



Phonological awareness: “necessary” prerequisite for the successful acquisition of literacy?

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- 1)** phonological awareness - overview
- 2)** re-analysis of data collected
to norm a test for phonological
awareness
- 3)** conclusion and perspectives



phonological awareness - overview

- considered to be one of the strongest and reliable predictors of future reading and spelling abilities in grade one and beyond

"A student's level of phonological awareness at the end of kindergarten is one of the strongest predictors of future reading success, in grade one and beyond."

Adams, M. J., B. R. Foorman, I. Lundberg, and T. Beeler. Phonemic Awareness in Young Children: A Classroom Curriculum. Paul Brookes Publishing Co., 1998.

- therefore should be well developed at the beginning of learning to read and spell in school (**Really?**)



phonological awareness - overview

awareness

- that spoken language consists of sounds
- that spoken language can be segmented into words, syllables, and phonemes
- that words can rhyme

ability

- to detect syllables, onsets, rhymes, phonemes
- to manipulate them by segmenting, blending, deleting, substituting



phonological awareness - overview

typical tasks and skills are

- identifying/ producing words that rhyme
- identifying words that start/end with the same phoneme
- identifying the first/ middle/ ending phoneme of a word
- segmenting sentences into words => syllables => phonemes
- blending of phonemes into => syllables => into words
- deleting/ substituting syllables and phonemes from words
- adding, deleting, substituting phonemes in words



phonological awareness - overview

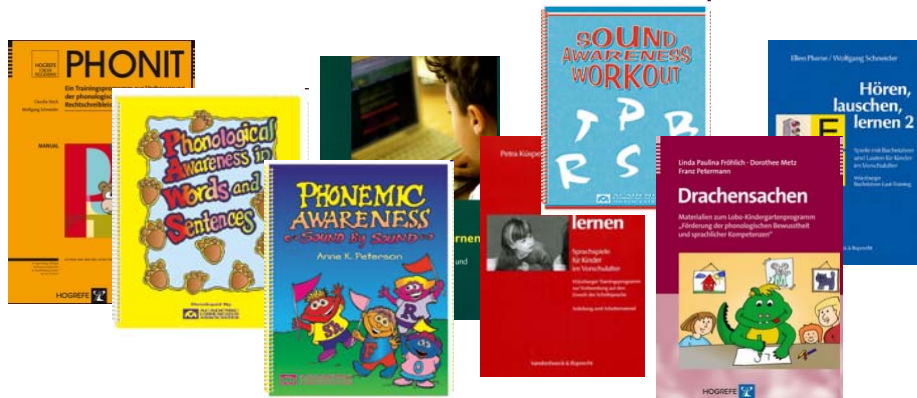
- several standardized tests were designed to measure phonological awareness in kindergarten and primary school





phonological awareness - overview

- several training programmes to support the development of phonological awareness in kindergarten and primary school



phonological awareness - overview

“strong” predictor of future reading and spelling abilities

- ➔ correlation studies showed positive and statistically significant correlations between phonological awareness and reading and spelling abilities
- ➔ (quasi-)experimental training studies showed impact of phonological awareness to reading and spelling abilities

(Einsiedler, Frank, Kirschhock, Martschinke & Treinies 2002;
Walter 2002; Marx, Weber, Schneider 2005; Steinbrink 2006)



phonological awareness - overview

On the other side...

- recently several studies that question the role of phonological awareness as a strong predictor:
- re-analyses of the Bielefelder Screening (Jansen et al. 1999) by Brügelmann (2003; 2005) and Marx & Weber (2006) could not replicate the prognostic validity of the BISC
- several (quasi-)experimental studies showed no significant influence of phonological awareness to reading and spelling abilities of 1st graders and beyond (May & Okwumo 1999; Roos et al., 2007, Rothe 2008; Franzkowiak 2008; Rackwitz 2009)



Phonological awareness:

- necessary prerequisite skill
- strong predictor

of reading and spelling abilities





study: re-analyses

Barth/ Gomm (2008): "Gruppentest zur Früherkennung von Lese-Rechtschreibschwierigkeiten."

- group test for early recognition of reading and spelling problems
- measuring phonological awareness
 - of children in Kindergarten
 - of 1st graders at the beginning of school



test - overview

phonA in a wider sense

- identifying rhymes
Tisch/ Fisch/ Hut
- segmenting into syllables
- length of word

phonA in a narrower sense

- phoneme matching
"Which words begin with the same sound?"
- synthesis
("Sch-uh")
- identifying of last phoneme



test statistics - overview

N = 474 children of 1st grade

- to norm the test
- for validation

6 tasks

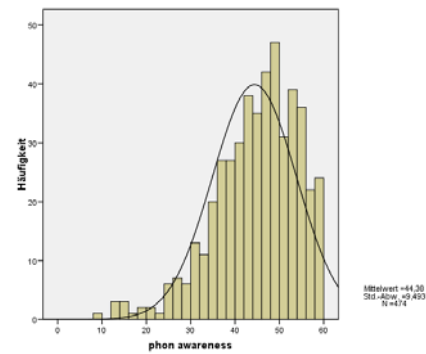
- ➔ 10 points each
- ➔ maximum score 60 points

whole sample

M = 44.38; SD = 9.49

incl. N = 46 (9.70%)

children with other mother
tongue than German



predictive validity

at the end of 1st grade

- ➔ spelling test DBL1 (Dummer-Smoch 1993)

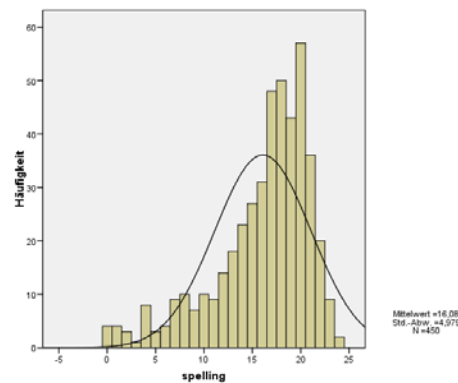
N = 450 children

- ➔ N = 41 (9.10%)
children with other
mother tongue

spelling of 24 words

words spelled correctly

M = 16.08; SD = 4.98





predictive validity

phon awareness

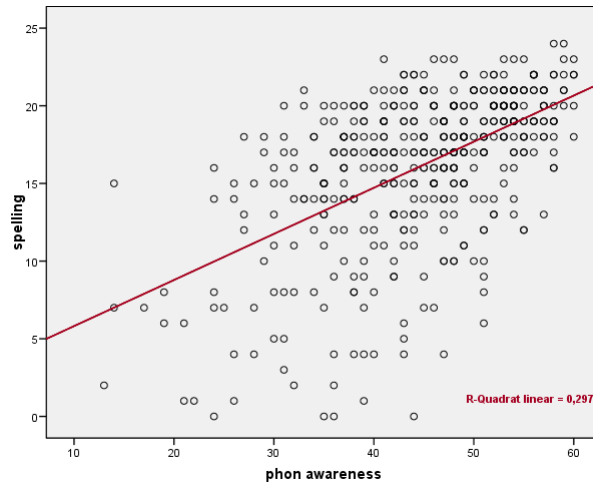
* spelling test

$r = .545$; $p < .000$

explained variance

$r^2 = .297$

→ **29.70%**



predictive validity

phon awareness

* spelling test

$r = .545$; $p < .000$

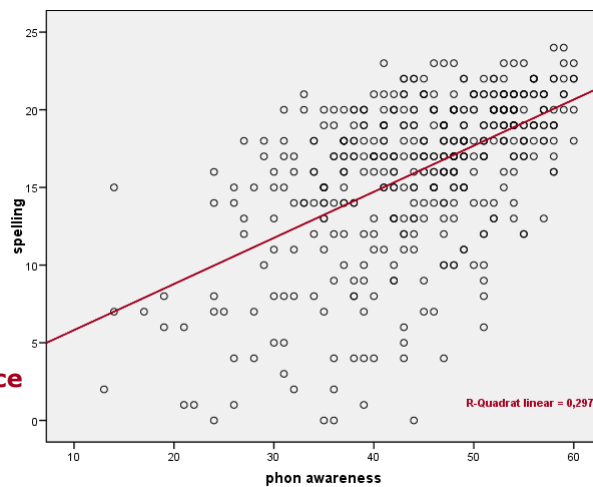
explained variance

$r^2 = .297$

→ **29.70%**

unexplained variance

70.30%





predictive validity

$r = .545^{**}$

→ explained variance 29.70%

- similar to results in other correlation studies
- considered to be a strong correlation and a large effect size
- qualitative decision
- in educational psychology there are hardly any higher correlations to find in field studies
(c.p. Cohen, J.: Statistical Power Analysis for the Behavioral Sciences. (2nd ed.) 1988.)



predictive validity

How precisely can children with later spelling difficulties be identified by the test?

Defining the cut-off point for children at risk

Mean - 1 x SD = cut-off point

M = Mean

SD = Standard Deviation

M = ?

SD = ?

→ qualitative decision



predictive validity

cut-off point for phonological awareness test

- all children in whole sample (N = 474)
=> cut-off point \leq 34 pts
- children with German mother tongue in whole sample (N = 428)
=> **cut-off point \leq 36 pts => Barth/ Gomm**
- children with German mother tongue (N = 409)
who took part in the spelling test
=> cut-off point \leq 36 pts
- children who took part in the spelling test (N = 450)
=> **cut-off point \leq 35 pts**

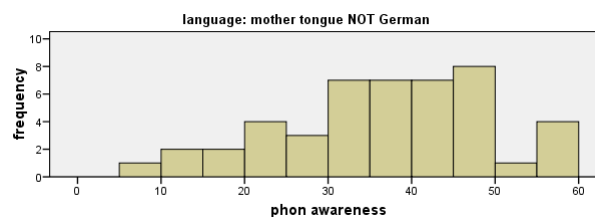


predictive validity

M = 45.25
SD = 8.74
N = 428

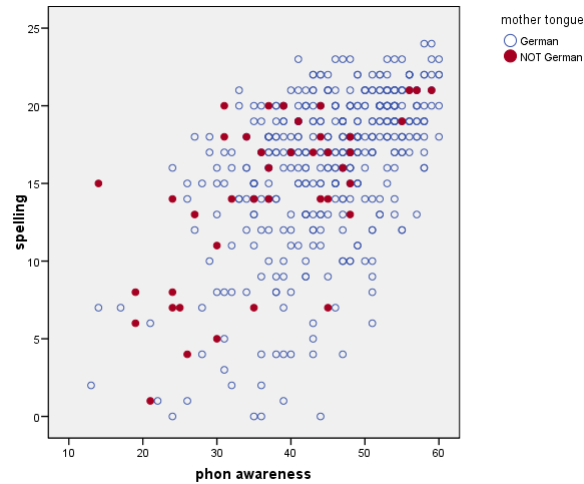


M = 36.30
SD = 12.17
N = 46





predictive validity



predictive validity

How precisely can children with later spelling difficulties be identified by the test?

cut-off points

children at risk

result in phon test ≤ 35 pts
(at the beginning of 1st grade)

children with spelling difficulties

results in spelling test ≤ 8 words
(at the end of 1st grade)

all children who took part
in the spelling test (N = 450)

M 44.59; SD = 9.14

M - SD = 35.45



predictive validity

		spelling		
		difficulties	no difficulties	
p h o n	risk	26 (56.5%)	45 (11.1%)	
	no risk	20 (43.5%)	359 (88.9%)	
		46 (100%)	404 (100%)	total 450

true positive rate: 56.50% children with spelling difficulties

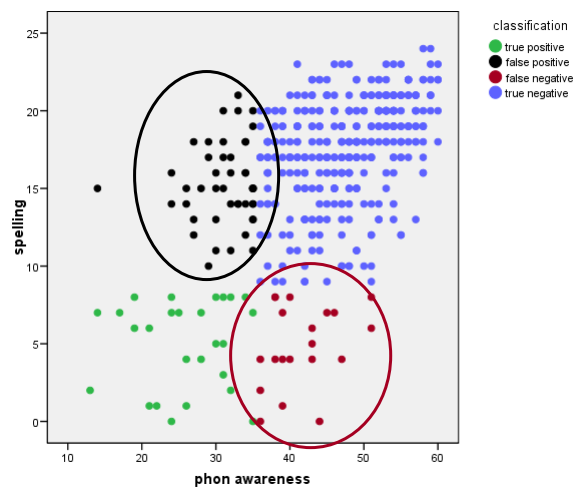
miss rate: 43.50%

true negative rate: 88,9% children without spelling difficulties

false positive rate: 11.10%



predictive validity





predictive validity

		spelling		
		Difficulties	no difficulties	
p h o n	risk	26 (36.6%)	45 (63.4%)	71 (100%)
	no risk	20 (5.3%)	359 (94.7%)	379 (100%)
				total 450

positive predictive value: 36.6% children with spelling difficulties

false positive predictive value: 63.4%

negative predictive value: 94.7% no spelling difficulties

false negative predicitive value: 5.3%



predictive validity

		spelling		
		difficulties	no difficulties	
p h o n	risk	26 (36.6%)	45 (63.4%)	71 (100%)
	no risk	20 (5.3%)	359 (94.7%)	379 (100%)
				total 450

RATZ Index: 48.4% => good/ acceptable but unspecific

Relativer Anstieg der Trefferquote gegenüber der Zufallstrefferquote

increase of the hit-rate compared to the hit rate by chance (in percent)

0 – 33% unacceptable; 34 – 66% good but unspecific; 67 – 100% very good classification

	cut-off points in phonA test to define children at risk			
	whole sample (N=474) ≤ 34	mother tongue German, whole sample (N=428) ≤ 36	all children who took part in the spelling test (N=450) ≤ 35	mother tongue German, who took part in the spelling test (N=409) ≤ 36
true positive rate (sensitivity)	52,2%	63%	56,5%	55,5%
miss rate	47,8%	37,0%	43,5%	44,4%
true negative rate (specificity)	91,6%	87,1%	88,9%	88,7%
false negative rate	8,4%	12,9%	11,1%	11,3%
positive predictive value	41,4%	35,8%	36,6%	32,3%
false positive predictive value	58,6%	64,2%	63,4%	67,7%
negative predictive value	94,4%	95,4%	94,7%	95,4%
false negative predictive value	5,6%	4,6%	5,3%	4,6%
RATZ-Index	45,1%	54,9%	48,4%	47,4%



predictive validity - conclusion

- correlation phon awareness * spelling explains 30% variance
→ **70% unexplained variance**
- 57% of the children with later deficits were identified
→ **43% of the children with later deficits were not identified**
- 37% of the children "at risk" did show a spelling deficit
→ **63% of the children "at risk" did not show a spelling deficit**
- **RATZ index = 48%**
→ **acceptable classification but unspecific** (by definition)



predictive validity - conclusion

- The results of this re-analyses are slightly better than the results of the re-analyses of the Bielefelder Screening (Brügelmann 2003, 2005; Marx/ Weber 2006).
- The results of this analyses contribute to recent findings that phonological awareness is overestimated as a strong predictor of later (reading and) spelling competencies and therefore as a prerequisite skill.



Thank you very much for your attention!

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