To what extent does L2 oral reading performance in adults predict reading comprehension?

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Organization

- Background

- Research Questions

- Analyses

- Results

- Discussion & Summary

Background

Assessing reading comprehension in adult language learners

- Tests of oral reading fluency
  - Benefits: quick, rich data
- Fluent reading = "The ability to read a text quickly, accurately, and with proper expression"
  - Accuracy (% of words read correctly)
  - Rate (words read correctly, usually in a minute)
  - Expressiveness (appropriate pausing, stress, rhythm, intonation)

Previous Research

Developing L1 readers…

Features of oral reading performances such as accuracy, rate, and expressiveness have been associated with reading comprehension

(e.g., Fuchs, Fuchs, Hosp, & Jenkins, 2001; Fuchs, Fuchs, & Maxwell, 1988; Schwanenflugel et al., 2004; Klauda & Guthrie, 2008; Pinnell et al., 1995; Daane et al., 2005)

Adult L2 readers…

Techniques for improving reading comprehension sometimes include teaching reading fluency strategies and/or practice, but are features of such reading performances themselves associated with comprehension in a consistent, meaningful way?

Background

- Reasonable that measuring features of oral reading performances might permit inferences to be made about reading comprehension.

- Could represent a non-traditional, time-saving new tool in the toolbox for assessing reading.

Research Questions

RQ1: In adult learners reading in their L2, is there a relationship between accuracy, rate, and expressiveness in oral reading performance and their reading comprehension scores?

RQ2: To what extent do oral reading performance measures predict reading comprehension scores?

RQ3: To what extent does this relationship hold when oral reading performances are elicited using only short passage readings?

Data

Participants:

N = 5105 learners of Dutch as a second language

Sample drawn from candidates taking a high stakes literacy and reading comprehension test (Dutch Reading Test) over a 9 month period

Continents	%	Top 3 Countries
Africa	30%	53% Morocco, 12% Ghana, 11% Egypt
Australia	0%	50%Australia, 50% New Zealand
Asia	45%	15% Thailand, 14% Turkey, 10% Indonesia
Europe	15%	20% Russia, 13% Ukraine, 10% Serbia&Montenegro
North-America	3%	38% Mexico,16% Dominican Republic, 10% Cuba
South-America	7%	44% Brazil, 17% Suriname, 13% Colombia
Total	100%	

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Dutch Reading Test

Procedure:

- Receive test paper

- Call testing system and respond orally to all items into the phone

Section	Task	Number of Items In section	Mean duration of response per item (secs)	Total duration of responses in section (secs)
A	Word rows	4	6	24
B	Sentences	8	4	32
C	Paragraphs	3	25	75
D	Fill in the Gaps	28	8	224
E	Passage Comprehension	3 Passages, 4 questions each	2	24
			Total	379 ≈ 6.5 mins

Dutch Reading Test

- Word Rows

Voorbeeld
Woordrij A

en
de
ook
bal
wil
zee
ham
boom

Dutch Reading Test

- Sentences

Voorbeeld	
Zin A	
A	Mijn zoon is een lieve jongen.

Dutch Reading Test

- Paragraphs

Voorbeeld

Tekst A

Tamar gaat naar de tandarts.

Zij heeft pijn aan haar kies.

Tamar is bang voor de tandarts.

De tandarts kijkt in haar mond.

Tamar heeft gelukkig alleen maar een gaatje.

Ze is blij als de tandarts klaar is.

Ze heeft nu geen pijn meer.

Dutch Reading Test

- Fill in the Gaps

	Voorbeeld Zin A	
A	Het is mooi weer. De zon ...	loopt regent schijnt

Dutch Reading Test

- Passage Comprehension

Voorbeeld

Tekst A

Mevrouw Jansen wacht samen met mevrouw Bol op de bus naar de stad. Er is vandaag markt in de stad. Elke week gaan mevrouw Jansen en mevrouw Bol samen naar de markt. Wat gaan ze vandaag kopen? Niets. Ze gaan naar de markt, omdat het leuk is. Dat doen ze elke woensdag.

Vragen

a. Op welke dag gaat mevrouw Jansen naar de stad?
b. Hoe gaat mevrouw Jansen naar de stad?
c. Met wie gaat mevrouw Jansen naar de stad?

Dutch Reading Test

Trait	Interpretation	Scoring
Accuracy	Did the candidate read each word in context well enough to be understood as the target?	Candidate ability estimate (in logits) based on the # word errors
Rate	How quickly did the candidate read correctly?	# number of words read correctly / time to read X 60 aka, words correct per minute
Expressiveness	How expressively did the candidate read, on a 6 point scale?	Candidate ability estimate (in logits) based on models from human scores
Comprehension	Did the candidate produce the correct answer?	Candidate ability estimate (in logits) based on correct/incorrect

All scores put on a 5 to 40 scale

Dutch Reading Test

Section	Task	Accuracy	Rate	Express.	Compreh.
A	Word rows	X			
B	Sentences	X	X	X	
C	Paragraphs	X	X	X	
D	Fill in the Gaps	X	X		X
E	Passage Comprehension				X

Analysis

RQ1: In adult learners reading in their L2, is there a relationship between accuracy, rate, and expressiveness in oral reading performance and their reading comprehension scores?
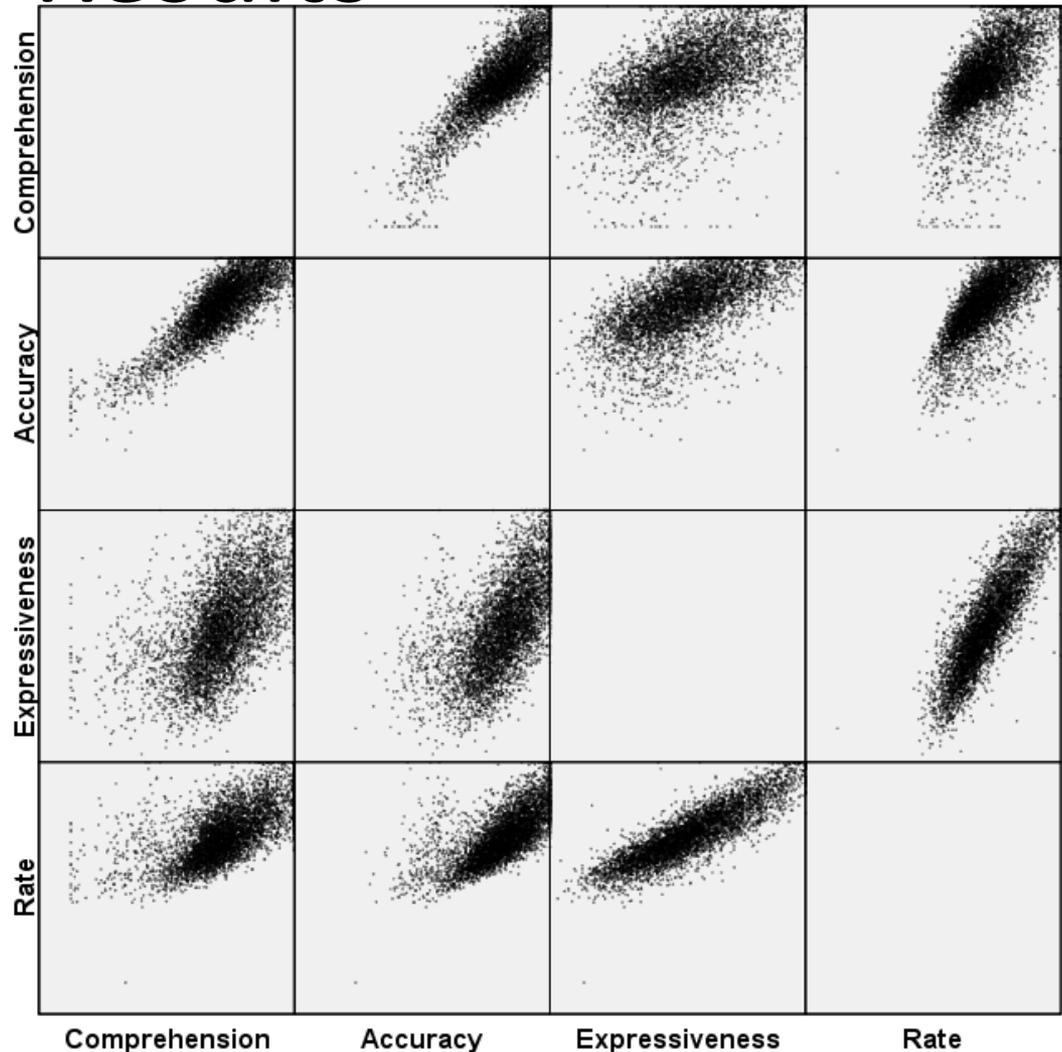
RQ2: To what extent do oral reading performance measures predict reading comprehension scores?

RQ3: To what extent does this relationship hold when oral reading performances are elicited using only short passage readings?

Results

RQ1: "Is there a relationship between the scores?"

	Mean	SD
Comp.	29.26	6.18
Accuracy	32.92	5.08
Rate	28.68	4.42
Express.	28.84	4.77

Results

RQ1: "Is there a relationship between the scores?"

Pearson's Product Moment Correlation Coefficients (r)

	Comprehension	Accuracy	Rate
Accuracy	0.864		
Rate	0.656	0.712	
Expressiveness	0.593	0.642	0.877

**All ps < 0.01

Results

RQ2: "To what extent do accuracy, rate, and expressiveness in oral reading predict reading comprehension scores?"

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.865[a]	.749	.749	3.088

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-6.150	.307		-20.032	.000
	Accuracy	.977	.012	.806	79.979	.000
	Expressiveness	.028	.019	.021	1.466	.143
	Rate	.086	.022	.061	3.821	.000

$F(3, 5099) = 5062.6$, $p < 0.001$

Accuracy and Rate are significant contributors to the model
Expressiveness is not

Results

RQ3: "To what extent does this relationship hold up if the oral reading performances are drawn from 3 passage readings?"

	Entire test		Passages Only	
	Mean	*SD*	Mean	*SD*
Comprehension	29.26	*6.18*	29.26	*6.18*
Accuracy	32.92	*5.08*	26.09	*7.18*
Rate	28.68	*4.42*	28.95	*4.96*
Expressiveness	28.84	*4.77*	28.68	*5.09*

Results

RQ3: "To what extent does this relationship hold up if the oral reading performances are drawn from 3 passage readings?"

Pearson's Product Moment Correlation Coefficients (r)

	Entire Test			Passages Only		
	Comp.	Acc.	Rate	Comp.	Acc.	Rate
Accuracy	0.864			0.650		
Rate	0.656	0.712		0.651	0.839	
Expressiveness	0.593	0.642	0.877	0.589	0.705	0.862

**All ps < 0.01

Results

RQ3: "To what extent does this relationship hold up if the oral reading performances are drawn from 3 passage readings?"

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.682[a]	.465	.465	4.517

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	8.098	.407		19.875	.000
	Accuracy2	.309	.016	.359	19.081	.000
	Expressiveness2	.159	.025	.131	6.474	.000
	Rate2	.295	.033	.237	8.995	.000

$F(3, 5104) = 1478.5$, $p < 0.001$

Now Accuracy, Rate, and Expressiveness are significant predictors of Comprehension, though less of the variance is explained

Summary

- At the test level:
  - The strongest relationships were between:
    - Accuracy and Comprehension (r = 0.86)
    - Expressiveness and Rate (r = 0.88)
  - Model accounted for ~75% of the variance in Comprehension scores, but Expressiveness was not a significant predictor of Comprehension

- Using only 3 passage readings:
  - The strongest relationships were between:
    - Accuracy and Rate (r = 0.84)
    - Expressiveness and Rate (r = 0.86)
  - Model using all three oral reading features accounted for ~46% of the variance in Comprehension scores

Discussion

- There is a relationship between oral reading performance features and reading comprehension

- The data do not provide sufficient evidence to support a claim that oral reading of passages (and passages alone) can be used to predict reading comprehension in adult learners of Dutch

- Expressiveness did not contribute significantly to either model in predicting Comprehension ($r \approx 0.59$)

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Limitations

- Using passage readings alone may not allow for reliable estimation of reading comprehension in L2 adult learners of Dutch.

  These passages may simply not be appropriate for the analysis
  - Maybe 30 seconds is not long enough for many candidates
  - Maybe not enough data for measures to be reliable predictors -- only 3 "observations" per candidate (Accuracy, Rate, and Expressiveness)

- Task limitations:
  – Answering comprehension questions with a text present ≠ reading aloud
    - Could ask comprehension questions
    - Could change instructions to encourage reader to read differently (to show that they understand)
  – Comprehension questions were NOT linked to the oral reading passages
  – Attributes of the test taker / testing conditions

- Something deeper may be going:
  – Related to L1/L2 language & reading transfer, general literacy (in L1), etc.
  – Different "kinds" of readers may show different patterns.

Conclusion

- Oral reading performance in adult L2 readers of Dutch exhibit (overall) different profile of reading

- Being mindful of candidates' (and teachers') time
  - read-aloud performances *do* provide *some* predictive power in estimating reading comprehension
  - read-aloud measures may be a time-efficient way to estimate reading ability
  - read-aloud performances may help identify reading passages at a good level for comprehension tasks

- More research is warranted

Thank you !

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