Wie wirksam ist eine lautorientierte Leseförderung bei Schüler*innen mit intellektueller Beeinträchtigung?

Eine geplante Metaanalyse

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Die geplante Studie: Metaanalyse

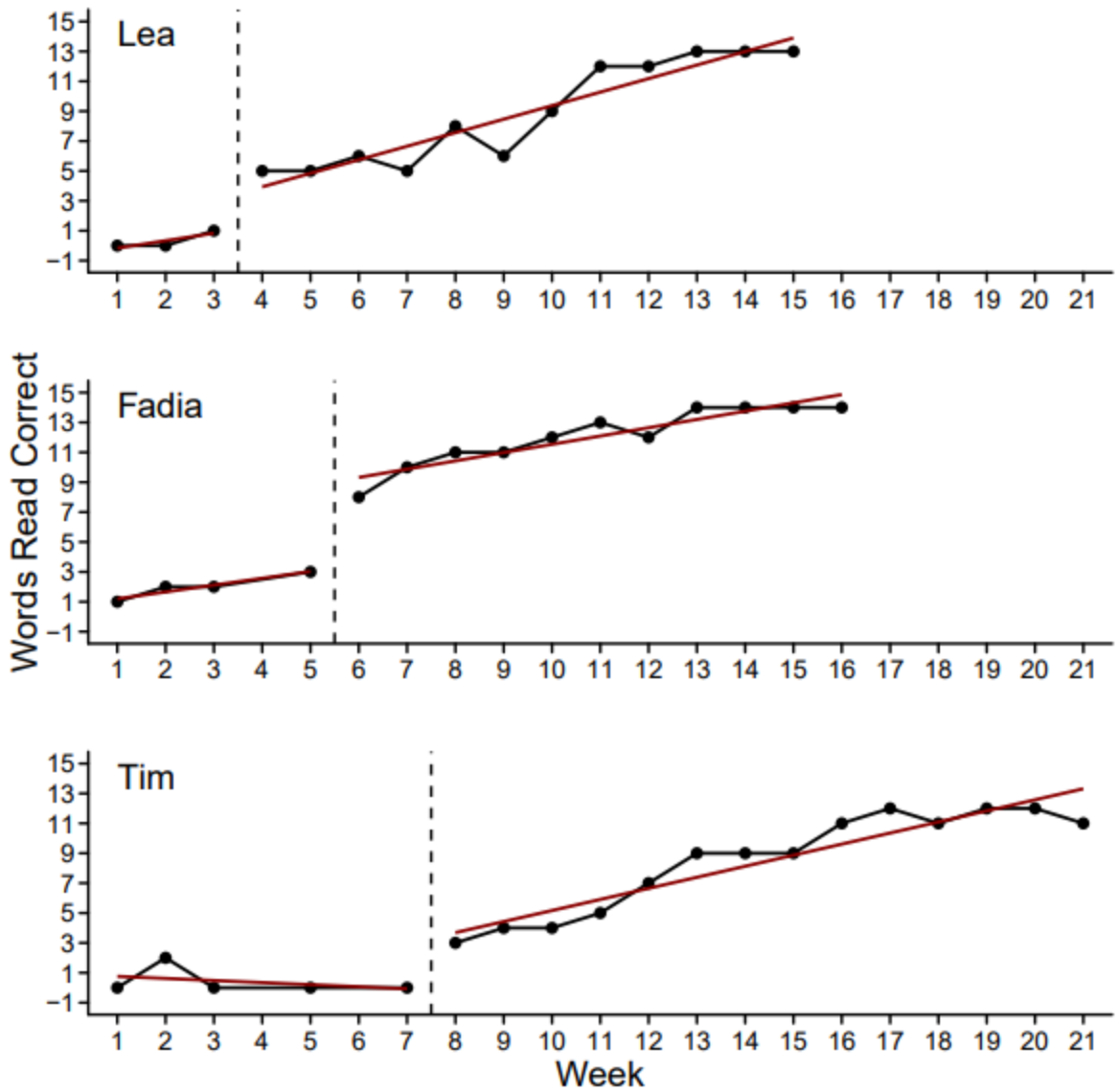
Intervention	lautorientierte Leseförderung (Scarborough & Brady, 2002)
Outcome	Wortlesefertigkeit
Zielgruppe	Menschen mit intellektueller Beeinträchtigung
Studiendesign	experimentelle Einzelfallstudie
Baseline	kein Leseunterricht, Ganzwortlesen, gewöhnlicher Unterricht

Ziele

Was ist der **mittlere Level-** und **Slope-Effekt** der lautorientierten Leseförderung?

In welchem Ausmaß **variieren die Effekte** zwischen Fällen und Studien?

In welchem Ausmaß **moderieren** Merkmale der Studie, der Intervention und der Schüler*innen den Effekt?



Linder et al., 2023

Studie 2

Studie 3

...

1. Effektstärken berechnen

Piecewise Regression Analysis mit standardisierten Werten (Center et al., 1985; Huitema & McKean, 2000)

$$Y_{ijk} = b_{0jk} + b_{1jk}Time_{ijk} + b_{2jk}Phase_{ijk} + b_{3jk}Phase_{ijk} \times Time'_{ijk} + e_{ijk}$$

Level-Effekt Slope-Effekt

Small-Sample-Bias Correction (Hedges, 1981; Jamshidi et al., 2021)

$$b'^{C}_{jk} = b'_{jk}\left(1 - \frac{3}{4(I-p-1)-1}\right) \qquad V'^{C}_{jk} = V'_{jk}\left(1 - \frac{3}{4(I-p-1)-1}\right)^2$$

2. Effektstärken zusammenfassen

(Konstantopoulos, 2011; Van Den Noortgate & Onghena, 2003)

Level 1	$b_{jk}^{\prime C} = \beta_{jk} + e_{jk}$	$e_{jk} \sim N(0, V)$
Level 2	$\beta_{jk} = \theta_{0k} + \mu_{jk}$	$\mu_{jk} \sim N(0, \omega^2)$
Level 3	$\theta_{0k} = \gamma_{00} + \nu_{0k}$	$\nu_{0k} \sim N(0, \tau^2)$

Korrektur SE: Cluster Robust Variance Estimation (Pustejovsky & Tipton, 2018)

Konfidenzintervall: *t*-Verteilung und Satterthwaite *df* (Ferron et al., 2009)

Parameterschätzung: REML (Langan et al., 2019)

Software: R, metafor (Viechtbauer, 2010), clubSandwich (Pustejovsky, 2023)

3. Heterogenität quantifizieren

$\boldsymbol{Q}$ (Cochran, 1954)

Nullhypothese: Die Varianz der wahren Effekte zwischen den Studien und innerhalb der Studien ist null.

$\boldsymbol{I^2}$ (Cheung, 2014)

$$I^2_{Level\ 2} = \frac{\Omega^2}{\Omega^2+T^2+V} \qquad I^2_{Level\ 3} = \frac{T^2}{\Omega^2+T^2+V}$$

$\boldsymbol{\Omega}$ SD der wahren Effekte innerhalb der Studien

$\boldsymbol{T}$ SD der wahren Effekte zwischen Studien (Borenstein, 2019)

4. Heterogenität erklären

Level 1 $$b_{jk}^{'C} = \beta_{jk} + e_{jk}$$

Level 2 $$\beta_{jk} = \theta_{0k} + \theta_1 IQ_{jk} + \theta_2 AV_{jk} + \mu_{jk}$$

Level 3 $$\theta_{0k} = \gamma_{00} + \gamma_1 Qualität_k + \nu_{0k}$$

Moderatorvariablen

*Schüler*innen*: IQ, phonologische Fertigkeiten, alphabetisches Wissen, Sprachfähigkeiten, Komorbiditäten

Intervention: Typ, Prompt-Fading Verfahren, Feedback, zusätzliche Komponenten

Implementierung: Setting, Trainer*in, Intensität, Transparenz der Orthographie

Studie: Design, Qualität, Messinstrument, AV Typ, Baseline

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„finanziert und gefördert aus Mitteln des Bundesministeriums für Bildung, Wissenschaft und Forschung und der Innovationsstiftung für Bildung in Österreich“

Wie wirksam ist Phonics Instruction?

Tab. 1: *Metaanalysen von Gruppenstudien*

Metaanalyse	Jahr	Outcome	Studien	*g*	95% CI
Sermier Dessemontet et al.	2019	PW & W	6	0.41	[0.13, 0.69]
Reichow et al.	2019	W	5	0.54	[0.05, 1.03]
		PW	5	0.40	[0.12, 0.67]
Bakken et al.	2021	Transfer	5	0.49	[0.20, 0.78]
		Trained	3	0.95	[0.51, 1.38]

Anmerkungen. PW = Pseudowort; W = Wort; Transfer = untrainierte Wörter; Trained = trainierte Wörter

Wie wirksam ist Phonics Instruction?

Tab. 2: Weitere Gruppenstudien

Studie	Jahr	Outcome	*g*	95% CI	Gewicht	*N*
Kuhl et al.	2015	PW	0.51	[-0.23, 1.24]	26.37%	33
Euker	2018	PW	0.37	[-0.25, 1.00]	36.45%	63
Sermier Dessemontet et al.	2021	PW & W	0.69	[0.07, 1.31]	37.18%	48
Gesamteffekt			0.52	[0.12, 0.93]	100%	144

Anmerkungen. PW = Pseudowort; W = Wort; random effects model