Acadience® RAN
Assessment Manual
(Spanish-Language Directions)

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Overview

Basic Early Literacy Skill	None
Administration Time	Ranges from approximately 30 seconds to 2 minutes (students will complete the entire form)
Administration Schedule	Beginning of kindergarten to the end of first grade
Score	Total time, in seconds, to complete a form. Errors also are counted and reported.
Wait Rule	If the student does not respond within 3 seconds on an item, mark a slash (**/**) through the item, tell the student the name of the item, point to the next item and say, ***Continúa.***
Discontinue Rule	If the student makes any errors in naming the items on the second practice trial, discontinue, mark the discontinued box on the scoring booklet, and do not record time or errors. If the student makes four errors in the first two rows of the Test Form, discontinue, mark the discontinued box on the scoring booklet, and do not record time or errors.

What Is RAN?

Rapid Automatized Naming (RAN) is a task that involves quickly and accurately naming repeated sets of *familiar* items. Although RAN is typically a good predictor of future reading difficulties, difficulties with RAN do not impact reading skills as much as difficulties with phonological awareness (PA) (Georgiou et al., 2011; Pennington et al., 2001). When students have strong PA skills, but have difficulties with RAN, the impact on reading skills is typically milder than when students have difficulties with both RAN and PA (see Kilpatrick, 2015).
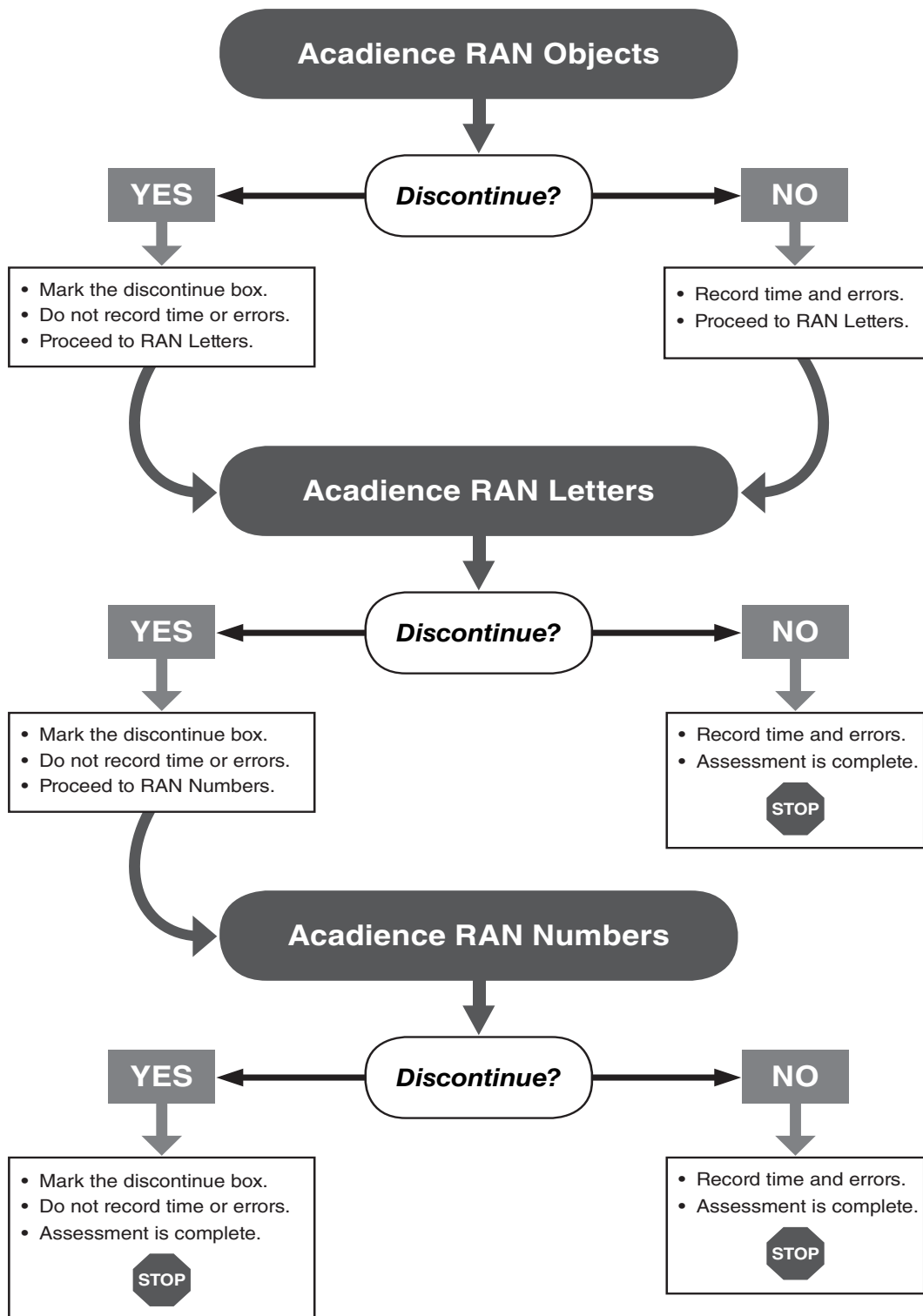
While there is considerable research support for RAN as a strong predictor of reading skill, variation in the strength of the relation between RAN skill and reading skill is also evident (see Araújo et al., 2015 for discussion). Notably, Kilpatrick (2015) states that at this time, a research-based means to directly improve RAN is not known; however, there is evidence to suggest that meaningful improvement in reading skills is associated with improvements in RAN. Therefore, Acadience® RAN is offered as an optional assessment for users of Acadience® Reading K–6 and may be used as an additional risk indicator.

Overview of Acadience RAN

The Acadience RAN measures are based on established procedures for creating and interpreting RAN tasks used in decades of research by multiple researchers. Acadience RAN is composed of three brief measures that are administered individually: RAN Objects, RAN Letters, and RAN Numbers. Students begin with RAN Objects and proceed to RAN Letters. RAN Numbers is only administered to students who discontinue on the RAN Letters task. See *Figure 1* for an illustration of the sequence in which Acadience RAN measures are given. A Spanish version of Acadience RAN is available. For more information, email info@acadiencelearning.org.

Assessment Materials

The Acadience RAN assessment materials are organized in scoring booklets and student materials labeled Form A and Form B. Form A and Form B contain enough assessment materials to test students three times per year (e.g., beginning of year, middle of year, end of year). The materials are not labeled by grade level because they are identical with no differences in difficulty level. Form A may be used for kindergarten and Form B may be used for first grade.

Figure 1. Sequence of Acadience RAN Measures

RAN Objects

Grade Level(s): K & 1   *Targeted Skill:* Rapid Naming (non-alphanumeric)

RAN Objects assesses a student's skill in rapidly naming a set of familiar objects. The student is first shown a set of five common objects (e.g., sol, zapato, gato, árbol, silla) arranged in a random order and then asked to name each picture. Correction is provided as needed. This is a practice trial completed before the measure in order to ensure that the objects pictured are familiar to the student. If the student cannot correctly name all the objects, the assessment is discontinued and the student is administered RAN Letters.

For the test, the student is shown a page of the same five objects repeated at random in 10 rows (i.e., a different random order in each row) and asked to name the pictures as quickly as possible. If a student hesitates for more than 3 seconds on an object, he/she will be told the name of the object, and that object will be marked as an error. Any object named incorrectly will also be marked as an error. The assessor times the student and then records the amount of time in seconds it takes the student to name all the objects on the page. Errors are also recorded. After being administered RAN Objects, students should be administered RAN Letters, even if they discontinued RAN Objects.

Objects were selected based upon their familiarity to young children and the ability to provide a simple stimulus picture for the object that was unlikely to be confused or named as another object. Once objects were selected, simple pictures (i.e., line drawings) were created to represent them. The row of practice pictures was randomized. Forms were created by randomly ordering the pictures in each row. In instances where a picture appeared in the same column for three consecutive rows, rows were re-randomized until that no longer occurred. All randomization was completed using the "RAND" function in Microsoft Excel.

RAN Letters

Grade Level(s): K & 1   *Targeted Skill:* Rapid Naming (alphanumeric)

RAN Letters assesses a student's skill in rapidly naming a set of familiar letters. The student is first shown a set of five uppercase letters (C, A, X, O, B) arranged in a random order and then asked to name each letter (Ce, A, Equis, O, Be). Correction is provided as needed. This practice trial is completed before the assessment in order to ensure that the letters are familiar to the student. If the student cannot correctly name all the letters, the measure is discontinued and the student is administered RAN Numbers.

For the test, the student is shown a page of the same five letters repeated at random in 10 rows (i.e., a different random order in each row) and asked to name the letters as quickly as possible. If a student hesitates for more than 3 seconds on a letter, he/she will be told the letter, and that letter will be marked as an error. Any letter named incorrectly will also be marked as an error. The assessor times the student and then records the amount of time in seconds it takes the student to name all the letters on the page. Errors are also recorded.

The item pool for RAN Letters was selected based upon the degree of familiarity found in recent research (Evans et al., 2006). Once letters were selected, the row of practice letters was randomized. Forms were created by randomly ordering the letters in each row. In instances where a letter appeared in the same column for three consecutive rows, rows were re-randomized until that no longer occurred. All randomization was completed using the "RAND" function in Microsoft Excel.

RAN Numbers

Grade Level(s): K & 1   *Targeted Skill:* Rapid Naming (alphanumeric)

RAN Numbers assesses a student's skill in rapidly naming a set of familiar numbers. RAN Numbers is only administered to students who discontinue on RAN Letters. The student is first shown a set of five numbers (3, 4, 2, 7, 6) arranged in a random order and then asked to name each number (tres, cuatro, dos, siete, seis). Correction is provided as needed. This practice trial is completed before the assessment in order to ensure that the numbers are familiar to the student. If the student cannot correctly name all the numbers, the measure is discontinued.

For the test, the student is shown a page of the same five numbers repeated at random in 10 rows (i.e., a different random order in each row) and asked to name the numbers as quickly as possible. If a student hesitates for more than 3 seconds on a number, he/she will be told the number, and that number will be marked as an error. Any number named incorrectly will also be marked as an error. The assessor times the student and then records the amount of time in seconds it takes the student to name all the numbers on the page. Errors are also recorded.

Numbers selected for inclusion in the Acadience RAN Numbers task were chosen based upon their familiarity to young children. Once numbers were selected, the row of practice numbers was randomized. Forms were created by randomly ordering the numbers in each row. In instances where a number appeared in the same column for three consecutive rows, rows were re-randomized until that no longer occurred. All randomization was completed using the "RAND" function in Microsoft Excel.

Technical Adequacy

Research on Previously Existing RAN Measures

There is an abundance of research on previously existing RAN measures, which are very similar to the Acadience RAN measures. This previous research suggests that RAN is a reliable measure that is predictive of performance on a variety of reading and reading-related skills. For example, in prior research, most predictive validity correlations fall into the moderate range. Results of several predictive validity studies on RAN are detailed in the tables found in the appendix.

Preliminary Research on Acadience RAN

Acadience Learning has conducted preliminary research on Acadience RAN to examine the validity of its measures in relation to Acadience Reading K–6 measures in kindergarten and first grade. Data used for this research consisted of kindergarten and first grade Acadience RAN and Acadience Reading scores collected and entered into Acadience Data Management by school personnel during the 2018–2019 school year and the beginning of the 2019–2020 school year. The sample included 4,955 students from 50 schools in 17 school districts in 8 states representing every census region of the United States.

Criterion-related validity is the degree to which performance on a criterion measure (i.e., Acadience Reading K–6) can be estimated from performance on an assessment (i.e., Acadience RAN). Evidence of validity is measured as a correlation between the assessment and the criterion. Concurrent validity estimates how well student performance on the assessment is related to performance on the criterion when both measures are given at roughly the same time. Predictive validity estimates how well student performance on the assessment predicts student performance on the criterion given at a later time.

The results from our preliminary research are summarized in *Tables 1.1–1.4*. Overall, the correlations between student performance on the Acadience RAN measures and the Acadience Reading measures range from moderate to moderate-strong, with most being significant, $p < .0001$. All significant correlations are negative, meaning less

time spent completing the RAN measures (i.e., lower time scores) was associated with higher scores on Acadience Reading measures. Likewise, greater time spent completing the RAN measures (i.e., higher time scores) was associated with lower scores on Acadience Reading. Please note that due to sample size limitations in first grade, only concurrent validity at the beginning of year could be calculated.

To test the incremental validity of Acadience RAN, reading outcomes were predicted based on the Reading Composite Score (RCS) and RAN. RAN was treated as a latent variable and was used, along with the RCS from the same time of year, to predict the RCS for the subsequent time of year. For instance, the end-of-year kindergarten RCS was predicted from the middle-of-year RCS and middle-of-year RAN. Incremental validity was tested by examining how much additional variance in later Reading Composite Scores was explained once RAN was included as a predictor. As measures of rapid naming have been compared to Letter Naming Fluency (LNF), the same procedure was conducted using LNF as a predictor to determine if RAN explained additional variance beyond that explained by LNF when predicting later reading outcomes.

The results of the models described above are summarized in *Table 1.5.* In every case, RAN explained additional variation in the outcome, regardless of controlling for either initial RCS or LNF. At the beginning of year, the incremental variance explained was substantial. An additional 18–20% of the variance in middle-of-year RCS was explained by RAN at beginning of year. The additional variance explained by RAN declined somewhat at later times of year but always remained significant. These results suggest that Acadience RAN provides additional information beyond that provided by other Acadience Reading measures in predicting later reading outcomes.

Moving forward, we will continue to conduct research on the Acadience RAN measures to examine their validity, reliability, and utility. Additional information and results will be posted to our website at www.acadiencelearning.org.

Table 1.1. Preliminary Concurrent Validity of Acadience RAN with Acadience Reading in Kindergarten

Acadience RAN Measure	Acadience Reading Measure by Time of Year					
	FSF	LNF	PSF	NWF CLS	NWF WWR	RCS
Beginning of Year						
Objects	-.34	-.47	–	–	–	-.47
Letters	-.39	-.62	–	–	–	-.59
Numbers	-.36	-.53	–	–	–	-.53
Total	-.40	-.59	–	–	–	-.58
Middle of Year						
Objects	-.17***	-.33	-.25*	-.28	-.11†	-.32
Letters	-.30	-.53	-.37	-.40	-.20**	-.51
Numbers	-.29*	-.52	-.46	-.47	-.21***	-.55
Total	-.24*	-.47	-.32	-.37	-.17***	-.44
End of Year						
Objects	–	-.58	-.35	-.49	-.39	-.57
Letters	–	-.70	-.33	-.57	-.50	-.65
Numbers	–	-.70	-.46	-.55	-.46	-.68
Total	–	-.71	-.42	-.57	-.47	-.68

Note: Data were exported from Acadience Data Management for the 2018–2019 school year and the beginning of the 2019–2020 school year. Time, in seconds, was the score examined for each Acadience RAN measure. The total is the sum of either (a) Objects time and Letters time or (b) Objects time and Numbers time. FSF = First Sound fluency, LNF = Letter Naming Fluency, PSF = Phoneme Segmentation Fluency, NWF CLS = Nonsense Word Fluency Correct Letter Sounds, NWF WWR = Nonsense Word Fluency Whole Words Read, RCS = Reading Composite Score. Dashes indicate the Acadience Reading measure is not administered at the specified time of year. Pairwise sample sizes: beginning of year = 1,726–2,468; middle of year = 138–211; end of year = 152–157. Unless marked, correlations significant, $p < .0001$; *$p < .001$; **$p < .01$; ***$p < .05$; † Not significant.

Table 1.2. Preliminary Predictive Validity of Acadience RAN with Acadience Reading in Kindergarten

Acadience RAN Measure	Acadience Reading Measure by Time Span					
	FSF	LNF	PSF	NWF CLS	NWF WWR	RCS
Beginning to Middle of Year						
Objects	-.22**	-.45	-.22*	-.38	-.20**	-.39
Letters	-.39	-.61	-.29*	-.53	-.16***	-.57
Numbers	-.41	-.48	-.22**	-.49	-.19***	-.50
Total	-.33	-.57	-.26*	-.50	-.19***	-.52
Beginning to End of Year						
Objects	–	-.49	-.18*	-.37	-.34	-.44
Letters	–	-.55	.04†	-.42	-.40	-.46
Numbers	–	-.49	-.12†	-.45	-.39	-.49
Total	–	-.58	-.05†	-.45	-.40	-.50
Middle to End of Year						
Objects	–	-.47	-.27	-.35	-.35	-.44
Letters	–	-.53	-.28	-.41	-.36	-.51
Numbers	–	-.53	-.28**	-.39	-.41	-.49
Total	–	-.54	-.28*	-.41	-.38	-.50

Note: Data were exported from Acadience Data Management for the 2018–2019 school year and the beginning of the 2019–2020 school year. Time, in seconds, was the score examined for each Acadience RAN measure. The total is the sum of either (a) Objects time and Letters time or (b) Objects time and Numbers time. FSF = First Sound fluency, LNF = Letter Naming Fluency, PSF = Phoneme Segmentation Fluency, NWF CLS = Nonsense Word Fluency Correct Letter Sounds, NWF WWR = Nonsense Word Fluency Whole Words Read, RCS = Reading Composite Score. Dashes indicate the Acadience Reading measure is not administered at the specified time of year. Pairwise sample sizes: beginning to middle = 139–221, beginning to end = 136–213, middle to end = 131–201. Unless marked, correlations significant, $p < .0001$; *$p < .001$; **$p < .01$; ***$p < .05$; † Not significant.

Table 1.3. Preliminary Predictive Validity of Acadience RAN at End of Kindergarten with Acadience Reading at Beginning of First Grade

Acadience RAN Measure	Acadience Reading Measure				
	LNF	PSF	NWF CLS	NWF WWR	RCS
Objects	-.50	-.23**	-.48	-.42	-.53
Letters	-.69	-.30*	-.58	-.51	-.67
Numbers	-.64	-.17***	-.55	-.47	-.61
Total	-.64	-.29*	-.57	-.50	-.65

Note: Data were exported from Acadience Data Management for the 2018–2019 school year and the beginning of the 2019–2020 school year. Time, in seconds, was the score examined for each Acadience RAN measure. The total is the sum of either (a) Objects time and Letters time or (b) Objects time and Numbers time. FSF = First Sound fluency, LNF = Letter Naming Fluency, PSF = Phoneme Segmentation Fluency, NWF CLS = Nonsense Word Fluency Correct Letter Sounds, NWF WWR = Nonsense Word Fluency Whole Words Read, RCS = Reading Composite Score. Pairwise sample sizes = 136–138. Unless marked, correlations significant, $p < .0001$; *$p < .001$; **$p < .01$; ***$p < .05$.

Table 1.4. Preliminary Concurrent Validity of Acadience RAN with Acadience Reading in Beginning of First Grade

Acadience RAN Measure	Acadience Reading Measure				
	LNF	PSF	NWF CLS	NWF WWR	RCS
Objects	-.53	-.18	-.37	-.31	-.47
Letters	-.70	-.26	-.51	-.42	-.64
Numbers	-.67	-.20	-.48	-.42	-.60
Total	-.67	-.23	-.48	-.40	-.60

Note: Data were exported from Acadience Data Management for the 2018–2019 school year and the beginning of the 2019–2020 school year. Time, in seconds, was the score examined for each Acadience RAN measure. The total is the sum of either (a) Objects time and Letters time or (b) Objects time and Numbers time. FSF = First Sound fluency, LNF = Letter Naming Fluency, PSF = Phoneme Segmentation Fluency, NWF CLS = Nonsense Word Fluency Correct Letter Sounds, NWF WWR = Nonsense Word Fluency Whole Words Read, RCS = Reading Composite Score. Pairwise sample sizes = 1,404–1,930. All correlations significant, $p < .0001$.

Table 1.5. Preliminary Incremental Validity of Acadience RAN with Subsequent Reading Composite Score (RCS)

Grade and Time Span	R^2			R^2		
	RCS	RCS + RAN	ΔR^2	LNF	LNF + RAN	ΔR^2
K BOY to EOY	.337	.435	.098	.202	.300	.098
K BOY to MOY	.332	.435	.103	.251	.387	.136
K MOY to EOY	.447	.502	.055	.457	.518	.061
K EOY to BOY G1	.725	.752	.027	.589	.635	.046

Note: Data were exported from Acadience Data Management for the 2018–2019 school year and the beginning of the 2019–2020 school year. RCS = Reading Composite Score, LNF = Letter Naming Fluency, BOY = beginning of year, MOY = middle of year, EOY = end of year, K = kindergarten, G1 = first grade. Sample sizes: beginning to middle = 174, middle to end = 190, end to beginning = 137.

RAN Objects

Materials
1. Assessor Directions and Scoring Form
2. RAN Objects Practice Page and Test Page
3. Timer or stopwatch
4. Pen or pencil

Administration Directions

This measure is individually administered. There is a Practice Page followed by the Test Page. Follow these directions exactly each time with each student. Say the words in bold italic type verbatim. Begin with the Practice Page. The Practice Page is designed to introduce the assessment task to the student and ensure that the items are familiar to the student. They are untimed and include correction procedures. The correction procedures are not used once the timing begins.

▶ *Practice Page:* Put the Practice Page in front of the student and say, ***Te voy a mostrar unas imágenes, cada que yo señale una de las imágenes, tú me dices qué es.*** [Point to the first picture], then say, ***¿Qué es esta imagen?*** If the student is correct, say, ***Muy bien. ¿De qué son las otras imágenes?***

If the student responds correctly to the remaining practice items, no feedback is provided.

For *all* practice items:

Incorrect response Student does not respond within 3 <u>seconds</u> or responds <u>incorrectly</u>	***Esta imagen*** [point] ***es*** [insert name], then say, ***¿Qué es esta imagen?*** [Point to the same picure you just named so the student has another opportunity to name it.]	*Correct response*	***Muy bien.*** If practice items remain say, ***Continúa.***
		Incorrect response	***Esta imagen*** [point] ***es*** [insert name]. If practice items remain say, ***Continúa.***

If the student makes an error on any practice item, provide a second practice trial using the same Practice Page and directions. If the student makes *any* errors on the second practice trial, discontinue the RAN Objects task, mark the discontinued box on the scoring booklet, do not record time or errors, and proceed to RAN Letters.

▶ *Test Page:* Put the Test Page in front of the student and say, ***Aquí hay otras imágenes. Cuando te diga que puedes comenzar, empieza aquí*** [point]***, y continúa por acá*** [sweep your finger left to right under the first two rows of pictures]***, y nombra cada imagen lo más rápido que puedas. No te vayas a saltar ninguna imagen. ¿Listo(a)?, empieza.***

1. Start your stopwatch after you say empieza.
2. During the testing:
   - Follow along as the student responds and put a slash (**/**) though any picture named incorrectly, any picture that is skipped, or any picture not named within 3 seconds.
   - Once the student names the last picture, stop your stopwatch and record the total time (in seconds) on the score sheet.
3. Immediately after testing:
   - Reset the stopwatch for the next measure.
   - Make a note in the scoring booklet about any patterns in student responses.
   - Proceed to RAN Letters.

4. At a later time (shortly after testing but when you are no longer with the student) compute the final score:

- Count up all the errors the student made and write the total errors on the score sheet.
- Record the errors and the time in seconds on the front page of the scoring booklet.

Timing

Continue timing until the student names all pictures or meets the discontinue rule. If the student completes the measure, record the total time in seconds. If the student discontinues, do not record total time.

Wait Rule

If the student does not respond within 3 seconds on a picture, mark a slash (**/**) through the picture, tell the student the name of the picture, point to the next picture and say, ***Continúa.***

Discontinue Rule

If the student makes *any* errors in naming the pictures on the second practice trial, discontinue, mark the discontinued box on the scoring booklet, and do not record time or errors.

If the student makes four errors in the first two rows of the Test Form, discontinue, mark the discontinued box on the scoring booklet, and do not record time or errors.

If the discontinue rule is met, proceed to RAN Letters.

Reminders

If the student says an accurate word that describes the picture but that does not match the name used for the item (e.g., "tenis" for zapato or "micho" for gato), say, ***Llamémoslo(a)*** [insert name of picture], count the item as correct, then point to the next picture (if any remain) and say, ***Continúa.*** For example, if the student says "micho" for gato, say, ***Llamémoslo gato,*** point to the next picture and say, ***Continúa.***

If the student persists in saying an accurate word that describes the picture but does not match the name used for the item, continue to repeat the reminder and count the item as correct. Make a note of this pattern as it may result in the assessment taking additional time and impacting the student's score.

If the student provides an incorrect word for an object, such as "rama" instead of árbol, count the item as incorrect each time this occurs. If this occurs during the practice trial, provide the correction procedure noted in the directions.

If the student skips a line, point to the correct line and say, ***Continúa desde aquí.*** If the student skips an object, mark it as an error. If the student skips around the page, point to the appropriate spot and say, ***Trata de nombrar cada imagen.***

These reminders may be used as often as needed.

RAN Letters

Materials

1. Assessor Directions and Scoring Form
2. RAN Letters Practice Page and Test Page
3. Timer or stopwatch
4. Pen or pencil

Administration Directions

This measure is individually administered. There is a Practice Page followed by the Test Page. Follow these directions exactly each time with each student. Say the words in bold italic type verbatim. Begin with the Practice Page. The Practice Page is designed to introduce the assessment task to the student and ensure that the items are familiar to the student. They are untimed and include correction procedures. The correction procedures are not used once the timing begins.

▶*Practice Page:* Put the Practice Page in front of the student and say, ***Te voy a mostrar unas letras, cada que yo señale una de las letras, tú me dices cuál es.*** [Point to the first letter], then say, ***¿Cuál es esta letra?*** If the student is correct, say, ***Muy bien. ¿Cuáles son las otras letras?***

If the student responds correctly to the remaining practice items, no feedback is provided.
For *all* practice items:

Incorrect response Student does not respond within 3 <u>seconds</u> or responds <u>incorrectly</u>	***Esta letra*** [point] ***es*** [insert name], then say, ***¿Cuál es esta letra?*** [Point to the same letter you just named so the student has another opportunity to name it.]	▶	Correct response	***Muy bien.*** If practice items remain say, ***Continúa.***
		▶	Incorrect response	***Esta letra*** [point] ***es*** [insert name]. If practice items remain say, ***Continúa.***

If the student makes an error on any practice item, provide a second practice trial using the same Practice Page and directions. If the student makes *any* errors on the second practice trial, discontinue the RAN Letters task, mark the discontinued box on the scoring booklet, do not record time or errors, and proceed to RAN Numbers.

▶*Test Page:* Put the Test Page in front of the student and say, ***Aquí hay otras letras. Cuando te diga que puedes comenzar, empieza aquí*** [point]***, y continúa por acá*** [sweep your finger left to right under the first two rows of letters]***, y nombra cada letra lo más rápido que puedas. No te saltes ninguna letra. ¿Listo(a)?, empieza.***

1. Start your stopwatch after you say empieza.
2. During the testing:
   • Follow along as the student responds and put a slash (**/**) though any letter named incorrectly, any letter that is skipped, or any letter not named within 3 seconds.
   • Once the student names the last picture, stop your stopwatch and record the total time (in seconds) on the score sheet.
3. Immediately after testing:
   • Reset the stopwatch for the next measure.
   • Make a note in the scoring booklet about any patterns in student responses.
   • If student met the discontinue rule, proceed to RAN Numbers.

4. At a later time (shortly after testing but when you are no longer with the student) compute the final score:

   • Count up all the errors the student made and write the total errors on the score sheet.

   • Record the errors and the time in seconds on the front page of the scoring booklet.

Timing

Continue timing until the student names all letters or meets the discontinue rule. If the student completes the measure, record the total time in seconds. If the student discontinues, do not record total time.

Wait Rule

If the student does not respond within 3 seconds on a letter, mark a slash (**/**) through the letter, tell the student the name of the letter, point to the next letter and say, ***Continúa.***

Discontinue Rule

If the student makes *any* errors in naming the letters on the second practice trial, discontinue, mark the discontinued box on the scoring booklet, and do not record time or errors.

If the student makes four errors in the first two rows of the Test Form, discontinue, mark the discontinued box on the scoring booklet, and do not record time or errors.

If the discontinue rule is met, proceed to RAN Numbers.

Reminders

If the student skips a line, point to the correct line and say, ***Continúa desde aquí.*** If the student skips a letter, mark it as an error. If the student skips around the page, point to the appropriate spot and say, ***Trata de nombrar cada letra.***

These reminders may be used as often as needed.

RAN Numbers

(Only administered if the student met the discontinue rule on RAN Letters)

Materials

1. Assessor Directions and Scoring Form
2. RAN Numbers Practice Page and Test Page
3. Timer or stopwatch
4. Pen or pencil

Administration Directions

This measure is individually administered. There is a Practice Page followed by the Test Page. Follow these directions exactly each time with each student. Say the words in bold italic type verbatim. Begin with the Practice Page. The Practice Page is designed to introduce the assessment task to the student and ensure that the items are familiar to the student. They are untimed and include correction procedures. The correction procedures are not used once the timing begins.

▶ *Practice Page:* Put the Practice Page in front of the student and say, ***Te voy a mostrar unos números, cada que yo señale uno de los números, tú me dices cuál es.*** [Point to the first number], then say, ***¿Cuál es este número?*** If the student is correct, say, ***Muy bien. ¿Cuáles son los otros números?***

If the student responds correctly to the remaining practice items, no feedback is provided.

For *all* practice items:

Incorrect response Student does not respond within 3 <u>seconds</u> or responds <u>incorrectly</u>	***Este número*** [point] ***es*** [insert name], then say, ***¿Cuál es este número?*** [Point to the same number you just named so the student has another opportunity to name it.]		*Correct response*	***Muy bien.*** If practice items remain say, ***Continúa.***
		▶	*Incorrect response*	***Este número*** [point] ***es*** [insert name]. If practice items remain say, ***Continúa.***

If the student makes an error on any practice item, provide a second practice trial using the same Practice Page and directions. If the student makes *any* errors on the second practice trial, discontinue the RAN Numbers task, mark the discontinued box on the scoring booklet, and do not record time or errors.

▶ *Test Page:* Put the Test Page in front of the student and say, ***Aquí hay otros números. Cuando te diga que puedes comenzar, empieza aquí*** [point]***, y continúa por acá*** [sweep your finger left to right under the first two rows of numbers]***, y nombra cada número lo más rápido que puedas. No te saltes ningún número. ¿Listo(a)?, empieza.***

1. Start your stopwatch after you say empieza.
2. During the testing:
   - Follow along as the student responds and put a slash (**/**) though any number named incorrectly, any number that is skipped, or any number not named within 3 seconds.
   - Once the student names the last number, stop your stopwatch and record the total time (in seconds) on the score sheet.
3. Immediately after testing:
   - Reset the stopwatch for the next measure.
   - Make a note in the scoring booklet about any patterns in student responses.

4. At a later time (shortly after testing but when you are no longer with the student) compute the final score:
   - Count up all the errors the student made and write the total errors on the score sheet.
   - Record the errors and the time in seconds on the front page of the scoring booklet.

Timing

Continue timing until the student names all numbers or meets the discontinue rule. If the student completes the measure, record the total time in seconds. If the student discontinues, do not record total time.

Wait Rule

If the student does not respond within 3 seconds on a number, mark a slash (**/**) through the number, tell the student the name of the number, point to the next number and say, ***Continúa.***

Discontinue Rule

If the student makes *any* errors in naming the numbers on the second practice trial, discontinue, mark the discontinued box on the scoring booklet, and do not record time or errors.

If the student makes four errors in the first two rows of the Test Form, discontinue, mark the discontinued box on the scoring booklet, and do not record time or errors.

Reminders

If the student skips a line, point to the correct line and say, ***Continúa desde aquí.*** If the student skips a number, mark it as an error. If the student skips around the page, point to the appropriate spot and say, ***Trata de nombrar cada número.***

These reminders may be used as often as needed.

Scoring Rules for RAN Objects, RAN Letters, and RAN Numbers

1. Leave blank any items that are named correctly.
2. Mark a slash (**/**) through any item the student names incorrectly, skips, or does not name within 3 seconds.
3. Write "sc" above any item that had been previously slashed and was self-corrected within 3 seconds. Do not count the self-corrected response as an error.

Please Note: Students are not penalized for differences in pronunciation due to dialect, articulation delays or impairments, or speaking a first language other than English.

Approved Accommodations

Approved accommodations are those accommodations that are unlikely to change how the assessment functions. When approved accommodations are used, the scores can be reported and interpreted as official Acadience RAN scores. Approved accommodations should only be used for students for whom the accommodations are necessary to provide an accurate assessment of student skills.

Approved accommodations for RAN include the following:

1. The use of materials that have been enlarged or with larger print for students with visual impairments.
2. The use of colored overlays, filters, or lighting adjustments for students with visual impairments.
3. The use of assistive technology, such as hearing aids and assistive listening devices (ALDs), for students with hearing impairments.
4. The use of a marker or ruler to focus student attention on the materials for students who are not able to demonstrate their skills adequately without one. It is good practice to attempt the assessment first without a marker or ruler and then retest with an alternate form of the assessment using a marker or ruler if needed.

Score Interpretation

A provisional cut score for determining likely need for support will be based on local norms for the time to complete each RAN measure, as well as for the total time (i.e., time to complete RAN Objects and Letters or time to complete RAN Objects and Numbers). With this in mind, educators should plan to test all students in a grade level, except those without response capabilities to complete the assessment, so that the local norms are representative of your student population. To have stable norms, at least 100 students are required. Provisionally, we recommend that students who earn scores at the 10th percentile or lower may need additional support. Scores for students who have more than five errors (less than 90% accuracy) on any RAN measure should not be interpreted as a measure of RAN as one cannot be sure the items were sufficiently familiar to the student. The use of local norms provides an initial interpretive framework. As additional data are gathered on the Acadience RAN measures, these criteria may be updated. Updated guidance on the interpretation of RAN will be posted on the Acadience Learning website (www.acadiencelearning.org). Importantly, RAN measures, while useful for screening students for risk for future reading difficulties, are not well suited for progress monitoring purposes. Additionally, using RAN tasks for teaching purposes is not recommended. According to Kilpatrick (2015), at this time a research-based means to directly improve RAN is not known; however, there is evidence to suggest that meaningful improvement in reading skills is associated with improvements in RAN. Thus, focusing intervention efforts on improving skills that directly impact reading (e.g., phonemic awareness, phonics, decoding, fluency) is recommended.

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Measure: RAN Objects

Grade	Test or Criterion Measure	n	Description of Subjects	Coefficient	Citation/Source
K	Reading (one-minute reading test and picture-word matching test) and Spelling (letter writing and word spelling)	735	Kindergarten-aged children speaking one of four languages: English, Spanish, Czech, or Slovak. Recruited from large cities and surrounding areas in England, Spain, the Czech Republic, and Slovakia. All monolingual speakers of their country's language.	Reading: -.47; Spelling: -.44[1]	Caravolas, M., Lervåg, A., Mousikou, P., Efrim, C., Litavský, M., Onochie-Quintanilla, E., … Hulme, C. (2012). Common patterns of prediction of literacy development in different alphabetic orthographies. *Psychological Science, 23*(6), 678–686. http://doi.org/10.1177/0956797611434536
1	Reading Accuracy and Reading Speed	122	First-grade children (mean age = 6.31 years) attending mainstream schools in Paris. All children came from middle socio-economic backgrounds and were native French speakers. 60 participants were female.	Accuracy: -.31; Speed: .28[2]	Hornung, C., Martin, R., & Fayol, M. (2017). General and specific contributions of ran to reading and arithmetic fluency in first graders: A longitudinal latent variable approach. *Frontiers in Psychology, 8*, 1746. http://doi.org/10.3389/fpsyg.2017.01746
K	PPVT-R, CELF-R, WJ-R, TOWRE	189–384	Kindergarten children who attended regular education programs in one district in the suburb of a large southwestern US city. K–1 subset was 50% male, 54.4% White, 16.8% Black, 15.2% Hispanic, 12.4% Asian, and 1.3% Other. The K–2 subset was 52% male, 54% White, 14.3% Black, 16.4% Hispanic, 14.3% Asian, and 1% Other. Most children were from working or middle-upper class families.	PPVT-R: .26; CELF-R: .24; WJ-R: .37; TOWRE: .54[3]	Schatschneider, C., Fletcher, J., Francis, D., Carlson, C., Foorman, B., & Harris, Karen R. (2004). Kindergarten prediction of reading skills: A longitudinal comparative analysis. *Journal of Educational Psychology, 96*(2), 265–282.
1	Florida Language Profile Letter Knowledge, CTOPP Phonological Awareness (PA) and Phonological Memory (PM), TOWRE Sight Word (SWE) and Phonological Decoding Efficiency (PDE), QRI-II Oral Reading Fluency and Comprehension	103	Kindergarten students attending three schools in a Florida school district. 51% were male, 57% were White, and 39% were Black. 50% received federal lunch assistance.	FLP = .20[4]; CTOPP = .27[5]; TOWRE = .29[6]; QRI-II = .41[7]	Bishop, A.G. (2003). Prediction of first-grade reading achievement: A comparison of fall and winter kindergarten screenings. *Learning Disability Quarterly, 26*, 189–200.
K	PPVT-R, CELF-R, WJ-R, TOWRE	189–384	Kindergarten children who attended regular education programs in one district in the suburb of a large southwestern US city. K–1 subset was 50% male, 54.4% White, 16.8% Black, 15.2% Hispanic, 12.4% Asian, and 1.3% Other. The K–2 subset was 52% male, 54% White, 14.3% Black, 16.4% Hispanic, 14.3% Asian, and 1% Other. Most children were from working or middle-upper class families.	PPVT-R: .26; CELF-R: .24; WJ-R: .37; TOWRE: .54[8]	Schatschneider, C., Fletcher, J., Francis, D., Carlson, C., Foorman, B., & Harris, Karen R. (2004). Kindergarten prediction of reading skills: A longitudinal comparative analysis. *Journal of Educational Psychology, 96*(2), 265–282.

[1] Coefficients are the median between RAN composite score (average naming time for 40 objects/colors across two trials) and (a) Reading composite score (one-minute reading test and picture-word matching test) and (b) Spelling composite score (letter writing and word spelling) from the four participating countries.

[2] Median correlations between Object RAN reaction time and (a) Reading Accuracy (one-minute test, word reading, text reading) and (b) Reading Speed (word reading speed, text reading speed).

[3] Correlations are median values between RAN objects (Denckla & Ruddell 1976) (given at beg. and end of K) and indicated outcome measures (given at end of G1 and G2).

[4] Correlation between RAN objects/colors (given at beg. of K) and Florida Language Profile Letter Knowledge (given at end of K).

[5] Median of correlations between RAN objects/colors (from the CTOPP battery) (given at beg. of K) and CTOPP PA and PM measures (given at mid of K).

[6] Median of correlations between RAN objects/colors (from the CTOPP battery) (given at beg. and mid. of K) and TOWRE SW and PDE measures (given at end of Grade 1).

[7] Median of correlations between RAN objects/colors (from the CTOPP battery) (given at beg. and mid. of K) and QRI-II OR and Comp measures (given at end of Grade 1).

[8] Correlations are median values between RAN objects (Denckla & Ruddell 1976) (given at beg. and end of K) and indicated outcome measures (given at end of G1 and G2).

Measure: RAN Letters

Grade	Test or Criterion Measure	n	Description of Subjects	Coefficient	Citation/Source
1	Woodcock Reading Mastery Test–Revised Form G (WRMT–R, Woodcock, 1987).	383	First-grade children (mean age = 5.8 years) from 33 classrooms in 8 schools in the Nashville metropolitan area. 53.5% were boys. 30% were African American, 48% were Caucasian, and the remaining 22% were primarily Asian or Hispanic. A total of 166 of these 383 children were rated as being at risk for reading difficulties.	.61[9]	Compton, D. L. (2003). The influence of item composition on RAN letter performance in first-grade children. *The Journal of Special Education, 37,* 81–94. https://doi.org/10.1177% 2F00224669030370020301
1	Reading Accuracy and Reading Speed	122	First-grade children (mean age = 6.31 years) attending mainstream schools in Paris. All children came from middle socio-economic backgrounds and were native French speakers. 60 participants were female.	Accuracy: -.43 Speed: .31[10]	Hornung, C., Martin, R., & Fayol, M. (2017). General and specific contributions of ran to reading and arithmetic fluency in first graders: A longitudinal latent variable approach. *Frontiers in Psychology, 8,* 1746. http://doi.org/10.3389/fpsyg.2017.01746
K	Reading accuracy score from the EDA, a standardized French cognitive battery test	33	Kindergarten children (mean age = 5.96) from a mainstream school in Paris. All children came from middle socio-economic backgrounds and were native French speakers.	-.57[11]	Hornung, C., Martin, R., & Fayol, M. (2017). The power of vowels: Contributions of vowel, consonant and digit RAN to clinical approaches in reading development. *Learning and Individual Differences, 57,* 85–102. http://dx.doi.org/10.1016/j. lindif.2017.06.006
1	Reading speed and reading comprehension scores from the EDA, a standardized French cognitive battery test	55	First-grade children (mean age = 6.89) from a mainstream school in Paris. All children came from middle socio-economic backgrounds and were native French speakers.	Speed: .48 Comprehension: -.17[12]	Hornung, C., Martin, R., & Fayol, M. (2017). The power of vowels: Contributions of vowel, consonant and digit RAN to clinical approaches in reading development. *Learning and Individual Differences, 57,* 85–102. http://dx.doi.org/10.1016/j. lindif.2017.06.006
K	PPVT-R, CELF-R, WJ-R, TOWRE	189–384	Kindergarten children who attended regular education programs in one district in the suburb of a large southwestern US city. K–1 subset was 50% male, 54.4% White, 16.8% Black, 15.2% Hispanic, 12.4% Asian, and 1.3% Other. The K–2 subset was 52% male, 54% White, 14.3% Black, 16.4% Hispanic, 14.3% Asian, and 1% Other. Most children were from working or middle-upper class families.	PPVT-R: .28 CELF-R: .28 WJ-R: .47 TOWRE: .65[13]	Schatschneider, C., Fletcher, J., Francis, D., Carlson, C., Foorman, B., & Harris, Karen R. (2004). Kindergarten prediction of reading skills: A longitudinal comparative analysis. *Journal of Educational Psychology, 96*(2), 265–282.
1	Woodcock Reading Mastery Test-R/NU Word Identification (WID) and Passage Comprehension (PC) (WJ-R/ NU), TOWRE Sight Word Reading Efficiency (SWE)	318	First-grade students from 14 schools in urban and suburban Tennessee. 50.6% were female. 44.1% were Black, 41% were White, 6% were Hispanic, 2.4% were Asian, and 6.5% were Other. 42% received free or reduced-price lunch.	WJ-R/NU = -.58[14] TOWRE = -.64[15]	Fuchs, D., Compton, D.L., Fuchs, L.S., Bouton, B., & Caffrey, E. (2011). The construct and predictive validity of a dynamic assessment of young children learning to read: Implications for RTI frameworks. *Journal of Learning Disabilities, 44,* 339–347.

[9]Coefficient is the correlation between Denckla & Rudel (1976) RAN letters task speed score (items named per second) (given in Oct. of Grade 1) and spring WRMT-R (given in Apr. of Grade 1).

[10]Median correlations between Vowel and Consonant RAN (given in Grade 1) and (a) Reading Accuracy (one-minute test, word reading, text reading) and (b) Reading Speed (word reading speed, text reading speed) (both given four months later).

[11]Median of the two correlations between Vowel and Consonant RAN (administered in kindergarten) and Reading Accuracy score (administered in Grade 1).

[12]Median correlations between Vowel and Consonant RAN (administered in Grade 1) and (a) Reading Speed score (both administered in Grade 2).

[13]Correlations are median values between RAN letters (Denckla & Ruddell 1976) (given at beg. and end of K) and indicated outcome measures (given at end of G1 and G2).

[14]Median of the correlations between RAN letters (from the CTOPP battery) (administered beg. of K) and WJ-R/NU WID and PC (administered spring of Grade 1).

[15]Correlation between RAN letters (from the CTOPP battery) (administered beg. of K) and TOWRE SWE (administered spring of Grade 1).

Measure: RAN Numbers

Grade	Test or Criterion Measure	n	Description of Subjects	Coefficient	Citation/Source
K	Reading accuracy score from the EDA, a standardized French cognitive battery test	33	Kindergarten children (mean age = 5.96) from a mainstream school in Paris. All children came from middle socio-economic backgrounds and were native French speakers.	-.53[16]	Hornung, C., Martin, R., & Fayol, M. (2017). The power of vowels: Contributions of vowel, consonant and digit RAN to clinical approaches in reading development. *Learning and Individual Differences, 57,* 85–102. http://dx.doi.org/10.1016/j.lindif.2017.06.006
1	Reading speed and reading comprehension scores from the EDA, a standardized French cognitive battery test	55	First-grade children (mean age = 6.89) from a mainstream school in Paris. All children came from middle socio-economic backgrounds and were native French speakers.	Speed: .59 Comprehension: -.19[17]	Hornung, C., Martin, R., & Fayol, M. (2017). The power of vowels: Contributions of vowel, consonant and digit RAN to clinical approaches in reading development. *Learning and Individual Differences, 57,* 85–102. http://dx.doi.org/10.1016/j.lindif.2017.06.006
1	Reading Accuracy and Reading Speed	122	First-grade children (mean age = 6.31 years) attending mainstream schools in Paris. All children came from middle socio-economic backgrounds and were native French speakers. 60 participants were female.	Accuracy: -.35 Speed: .41[18]	Hornung, C., Martin, R., & Fayol, M. (2017). General and specific contributions of RAN to reading and arithmetic fluency in first graders: A longitudinal latent variable approach. *Frontiers In Psychology, 8,* 1746. http://doi.org/10.3389/fpsyg.2017.01746
1	Woodcock Reading Mastery Test-R/NU Word Identification (WID) and Passage Comprehension (PC) (WJ-R/NU), TOWRE Sight Word Reading Efficiency (SWE)	318	First-grade students from 14 schools in urban and suburban Tennessee. 50.6% were female, 44.1% were Black, 41% were White, 6% were Hispanic, 2.4% were Asian, and 6.5% were Other. 42% received free or reduced-price lunch.	WJ-R/NU = -.52[19] TOWRE = -.61[20]	Fuchs, D., Compton, D.L., Fuchs, L.S., Bouton, B., & Caffrey, E. (2011). The construct and predictive validity of a dynamic assessment of young children learning to read: Implications for RTI frameworks. *Journal of Learning Disabilities, 44,* 339–347.
1	Woodcock Reading Mastery Test-R/NU Word Identification (WID) and Word Attack (WAT) (WJ-R/NU), Test of Word Reading Efficiency Sight Word Reading Efficiency (SWE) and Phonemic Decoding Efficiency (PDE) (TOWRE)	105	First-grade students with a wide range of reading skills and whose first language is English. 55% were male, 37% were Black, 50% were White, 12% were Other. 51% received free/reduced lunch and 10% were on an IEP.	WJ-R/NU = .39[21] TOWRE = .48[22]	Cho, E., Compton, D., Gilbert, J., Steacy, L., Collins, A., & Lindström, E. (2017). Development of first-graders' word reading skills: For whom can dynamic assessment tell us more? *Journal of Learning Disabilities, 50,* 95–112. doi: 10.1177/0022219415599343

[16]Correlation between Digit RAN (administered in kindergarten) and Reading Accuracy score (administered in Grade 1).

[17]Correlations between Digit RAN (administered in Grade 1) and (a) Reading Speed score and (b) Reading Comprehension score (both administered in Grade 2).

[18]Median correlations between Digit RAN reaction time (given in Grade 1) and (a) Reading Accuracy (one-minute test, word reading, text reading) and (b) Reading Speed (word reading speed, text reading speed) (both given four months later).

[19]Median of the correlations between RAN digits (from the CTOPP battery) (administered beg. of K) and WJ-R/NU WID and PC (administered spring of Grade 1).

[20]Correlation between RAN digits (from the CTOPP battery) (administered beg. of K) and TOWRE SWE (administered spring of Grade 1).

[21]Median of correlations between RAN digits (from the CTOPP battery) words per second (administered at beg. of Grade 1) and WJ-R/NU WID and WAT (administered end of Grade 1).

[22]Median of correlations between RAN digits (from the CTOPP battery) words per second (administered at beg. of Grade 1) and TOWRE SWE and PDE (administered end of Grade 1).