# Foreign language attainment of children/ adolescents with poor literacy skills: a meta-analysis 

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## Do you think that children and adolescents should learn a foreign language at school?



## Do you think that children and adolescents with poor literacy skills should learn a foreign language at school?



## Systematic literature review and meta-analysis



## Rigorous methodology

## Research question and elgibility criteria



Search strategy


Selection and data extraction

Risk of bias assessment


## Data analysis



Interpretation and report


Cochrane

# Foreign language attainment in children and adolescents with poor literacy skills: a systematic review protocol Alexa von Hagen, Saskia Kohnen \& Nicole Stadie 

PROSPERO<br>International prospective register of systematic reviews

Foreign language attainment of children and adolescents with poor literacy skills: a systematic review protocol

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Citation
Alexa von Hagen, Saskia Kohnen, Nicole Stadie. Foreign language attainment of children and adolescents with poor literacy skills: a systematic review protocol. PROSPERO 2017 CRD42017069980 Available from:
http://www.crd.york.ac.uk/PROSPERO/display_record.php?ID=CRD42017069980

## Review question

How successful are children and adolescents with poor literacy skills in learning a foreign language, as compared to children and adolescents with average literacy skills?

Do participant characteristics (age of onset, age at assessment, linguistic background, profile of native language difficulties, language pairing between native and foreign language), foreign language outcome measures (type of foreign language subskills) and instruction type (frequency and duration) moderate the success of children and adolescents with poor literacy skills experience in learning a foreign language, as compared to their peers with average literacy skills?

## Research question

How successful are children and adolescents with poor literacy skills in learning a foreign language, as compared to children and adolescents with average literacy skills?

## $P_{\text {opulation }}$ Intervention <br> Comparison



## Research question

## Do .....

> participant characteristics


- age of onset
- age at assessment
- linguistic background
- profile of native language difficulties
- language pairing between native and foreign language
.... moderate the success of children and adolescents with poor literacy skills in learning a foreign language, as compared to their peers with average literacy skills?


## Search strategy



AND

| second language | OR | foreign language | OR | bilingualism | OR | additional language |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |

## Search strategy

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## Selection and data extraction



## Risk of bias assessment

## ROBINS I scale (Sterne et al., 2016)

Confounding
Selection of participants into the study

Clasification of interventions

Deviation from intended interventions

Missing data
Measurement of outcomes

Selection of the reported results


## Risk of bias assessment



No information ${ }^{-}$Low risk ${ }^{-}$Moderate risk ■ Serious risk $^{\square}$ Critical risk

## Selection and data extraction

Native language
Foreign language


Dutch


Italian


Cantonese


Norwegian


Polish


Mandarin


## Selection and data extraction

- Discrimination of speech sounds
- Production of speech sounds
- Spoken word comprehension
- Spoken word production
- Sentence comprehension
- Sentence production
- Phonological awareness
- Letter knowledge
- Word reading
- Nonword reading
- Orthographic knowledge
- Reading comprehension
- Spelling
- Translation


## Data analysis

Foreign language word reading

| Study | Experimental group (n) | Control group (n) |  | $\begin{gathered} \text { SMD } \\ (95 \% \mathrm{Cl}) \end{gathered}$ | Weight (\%) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Bekebrede et al. (2009) | 37 | 35 | $\square$ | -1.87 (-2.43, -1.31) | 8.2 |
| Bonifacci et al. (2017) | 19 | 76 | - | -1.38 (-1.85, -0.91) | 8.2 |
| Chung et al. (2010) | 28 | 28 | - | -3.99 (-4.91, -3.06) | 7.6 |
| Ding et al. (2013) | 18 | 84 | $\square$ | $-0.40(-0.86,0.07)$ | 7.8 |
| Helland et al. (2005) | 20 | 20 | - | -2.35 (-3.17, -1.53) | 7.1 |
| Helland et al. (2016) | 13 | 28 | $\square$ | -1.52 (-2.26, -0.78) | 6.9 |
| Ho et al. (2005) | 25 | 25 | $\square$ | -1.27 -1.88, -0.66 | 6.6 |
| Lockiewicz et al. (2016) | 48 | 50 |  | -0.67 -1.02, -0.31) | 8.8 |
| Morfidi et al. (2007) | 26 | 26 | - | -1.30 -1.83, -0.78) | 8.1 |
| Palladino et al. (2013) | 23 | 23 | - | -3.61 -4.39, -2.83 | 8.1 |
| van der Leij et al. (2006) | 16 | 25 | $\square$ | -1.62 (-2.21, -1.02) | 7.8 |
| van Viersen et al. (2017) | 31 | 20 | - | $-1.65(-2.20,-1.11)$ | 8.1 |
| Zhou et al. (2014) | 15 | 15 | - | -0.24 (-0.96, 0.48) | 6.6 |
| Total | 319 | 455 |  | -1.6 (-2.1, -1.1) | 100 |

Heterogeneity SMD: $Q=114.33, d f=12, p<.001 ; r^{2}=0.72 ; I^{2}=89.50 \%$

## Interpretation of results

- Spoken word comprehension
- Spoken word production
- Phonological awareness
- Letter knowledge
- Word reading
- Nonword reading
- Orthographic knowledge
- Reading comprehension
- Spelling
- Translation


## Significant between study heterogeneity

## Moderator analyses

Do .....

> participant characteristics


- age of onset
- age at assessment
- linguistic background
- profile of native language difficulties
- language pairing between native and foreign language
.... moderate the success of children and adolescents with poor literacy skills in learning a foreign language, as compared to their peers with average literacy skills?


## Interpretation of results

- Spoken word comprehension
- Spoken word production
- Phonological awareness
- Letter knowledge
- Word reading
- Nonword reading
- Orthoraphic knowledge
- Reading comprehension
- Spelling
- Translation

> Significant between study heterogeneity

## Interpretation of results

| Outcome variable | SMD | $n$ of studies |
| :--- | :---: | :---: |
| Spoken word comprehension | $-0.47^{\text {ns }}$ | 5 |
| Spoken word production | $-1.10^{*}$ | 4 |
| Phonological awareness | $-1.10^{*}$ | 4 |
| Letter knowledge | $-1.23^{*}$ | 2 |
| Reading comprehension | $-1.00^{*}$ | 2 |

Problems with meta-analyses solely based on SMD

## Heterogeneity of children and adolescentes with poor literacy skills



## Interpretation of results

Coefficient of variation $(C V R)=$| natural logarithm of the ratio between the |
| :---: |
| coefficients of variation of both participant |
| groups |

(Nakagawa et al., 2015)

| Outcome variable | SMD | CVR |
| :--- | :---: | :---: |
| Spoken word comprehension | $-0.47^{\text {ns }}$ | Significant between study <br> heterogeneity |
| Spoken word production | $-1.10^{*}$ | Significant between study <br> heterogeneity |
| Phonological awareness | $-1.10^{*}$ | $-0.38^{*}$ | Letter knowledge $\quad-1.23^{*} \quad ~$| Significant between study |
| :---: |
| heterogeneity |

## Summary of results

- Foreign language attainment of children/adolescentes with poor literacy skills is highly variable
- Insufficient evidence to undertand the sources of this variability
- Available evidence is limited to
> native speakers of Dutch, Norwegian, Italian, Polish, Mandarin and Cantonese learning English as a foreign language
> foreign language spoken word comprehension and production, phonological awareness, letter knowledge and reading comprehension
$>2$ to 5 study reports for each foreign language outcome measure


## Do you think that children and adolescents with poor literacy skills should learn a foreign language at school?




Dank Je
Blaguidian mpiekuie

## Juspaxar 1 Arigato

Cracias ${ }^{\text {a }}$ Mochchakkeram

 Dékuii Nirringrazziak Suksama
 Misaotra谢 © Danke

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 흘 ขอขอบคุณคุณ
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