

Correlations between inhibitory and attentional abilities and monitoring processes in reading performance among second-grade students

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Background

Beside known linguistic skills (word recognition and oral language)¹, strategies and **monitoring processes** are often leveraged by students to support online reading performance².

- While reading aloud, how often word-reading errors are detected and **self-corrected (SC)** may signify students' ability to monitor their reading efficiency².
- After reading the text, proficiency in **recalling (RC)** and summarizing important ideas may act as a proxy for students' ability to monitor their comprehension².

Monitoring processes while reading have been speculated to draw on linguistic skills, as well as other cognitive abilities, such as response inhibition and attentional control³.

- Students may rely on **response inhibition** to detect conflicting cues and suppress irrelevant information⁴.
- Students may depend on **attentional control** to sustain task engagement and identify important information⁴.

Research Aim: This study evaluated whether monitoring processes in reading were related to inhibitory and attentional abilities, aside from known linguistic skills.

Approach

Second-grade students ($N = 154$) were asked to read aloud two texts – one narrative and one expository. Students' performance on these texts were used to capture monitoring processes:

pSC = probability of self-correcting reading errors

- While reading aloud, errors were counted when what students read deviated from the text (e.g., mispronunciations, additions)
- Self-corrections were scored when students executed unprompted revisions of their reading errors.

pRC = probability of recalling important ideas

- After reading, an idea checklist was used to determine which ideas students recalled from the text.
- Ratings from an independent adult sample were used to classify how important each idea was to understand the text.

Students' linguistic and cognitive abilities were measured:

word recognition in timed v. untimed conditions^{5,6}

oral language with receptive & expressive vocabulary subtests^{7,8}

response inhibition in conflicting & contralateral motor tasks^{9,10}

attention control with rating-scale evaluation^{11,12}

Results

Note. All paths shown met $p < 0.05$.

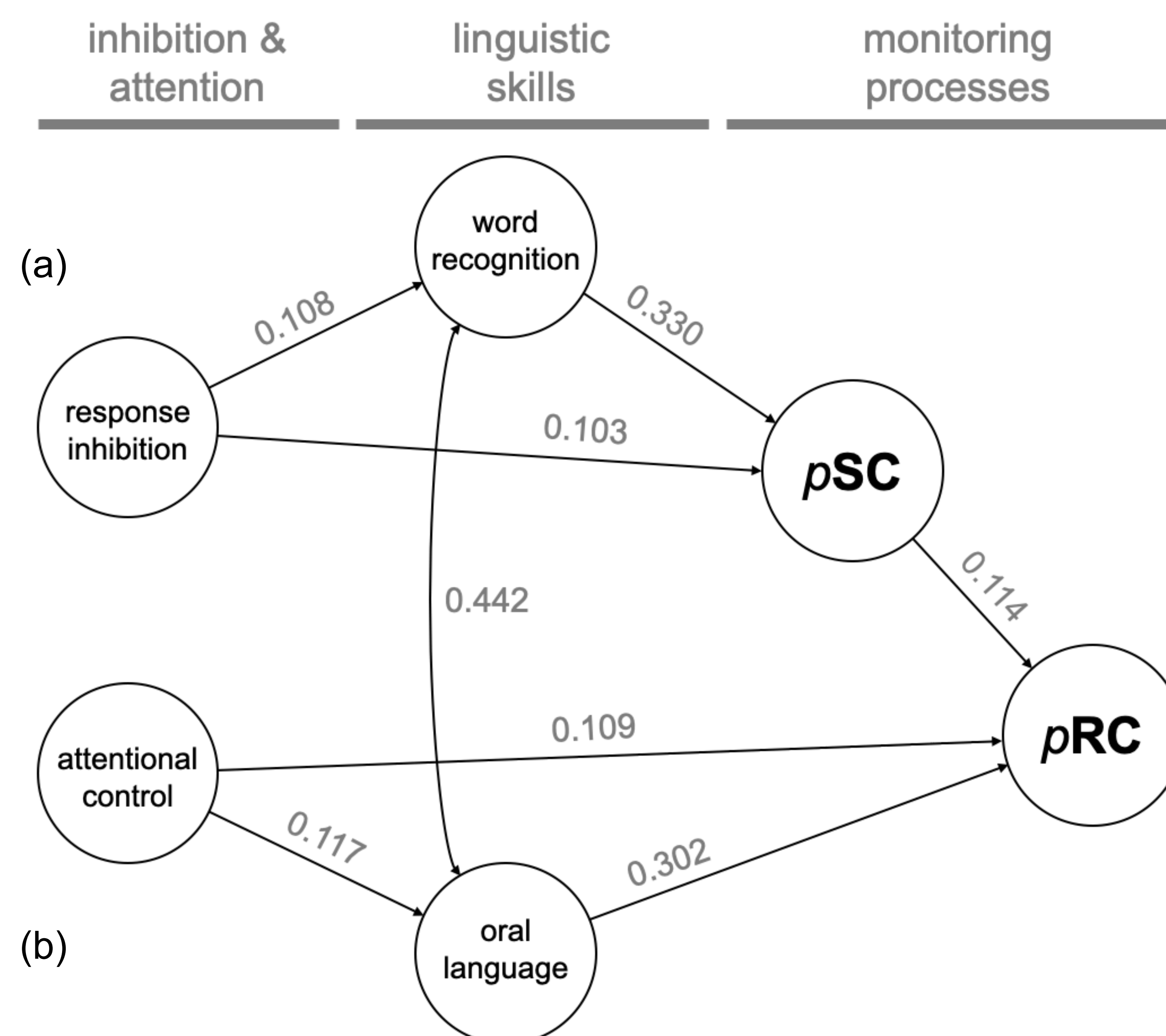


Fig. 1. Final path model for the direct and indirect effects of (a) inhibitory and (b) attentional abilities in monitoring processes through known linguistic skills.

Table 1. Summary findings for the effects of (a, b) inhibitory and (c) attentional abilities in monitoring processes through known linguistic skills.

	Path	<i>b</i>	<i>se</i>	<i>p</i>
(a)	response inhibition → <i>pSC</i>	0.103	0.039	0.009
	response inhibition → word recognition → <i>pSC</i>	0.036	0.015	0.018
(b)	response inhibition → <i>pSC</i> → <i>pRC</i>	0.012	0.006	0.042
	response inhibition → word recognition → <i>pSC</i> → <i>pRC</i>	0.004	0.004	0.279
(c)	attentional control → <i>pRC</i>	0.109	0.046	0.018
	attentional control → oral language → <i>pRC</i>	0.035	0.015	0.019

Discussion

Monitoring processes in students' reading performance were revealed to be associated with specific linguistic skills.

- Increased *pSC* was predicted by better **word recognition**. This is consistent with prior studies in that phonological and decoding skills support self-correcting word-reading errors^{1,4}.
- Higher *pRC* was explained by greater **oral language**, which signifies that semantic skills support recalling key versus trivial ideas^{1,4}.

Students' **monitoring processes** were found to be uniquely correlated with their inhibitory and attentional abilities.

- Increased *pSC* was predicted by greater **response inhibition**, implicating its role in detecting and correcting word-reading errors.
- Higher *pRC* was explained by better **attentional control**, which could facilitate reading engagement and recalling important ideas.

Moreover, inhibitory and attentional abilities appeared to promote **monitoring processes** in children's reading performance through specific linguistic skills.

- The predictive effect of **response inhibition** in *pSC* was explained indirectly through **word recognition**, which suggests that phonological skills in detecting and self-correcting word-reading errors are critical.
- The predictive effect of **attentional control** in *pRC* was explained indirectly through **oral language**, which highlights the role that semantic skills play in reading engagement and recalling important ideas.

Summary: These results indicate that, in addition to and through linguistic skills, inhibitory and attentional abilities are linked to students' monitoring processes in reading.

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