NEPS
National Educational Panel Study

Research Data

The Assessment of Reading Speed in Adults and First-Year Students

Stefan Zimmermann, Cordula Artelt, and Sabine Weinert

LIfBi
LEIBNIZ INSTITUTE FOR
EDUCATIONAL TRAJECTORIES

Leibniz Institute for Educational Trajectories (LIfBi)
Wilhelmsplatz 3, 96047 Bamberg
Director: Prof. Dr. Hans-Günther Roßbach
Executive Director of Research: Dr. Jutta von Maurice
Executive Director of Administration: Dr. Robert Polgar
Bamberg, 2014

The Assessment of Reading Speed in Adults and First-Year Students

Stefan Zimmermann, Cordula Artelt, & Sabine Weinert

Within the National Educational Panel Study (NEPS) different competencies are measured coherently across the life span. These include, among other domains, language competencies in the lingua franca of the society (reading competence, listening comprehension), mathematical literacy, and natural science literacy. In addition, nonverbal indicators of general cognitive functioning are assessed. Weinert, Artelt, Prenzel, Senkbeil, Ehmke, and Carstensen (2011) and Artelt, Weinert, and Carstensen (2013) give an overview of the study design and the competence domains measured in the NEPS. Additionally to the assessment of reading competence which refers to the comprehension of written texts (Gehrer, Zimmermann, Artelt, & Weinert, 2013; Gehrer, Zimmermann, Artelt, & Weinert, 2012 for sample items and a brief description), a test of reading speed in the lingua franca of the society is administered at least once in almost every NEPS starting cohort. This instrument is described in the following.

I. Assessment of reading speed in the NEPS

The indicator of the reading speed primarily captures basic reading processes such as decoding and, thus, focusses on automatized reading processes. A low degree of automation in decoding processes and other basic processes in reading (e.g., lexical access, basic sentence processing based on written material) will hinder the comprehension process, especially in novice readers (Rosebrock & Nix, 2006). Yet even in older age groups, interindividual differences in reading speed do exist. It is therefore not surprising that decoding skills still predict differences in reading comprehension in grade 9 (Artelt, Stanat, Schneider, & Schiefele, 2001).

The test which is used in the NEPS is based on the test principles of the Salzburg reading screening SLS (e.g. Auer, Gruber, Mayringer, & Wimmer, 2005). As is the case with SLS, the NEPS reading speed test consists of a number of short sentences that have to be rated as either true or false by the participants (e.g. “There is a bath tub in every garage”). Given that the test aims at the assessment of automatized reading processes, the sentences to be evaluated draw on common world knowledge only. At the end of the construction process (which, among other things, also included expert ratings on the difficulty of the sentences), 51 sentences were selected for the final reading speed test (see figure 1 for the instruction and two example sentences). In the test booklet, the items were presented in order of sentence length, with sentences ranging from 5 to 18 words. The 51 items version of the test was used for age cohort 3 (fifth grade), age cohort 4 (ninth grade), cohort 5 (first-year students), and cohort 6 (adults).

Table 1: Overview of the measurement points and assessments of reading speed in cohort 5 (SC 5) and cohort 6 (SC 6).

cohort	year	wave	study	measurement point of reading speed
SC 5: first-year students	2011	1	B53	X
SC 6: adults	2009	1	B72	
	2010	2	B67	X
	2011	3	B68	
	2012	4	B69	X*

Note: * Reading speed was only assessed for participants who supplement the sample in wave 4.

The 51 sentences were administered as a speed test with a test time of exactly 2min. The test primarily intends to capture individual differences in the lower performance range of each age group. As the time limit remains the same in each age group, the performance is cross-sectionally comparable but in later age groups, ceiling effects occur as data from adults (figure 2) and first-year students (figure 3) show. For descriptive results on reading speed in cohort 3 (fifth grade) and 4 (ninth grade) see Zimmermann, Gehrer, Artelt, & Weinert (2012).

Instruction

On the following pages, several sentences are shown. The content of the sentences is not always right. It is your task to decide if they are right or wrong. Some of the sentences you will probably regard as silly or easy to solve. Your promptness is of more importance than your knowledge.
On this page, two example sentences are given, so that you can familiarize yourself with the task. Turn over the page when you get a sign from the test supervisor.

	right	wrong
There is a bath tub in every garage.	a	a
The person who ensures fair play in a sports match is called referee.	a	a

Instruktion

Auf den nächsten Seiten findest du eine Reihe von Sätzen. Der Inhalt der Sätze stimmt aber nicht immer. Deine Aufgabe ist es, bei jedem Satz durch Ankreuzen zu markieren, ob er wahr oder falsch ist. Die Sätze kommen dir vielleicht recht leicht, teilweise auch lustig vor. Es geht bei diesen Sätzen eher um Schnelligkeit und weniger um dein Wissen. Auf dieser Seite findest du zwei Beispielsätze, so dass du dich mit den Aufgaben vertraut machen kannst. Blättere erst weiter auf die nächste Seite, wenn du ein Zeichen vom Testleiter erhält!

	richtig	falsch
In einer Garage findet man immer eine Badewanne.	a	a
Die Person, die bei einem Fußballspiel auf die Einhaltung der Regeln achtet, nennt man Schiedsrichter.	a	a

Figure 1: Instruction Examples of two reading speed items (in English and German).

II. Reading speed in the adult cohort (SC 6: Wave 2, 2010; Wave 4, 2012)

The description of the sample as well as information on the implementation can be found in the data manual (Skopek, 2012). A description of the design of the study and the competence measures deployed in the main survey can be found in the information provided on competence assessment in the NEPS (NEPS, 2011a). In the Following, the descriptive statistics are presented for wave 2 (2010) and wave 4 (2012). For each individual, reading speed was only assessed once; thus in wave 4 only participants of the supplement sample took the reading speed test.

For 7246[1] individuals who took part in wave 2 of the main study in 2010, a sum score has been calculated. In wave 4, a sum score is available for 3206 individuals. Thus, the SUF SC6 (Version 4-0-0) contains reading speed data for 10452 individuals. The items are numbered in the order of their administration (1-51). Missing values are coded as -55 (not determinable), -94 (not reached), -95 (not valid), and -97 (omitted). An example of the variable code: rsci0001_c (= rs: reading speed, ci: cohort invariant; 0001: item 1; _c: scored). The sum of scores (e.g. rsa2_sc3, = a: adults; 2: wave 2; sc: scored; 3: sum score) is obtained by the number of sentences correctly judged during the 2-min processing limit. Table 1 displays descriptive statistics of the sum scores.

As intended the amount of participants with falsely judged sentences can be neglected. On average the participants misjudged 0.48 sentences, indicating that the sentences were easy to be judged, which confirms the assumption that differences in individual test scores can primarily be attributed to differences in reading speed.

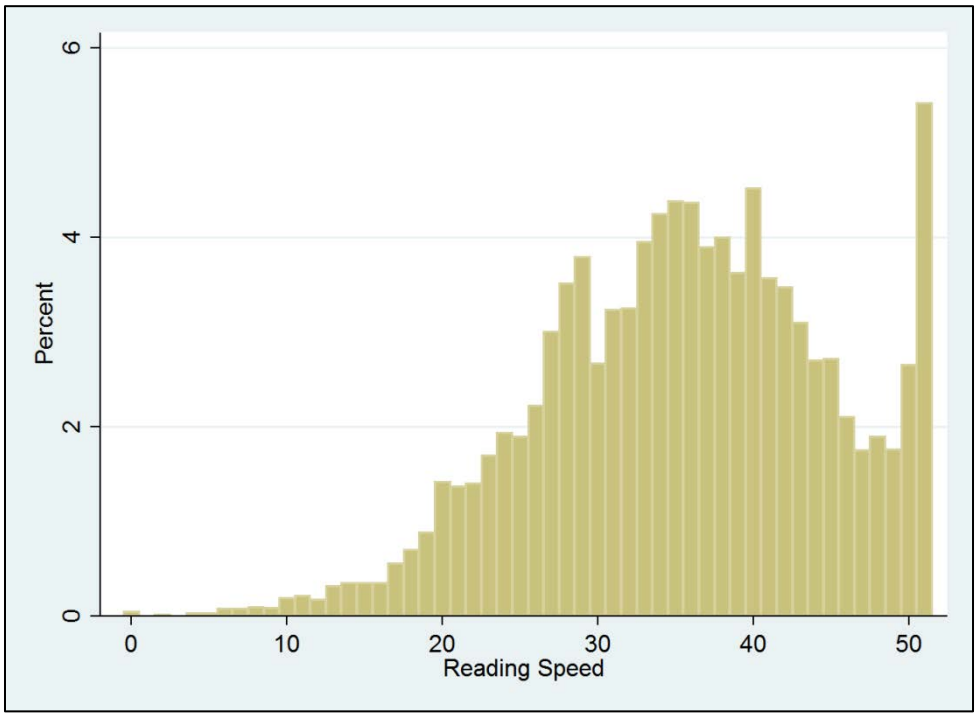
Table 2: Descriptive statistics for the sum scores of reading speed in starting cohort 6 (adults).

	Wave 2 (B67)	**Wave 4 (B69)***	**Total**
Mean	35.97	34.58	35.54
Median	36.00	35.00	36.00
Standard Deviation	9.29	9.10	9.25
Minimum	0	4	0
Maximum	51	51	51
Variable	rsa2_sc3	rsa4_sc3	

Note: * Reading speed was only assessed for participants who supplement the sample in wave 4.

[1] Note that this number corresponds to the SUF SC6 (Version 3-0-1; doi:10.5157/NEPS:SC6:3.0.1).

Figure 2: Distribution of reading speed performance in starting cohort 6 (Adults) in B67 and B69.



The distribution of reading speed shows that there is ceiling effect for adults (see Figure 2), as 5.42% of the participants rated all sentences correctly within the 2min time-limit.

III. Reading speed in first-year students (SC 5: Wave 1)

The description of the sample as well as information on the implementation can be found in the data manual of the starting cohort SC5 (in preparation). A description of the design of the study and the competence measures deployed in the main survey can be found in the information provided on competence assessment in NEPS (NEPS, 2011a).

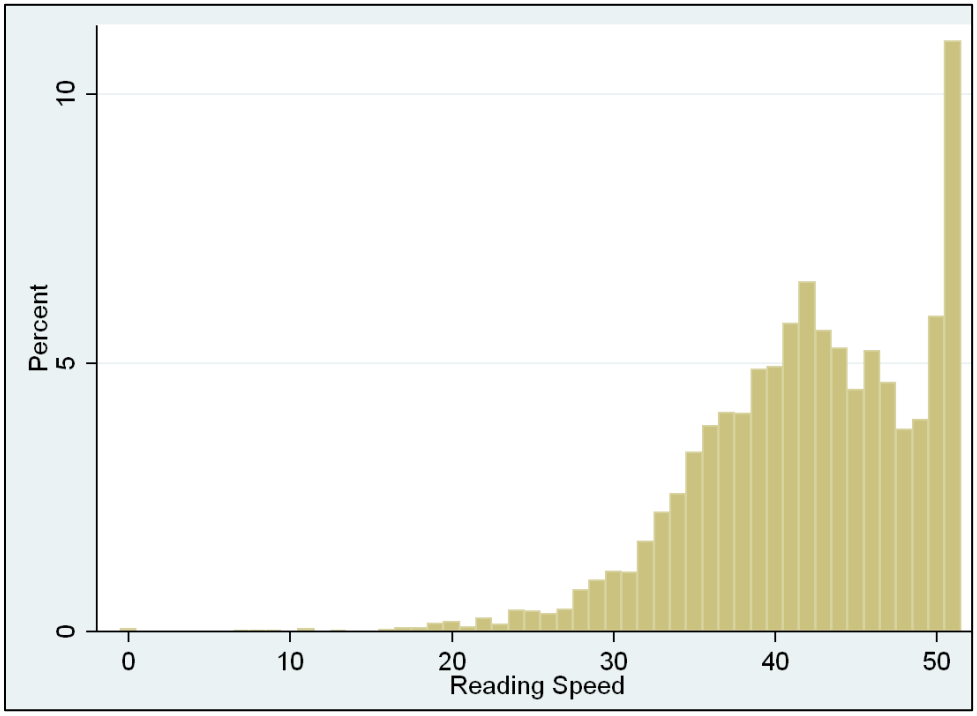
For 5951[2] individuals, a sum score has been calculated. The items are numbered in the order of their administration (1-51). Missing values are coded as -55 (not determinable), -94 (not reached), -95 (not valid), and -97 (omitted). An example of the variable code: rsci0001_c (= rs: reading speed, ci: cohort invariant; 0001: item 1; _c: scored). The sum of scores (rss1_sc3, = s: first-year students; 1: wave 1; sc: scored; 3: sum score) is obtained by the number of sentences correctly judged during the 2-min processing limit. Table 2 displays descriptive statistics of the sum scores.

[2] Note that this number corresponds to the SUF SC5 (Version 3-0-0; doi:10.5157/NEPS:SC5:3.0.0).

Table 3: Descriptive statistics for the sum scores of reading speed in starting cohort 5 (first-year students).

	Wave 1 (B53)
Mean	42.01
Median	42.00
Standard Deviation	6.75
Minimum	0
Maximum	51
Variable	rss1_sc3

Figure 3: Distribution of reading speed performance in starting cohort 5 (first-year students) in B53.



The distribution of reading speed shows that there is a considerable ceiling effect in first-year students (see Figure 3), as 10.99% of the participants rated all sentences correctly within the 2 min time-limit.

As intended the amount of participants with falsely judged sentences can be neglected. On average the participants misjudged 0.43 sentences, indicating that the sentences were easy

to be judged, which confirms the assumption that differences in individual test scores can primarily be attributed to differences in reading speed.

IV. References

Data manual. Starting cohort 5 (First-Year Students): SUF-Version 3.0.0. (in preparation) NEPS Research Data Paper, University of Bamberg.

Artelt, C., Weinert, S. & Carstensen, C. H. (2013). Assessing competencies across the lifespan within the German National Educational Panel Study (NEPS) – Editorial, *Journal of Educational Research Online, 5(2)*, 5-14.

Artelt, C., Stanat, P., Schneider, W., & Schiefele, U. (2001). Lesekompetenz: Testkonzeption und Ergebnisse Lesekompetenz: Testkonzeption und Ergebnisse In J. Baumert, E. Klieme, M. Neubrand, M. Prenzel, U. Schiefele, W. Schneider, P. Stanat, K.-J. Tillmann & M. Weiß (Eds.), *PISA 2000: Basiskompetenzen von Schülerinnen und Schülern im internationalen Vergleich,* Leske + Budrich, 69-137.

Auer, M., Gruber, G., Mayringer, H., & Wimmer, H. (2005). Salzburger Lesescreening für die Klassenstufen 5-8. Göttingen: Hogrefe.

Gehrer, K., Zimmermann. S., Artelt, C., & Weinert, S. (2013). NEPS framework for assessing reading competence and results from an adult pilot study, *Journal of Educational Research Online, 5(2)*, 50-79.

Gehrer, K., Zimmermann. S., Artelt, C., & Weinert, S. (2012). *The Assessment of Reading Competence (including sample items from grade 5 and grade 9)*. Scientific Use File 2012, Version 1.0.0. Bamberg: Otto-Friedrich-Universität, Nationales Bildungspanel.

NEPS (2011a). Starting Cohort 6. Main Study 2010/11 (B67). Information on the Competence Test. URL: https://www.neps-data.de/Portals/0/NEPS/Datenzentrum/Forschungsdaten /SC6/3-0-0/C_B67_EN.pdf, [10.10.2012].

NEPS (2011b). Starting Cohort 5. Main Study 2010/11 (B53) Information on the Competence Test. URL: https://www.neps-data.de/Portals/0/NEPS/Datenzentrum/Forschungsdaten /SC5/3-0-0/C_B53_EN.pdf, [10.10.2013].

Rosebrock, C. & Nix, D. (2006). Forschungsüberblick: Leseflüssigkeit (Fluency) in der amerikanischen Leseforschung und –didaktik, *Didaktik Deutsch*, *20*, 90-112.

Skopek, J. (2012). *Data manual. Starting cohort 6 (Adults): SUF-Version 3.0.1.*, NEPS Research Data Paper, University of Bamberg.

Weinert, S., Artelt, C., Prenzel, M., Senkbeil, M., Ehmke, T., & Carstensen, C.H. (2011). Development of competencies across the life span. In H. P. Blossfeld, H. G. Roßbach & J. v. Maurice & (Eds.), *Education as a lifelong process: The German National Educational Panel Study (NEPS)*,Zeitschrift für Erziehungswissenschaft, Sonderheft 14. Wiesbaden: VS Verlag für Sozialwissenschaften.

Zimmermann, S., Gehrer, K., Artelt, C., & Weinert (2012). *Reading Speed in Grade Five and Grade Nine.* Bamberg: Otto-Friedrich-Universität, Nationales Bildungspanel.