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Non-word repetition in Dutch-speaking children with specific language impairment with and without reading problems

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Recently, English studies have shown a relationship between non-word repetition (NWR) and the presence of reading problems (RP). Children with specific language impairment (SLI) but without RP performed similarly to their typically developing (TD) peers, whereas children with SLI and RP performed significantly worse on an NWR task. The current study was undertaken to investigate whether this difference in NWR performance is also found in a language with a transparent orthography – Dutch. The study included 15 TD children and 29 children with SLI. All children performed an NWR task that included non-words of 2–5 syllables in length. Children with SLI − RP ($N = 11$) did not differ on any of the four conditions from the TD group, whereas the children with SLI + RP ($N = 18$) scored more poorly on the 3-, 4-, and 5-syllable items compared to the TD group. NWR performance was significantly poorer on the 3- and 4-syllable conditions for children with SLI + RP compared to SLI − RP. To conclude, NWR is specifically affected in children with SLI + RP who are learning to read and write in a transparent orthography. Our data underline the dependency relation between literacy development and NWR performance in children with SLI.

Non-word repetition

Repeating a non-word is not as easy as it may seem and to do it correctly, multiple skills are needed. The non-word has to be analysed auditorily, it has to be stored in and retrieved from phonological short-term memory, and, of course, it has to be articulated as well. Which of these skills is most important in non-word repetition (NWR) is not yet decided upon, but a lot of attention has been paid to the role of phonological short-term memory in this process (Gathercole, 2006). One piece of evidence for the role of phonological short-term memory in NWR is the observation that longer non-words are

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more difficult to repeat than shorter non-words. This so-called length effect is attributed to memory capacity. Longer words are more demanding with respect to phonological short-term memory than short words so that eventually the phonological loop, in which the non-words are temporarily being maintained, can get overloaded. Other hypotheses discuss the role of size and quality of the vocabulary in NWR (see Metsala, Stavrinos, & Walley, 2009).

Recent studies have shown that linguistic variables are influential on the performance of an NWR task. Phonotactic probability (Munson, Kurtz, & Windsor, 2005), wordlikeness (Archibald & Gathercole, 2006), phonological complexity (Marshall & van der Lely, 2009), and prosody (Gallon, Harris, & van der Lely, 2007) have all been found to be impacting on NWR ability. However, even though multiple factors are associated with NWR performance, the majority of researchers would agree that NWR reflects, to a certain extent, phonological processing.

Non-word repetition in specific language impairment

Recently, NWR in children with specific language impairment (SLI) has received considerable attention. SLI refers to a developmental language disorder that is unexpected based on the normal cognitive, emotional, and sensorineural abilities of a child and sufficient opportunity to develop language. Children with SLI form a heterogeneous group with respect to their language profiles, which hampers the identification of a possible unitary deficit underlying their language problems. Nevertheless, numerous recent studies have demonstrated that children with SLI suffer from a severe impairment in NWR. This NWR impairment has been proposed as a clinical marker for SLI. Research conducted in different languages, for example in English (Bishop, North, & Donlan, 1996; Conti-Ramsden, Botting, & Faragher, 2001; Ellis-Weismer *et al.*, 2000), Spanish (Girbau & Schwartz, 2007), Italian (Bortolini *et al.*, 2006), and Dutch (De Bree, Rispens, & Gerrits, 2007; De Bree, Wijnen, & Gerrits, 2010) all demonstrated that children with SLI repeat non-words significantly less accurately than typically developing (TD) children.

Yet, it has also been suggested that a deficit in NWR is not typical for the whole group of children with SLI, but that it is related to the presence of reading problems (RP; Catts, Adlof, Hogan, & Ellis Weismer, 2005). There is strong evidence that SLI and RP (developmental dyslexia) are overlapping disorders (Messaoud-Galusi & Marshall, 2010). For example, McArthur, Hogben, Edwards, Heath, and Mengler (2000) observed that half of a population of children diagnosed with SLI could also be diagnosed with developmental dyslexia and the other way around. A phonological processing deficit, including impaired NWR and poor phonological awareness, has often been argued to lie at the heart of the literacy problems experienced by children with developmental dyslexia (Snowling, 2000; Szenkovits & Ramus, 2005).

Non-word repetition in SLI children with and without RP

Catts *et al.* (2005) investigated the relationship between RP and NWR ability in children with SLI. They divided the children with SLI that participated in their study into two subgroups: a group of children with SLI-only and a group of children who also had concomitant RP. The results showed that the SLI-only subgroup performed significantly better on the NWR task than the SLI group who also had RP. Catts *et al.* (2005) hypothesize, based on these findings, that SLI-only is not associated with phonological processing problems (as measured with a NWR task) but that only those children with SLI that also have developmental dyslexia are severely impaired in NWR.

Conti-Ramsden and Durkin (2007) investigated the development of literacy skills and their relation to phonological processing abilities more closely. They followed a group of children with SLI with or without concomitant RP longitudinally from 11 to 14 years of age. Their results confirmed the findings of Catts *et al.* (2005) as children with SLI-only scored significantly better than the children with SLI and RP on an NWR task both at 11 and 14 years of age. A regression analysis pointed to a reciprocal relationship between NWR and reading development. NWR performance measured at 11 years was associated with reading ability (word recognition) at 14 years of age. Moreover, word recognition at 11 years significantly predicted NWR at 14 years. Conti-Ramsden and Durkin (2007) accordingly suggest that the poor NWR performance of children with SLI with RP may stem from the poor literacy skills of those children.

Bishop, Hayiou-Thomas, McDonald, and Bird (2009) also explored the developmental trajectory of the relation between reading skills and NWR and followed a group of children with SLI longitudinally from 4 to 9 years of age. At the age of 9, the children with SLI were divided in two subgroups: SLI-only and SLI + dyslexia. The results showed that at 9 years of age, the group of SLI-only children outperformed the children with SLI + dyslexia on the NWR task and that there was no significant difference in performance on the NWR task between the TD children and the children with SLI-only. No differences in language measures were found between the SLI-only and the SLI + dyslexia groups. These results are different from those obtained at 4 years, when there was no difference in NWR ability between SLI-only children and children with SLI + dyslexia (in retrospect), and both groups scored more poorly than the TD children. Bishop *et al.* (2009) have a similar interpretation of their findings to that of Conti-Ramsden and Durkin (2007). They argue that reading acquisition facilitates NWR ability, and that the NWR differences at 9 years between the two groups of children with SLI do not reflect a difference in underlying phonological processing ability, but are instead the consequence of a difference in orthographic knowledge.

Bidirectional relationship between NWR and literacy

The idea that reading skills influence NWR performance (and other phonological processing abilities) has also been reported from a field other than that of developmental language disorders, namely the study of adults who are illiterate. Castro-Caldas, Petersson, Reis, Stone-Elander, and Ingvar (1998) and Petersson, Reis, Askelöf, Castro-Caldas, and Ingvar (2000) carried out a PET (Position Emission Tomography) study to investigate the influence of literacy on the organization of the brain. The behavioural results showed that their illiterate subjects (adult Portuguese women) performed less well on a NWR measure than the literate subjects, but, importantly, that there were no differences on real word repetition. Their study further showed differences in the level of brain activation during NWR between the literate and the illiterate subjects. Petersson *et al.* (2000) conclude that learning an orthographic representation system for an alphabetic system will result in a modified network for processing spoken language. Specifically, the finding that there were no differences between literate and illiterates in real word repetition suggests that the acquisition of orthographic knowledge has a modulatory influence on sublexical phonological processing.

The bidirectional relationship between literacy development and sublexical processing has also been demonstrated through the relationship between phoneme awareness and the course of reading acquisition. Goswami (2000), for example, discusses that reading acquisition influences phoneme-level information as the feedback provided by graphemic information helps a child to represent segmental information at the phonemic level. There is evidence that this reciprocal relationship between phoneme awareness and reading acquisition depends on the orthography that the child is learning. If a child is learning a fairly transparent orthography – like Dutch or German – the phonemic level is addressed in a reliable way as the same letters consistently map to the same sounds (at least in reading). In contrast in English, which has an opaque orthography, reading acquisition will not provide a child with reliable feedback about the phonemic level as the mappings are inconsistent. Thus, reading acquisition is hypothesized to improve phonemic awareness and phonemic restructuring, and children who learn to read a more transparent orthography may be at an advantage for this. A study into the development of phonological skills in Dutch dyslexic children supports this idea. De Jong and van der Leij (2003) found that the level of phonemic awareness of Dutch dyslexic children, who learn to read a fairly transparent orthography, increases over time and progresses to be comparable to that of control children. This is different from the findings of English studies of children with dyslexia that have repeatedly shown that problems with phonemic awareness persist into adulthood (Bruck, 1992; Pennington, Van Orden, Smith, Green, & Haith, 1990).

Current study

Above, we have discussed evidence that NWR performance in children with SLI is related to the presence of RP. The reason for this dependency is not clear. It may be the case that difficulties with phonological processing (reflected in low NWR accuracy) give rise to RP, or conversely, because the poor development of orthographic knowledge interferes with development of sublexical phonological skills that are needed for adequate NWR. As was discussed, the transparency of the orthographic system that a child is learning influences the level of phonemic awareness and sublexical processing. In order to investigate whether the difference in NWR between children with SLI with and without concomitant RP is caused by the lack of facilitation of orthographic knowledge, it is necessary to carry out cross-linguistic comparisons. As the three aforementioned studies into the NWR deficit in SLI have been carried out in English, which has an opaque orthography, the present study will compare NWR performance in Dutch children with SLI with and without RP who are learning to read and write a relatively transparent orthography. If the transparency of the orthography aids sublexical processing, which is expected even for children who have difficulty with the acquisition of orthographic knowledge, no difference in NWR performance is anticipated between the two groups. The results will be used to evaluate the claim that a deficit in NWR in children with both SLI and reading difficulties is related to the reciprocal relationship between NWR and literacy development, and will therefore add to the insight into the relation between NWR and literacy status in children with SLI.

As we are comparing groups of children who differ in their literacy abilities, we have to take great care in the design of the NWR task in order to avoid confounding effects caused by linguistic complexity of the NWR items. Marshall and van der Lely (2009) investigated the impact of word position and stress of consonant clusters within non-words on NWR performance in children with SLI and developmental dyslexia. They showed, importantly, that the performance of children with SLI and children with dyslexia differed in a qualitative way. Both groups of children were affected by the word position of the cluster, but only the children with dyslexia had more difficulty realizing an unstressed cluster as compared to a stressed cluster. As the aim of our study is to investigate performance profiles on a NWR task within the population of SLI children to evaluate the effect of the transparency of the orthography, we need to control the phonological demands of our task. We therefore administered a Dutch NWR task described by De Bree (2007) in which the items do not contain any consonant clusters and follow the prosody and word stress of the phonological rules of the Dutch language.

Method

Participants

Two groups of children with Dutch as their native language, with a mean age of 8;3 participated (see Table 1): 29 children with SLI and 15 TD children. The children with SLI all attended special schools for children with developmental language disorders and they had been diagnosed with SLI by a team of specialists including a psychologist and a speech and language therapist. SLI was diagnosed when a child performed at least 1.5 *SD* below the mean in at least two language domains measured with Dutch standardized language tests, or when a child performed more than 2 *SD* below the mean on a Dutch standardized general language test. Non-verbal intelligence was examined with the help of Dutch standardized psychological tests including the SON-R (Snijders-Oomen niet-verbale intelligentietest; Snijders, Tellegen, & Laros, 1989), the RAKIT (Revisie Amsterdamse Kinder Intelligentietest; Bleichrodt, Drenth, Zaal, & Resing, 1984), or (subtests of) the WISC-R (Wechsler Intelligence Scale for Children—Revised; Van Haasen *et al.*, 1986). Only children with an IQ of 80 and up (SON-R and RAKIT) or with a standard score of 7 and up (WISC-R) participated. Children with SLI who also showed speech production problems, such as dyspraxia, were excluded to avoid any interference of their articulation problems with NWR performance.

Table 1. Age in months, word reading (RWT) scores and non-word reading (PWT) scores and MLU in words in TD and SLI (sub) groups

		SLI subgroups	
	TD ($N = 15$) Mean (*SD*)	SLI − RP ($N = 11$) Mean (*SD*)	SLI + RP ($N = 18$) Mean (*SD*)
Age	99.33 (5.53)	101.8 (3.63)	98.11 (4.96)
RWT	8.73 (2.02)	7.90 (2.12)	2.44 (2.04)
PWT	9.13 (1.19)	8.72 (2.10)	2.94 (1.89)
MLU	7.17 (0.98)	5.90 (0.68)[a]	5.52 (0.83)[b]

[a] $N = 5$.
[b] $N = 13$.

Two Dutch standardized reading tasks that are commonly used to diagnose developmental dyslexia (Kuijpers *et al.*, 2003) assessed the presence of RP: the real word task (RWT; Brus & Voeten, 1973) and a pseudo-word task (PWT; van den Bos, Spelberg, Scheepstra, & de Vries, 1994). In the RWT, a list of existing words is presented which have to be read aloud as quickly and as accurately as possible within 1 min. The PWT follows the same principle, but uses non-words and takes 2 min. In The Netherlands, it is common to use timed reading tests to detect reading difficulties as speed is a better indicator of reading development than accuracy alone (De Jong & van der Leij, 2003). The raw score of the tasks is determined by the number of items read aloud correctly and can be converted to a standardized score with a mean of 10, and a *SD* of 3. RP are present when children score more than 1 *SD* below the mean on both the RWT and the PWT.

The group of children with SLI was subdivided in children + RP (mean score 0–6) and in children − RP (mean score 7 and higher; see Table 1). All the children + RP scored below 1 *SD* or more on both the PWT and the RWT. Two children in the group of children with SLI − RP scored within the normal range of the mean for the two reading tasks, but their performance on the RWT was 1 *SD* below the mean (a standard score of 5 and 6, respectively) and an average score on the PWT. Tests of word recognition and decoding were used rather than reading comprehension tasks as it has been demonstrated that the latter ability is more related to oral language skills and the purpose of our study was to investigate the relation between NWR and word decoding and recognition.

Analyses of variance (ANOVA) showed that there was no group difference for age $F(2, 41) = 1.9$, $p = .15$, but that there were significant group differences for non-verbal IQ $F(2, 41) = 9.2$, $p = .001$, word recognition (RWT) $F(2, 41) = 45.2$, $p < .001$, and word decoding (PWT) $F(2, 41) = 63.4$, $p < .001$. *Post hoc* tests (Games–Howell) demonstrated that the mean non-verbal IQ score of the TD group was higher compared to both SLI groups ($p < .008$), but that there were no differences between the two SLI subgroups ($p = .41$). As was to be expected, the SLI − RP group's reading scores (RWT and PWT) did not differ from those of the TD group ($p > .59$) and the scores of the SLI + RP group differed significantly from both the SLI − RP group and the TD group ($p < .001$). We cannot report whether the level of oral language skills was comparable between the two subgroups of children with SLI as different language measures had been used for the diagnosis of SLI. In order to be able to compare oral language functioning between the two groups, we calculated the mean length of utterance (MLU) on the basis of a sample of spontaneous speech that we elicited in the majority of the participants by asking them to retell the 'Frog story' (Mayer, 1969). MLU was computed in order to obtain a rough estimation of syntactic complexity. MLU was not calculated in morphemes, but in words, which is more appropriate given the age of the children in this study (Wells, 1985). We were able to calculate MLU for 5 out of the 11 children with SLI − RP, for 13 out of the 18 children with SLI + RP, and for all the TD children ($N = 15$). An ANOVA showed that there was a significant group difference, $F(2, 31) = 11.9$, $p < .001$, and *post hoc* tests indicated that the TD children had a higher MLU in comparison with both subgroups with SLI (SLI + RP vs. TD, $p < .001$; SLI − RP vs. TD, $p = .03$) but that there was no difference between the two subgroups of children with SLI (SLI + RP vs. SLI − RP, $p = .59$). Table 1 presents the mean MLU per subgroup.

Materials

The Dutch NWR task reported in De Bree (2007) was used. This task is based on Dollaghan and Campbell's task (1998). It contains 16 non-words of 2–5 syllables in length that conform to the Dutch phonotactic system. Each syllable length is tested with four items and the task starts with three practice items. The items did not contain any consonant clusters. Wordlikeness was minimized so that the whole non-word and each syllable were non-existent in the Dutch language. All non-words comprised consonants and syllable types that are typically acquired early in development, to minimize articulation difficulties. Only tense vowels were used (that can occur in an unstressed syllable in Dutch) as they have longer duration and increased perceptibility. Examples are 'sooteif' and 'beepoetamuuf' (also see Appendix). They were spoken aloud by a female native speaker and were pre-recorded. The non-words were played back to the subject on a laptop computer with loudspeakers. Repeated presentations of the items were not allowed. The responses of the subjects were recorded on a digital video-camera and were transcribed after the testing session. The total number of items repeated back correctly was calculated and in addition the percentage of phonemes repeated correctly (PPC) for each word type (2- to 5-syllable words) was computed.

Results

Table 2 displays the number of non-words repeated correctly and the PPC per word length for each of the three groups. An ANOVA was used to examine group differences for the mean number of non-words repeated correctly. A significant effect of group, $F(2, 43) = 5.99$, $p = .005$, for the mean scores was revealed. *Post hoc* tests (Games–Howell) showed that the TD children repeated significantly more non-words correctly than the children with SLI + RP ($p = .013$). The TD children performed similarly to the children with SLI − RP ($p = .66$). The two subgroups of children with SLI differed significantly from each other ($p = .04$) with the children with SLI − RP repeating more items correctly.

Table 2. Mean total score and phoneme percentage correct (PPC) per length on non-word repetition for TD and SLI (sub)groups

		Subgroups of SLI	
Length	TD (*N* = 15) Mean (*SD*)	SLI − RP (*N* = 11) Mean (*SD*)	SLI + RP (*N* = 18) Mean (*SD*)
Mean score correct	6.6 (2.77)	5.82 (1.78)	3.94 (2.04)[a]
2 syllables	94% (5%)	92% (4%)	90% (11%)
3 syllables	94% (6%)	90% (8%)	82% (10%)[a]
4 syllables	82% (12%)	76% (12%)	62% (16%)[a]
5 syllables	71% (13%)	60% (15%)	49% (17%)[b]

[a] Significantly less than TD and SLI–RP group.
[b] Significantly less than TD group.

To examine the performances in more detail, a repeated measures ANOVA procedure was carried out with respect to the PPC per word length. The results showed a significant effect of group, $F(2, 41) = 10.54$, $p < .001$, length, $F(3, 123) = 124.47$, $p < .001$, and an interaction between group × length, $F(6, 123) = 3.67$, $p = .005$. *Post hoc* tests (Games–Howell) showed that the three groups did not differ on the 2-syllable items, but that the children with SLI + RP scored significantly worse on the 3- and 4-syllable items than the children with SLI + RP ($p < .05$). The children with SLI + RP performed significantly worse than the TD group on all conditions with the exception of the 2-syllable items (3- to 5- syllable items: $p < .001$). The performance of the SLI group – RP did not differ from that of the TD children on any of the conditions ($p > .14$).[1]

[1] *As was discussed in the* Method *section, two of the children with SLI–RP had below average scores on the RWT (but their mean performance on both the RWT and PWT was within normal limits). Exclusion of these participants did not change the results and therefore we have included them in our experimental group.*

Discussion

The current study aimed to investigate the relationship between the presence of RP and performance on a NWR task in Dutch-speaking children with SLI who are learning to read and write in a fairly transparent orthography. The findings show that there is indeed a relationship. The children with SLI − RP did not, on any of the four conditions, differ from the TD group, whereas the children with SLI + RP scored more poorly on the 3-, 4-, and 5-syllable items compared to the TD group. The children with SLI + RP performed significantly worse on the 3- and 4-syllable items than the children with SLI − RP. The groups all performed similarly on the 2-syllable items. The absence of difficulties with the repetition of short words fits the length effect described in the introduction.

Our results converge with the findings of Bishop *et al.* (2009) and Catts *et al.* (2005) who reported that NWR in English-speaking children with SLI who also had RP was significantly worse when compared to children with SLI without RP. Our findings not only corroborate previous findings on NWR performance in children with SLI, but also extend these as there seems to be no difference with respect to the transparency of the orthography that children are learning. Our research thus indicates that the reports about the problems with NWR for English-speaking children with SLI + RP are not a result of the opaque orthography, but that this observation also holds in a language with a relatively transparent orthography. Of course, the children need to be re-assessed at around the age of 12 years old, as then they will have had even more experience with orthography in order to evaluate the relationship between literacy and NWR performance more conclusively.

What do these data tell us about the relationship between NWR and literacy development in SLI? As we have only measured NWR and reading skills at a single point in time, we cannot convincingly answer this question, as both directions of the causality can explain our data. However, a recent study of De Bree *et al.* (2010) showed that at the age of 4 years there was no difference in NWR performance (using the same task as in the current study) between Dutch-speaking children with SLI-only and children with both SLI and RP (diagnosed at 8 years of age). Combining our findings with those of De Bree *et al.* (2010), who unfortunately did not retest NWR at 8 years of age, we can support the conclusion of Bishop *et al.* (2009) that children with SLI have weak NWR ability but that good literacy skills can help children to progress in their NWR performance. Conversely, children with poor literacy skills cannot profit from the feedback that the acquisition of orthographic knowledge provides and consequently, their NWR performance does not improve. Our results suggest that even in a language with a fairly consistent orthography NWR performance in children with reading difficulties is not facilitated by their experience with orthography. An important investigation for further research is to compare children with dyslexia – without SLI – to SLI children with and without RP to investigate the overlap between SLI and developmental dyslexia, and thus the relation with literacy level and NWR. If NWR is facilitated by orthographic knowledge, we expect that children with dyslexia perform as poorly as the SLI children with RP and that both groups are outperformed by SLI-only children.

A more practical conclusion of our research is that clinicians need to be cautious about the diagnostic value of NWR for children with SLI after kindergarten age. Gray (2003) reports that NWR (the children's test of non-word repetition (CNRep) task of Gathercole & Baddeley, 1996) seems a useful instrument to distinguish between preschool children with and without SLI, as it has good sensitivity (identifying an individual with SLI as SLI) and specificity (identifying only children with SLI as SLI). However, this may not hold for children at an age at which they have had the opportunity to develop literacy skills, as this can influence NWR ability. An improvement in NWR during early school years may therefore not necessarily mean that language problems in other domains have resolved. This is especially important for clinicians working with older children with SLI, as in many countries the diagnosis of these children needs to be reconfirmed every couple of years. Only in combination with other tests, measuring, for example, linguistic skills such as morphosyntax and vocabulary, NWR can be used to evaluate the presence of language impairment in school-age children.

As was described in the introduction, another factor, apart from literacy level, that affects NWR performance in children with SLI is the linguistic make-up of the stimuli. Different NWR tasks therefore make it difficult to compare findings across studies. For example, Marshall and van der Lely (2009) showed that children with SLI, but without RP, performed more poorly on NWR than TD children in contrast to both the present results and those of Bishop *et al.* (2009) and Catts *et al.* (2005). The difference between the study of Marshall and van der Lely (2009) and the other ones, could be explained by the differences in the non-words themselves. All the items of the NWR task used by Marshall and van der Lely (2009), contained consonant clusters, which were varied on word position and stress. The task that was used in the current experiment did not include any consonant clusters, just like the task administered by Catts *et al.* (2005). Bishop *et al.* (2009) used the CNRep (Gathercole & Baddeley, 1996) in which half of the items contains consonant clusters. The task that Marshall and van der Lely (2009) administered is thus most complex with respect to phonology, and this may have caused the difficulty for the SLI-only children in their study, as compared to the SLI-only children in the other studies. An important issue that needs consideration in the research on NWR in SLI, and of course in other populations, is thus that several factors influence the results on such a task. Literacy level of the children is an important one, but also the linguistic complexity of the NWR task.

Finally, an area that needs to be explored with respect to the causal relationship between literacy development and NWR is the short-term and working memory profiles of the children with SLI with and without RP. Archibald and Joanisse (2009) found that language impairment was often, but not always, associated with phonological short-term memory deficits and more general working memory deficits in a population of kindergartners (5–6 years of age). The relationship between NWR performance, literacy, and phonological short term and working memory capacity in SLI needs further investigation to gain insight into the problems underlying poor NWR performance.

Summary

To conclude, the present research showed that Dutch-speaking children with SLI, but without RP, who are learning to read a fairly consistent orthography, performed similarly to their TD peers on an NWR task. This was also found in English studies in which children are learning an opaque orthography. Our findings underline the idea that the difference in NWR performance between SLI children with and without RP may stem from the fact that the former group does not benefit from literacy skills as much as the latter group does, even when children are learning a consistent orthography.

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Appendix

NWR items (De Bree, 2007)

Practice items (3x): toes, juifoot, jeemuiboovaus

Test items (16x):

2-syllable length: sooteif, feupaan, waaduis, jienoes

3-syllable length: joeseewaup, waafijsien, suutaumief, doolieneif

4-syllable length: beepoetaamuuf, hiejeemuuteip, puusoedaujien, toopeusiewoem

5-syllable length: hiepeusoefuuteem, baawoovuujiezaun, wuutaamoobeejuin, fooneiwuisoetaam