faire ensuite ?
Par quoi je dois finir ?

➔ **Stratégies**

Quelles sont les différentes stratégies qui existent pour réaliser l'activité ?
Quelles sont les stratégies qui ont fonctionné et qui n'ont pas fonctionné la dernière fois que j'ai fait une activité similaire ?
Quelle stratégie je décide d'utiliser cette fois-ci ?



IMPLICATIONS

- Inform on the **potential of metacognition as a lever to reduce educational inequalities** from an early age

- If the results are conclusive, we can expect this **intervention to be disseminated on a large scale** to the actors of the educational community
  → Turn-key intervention, easily accessible and cost-effective

- **Pre-service and in-service teacher training** (change of professional posture, development of pedagogical practices improving students' metacognition)

Thank you for listening!

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