

SUPPLEMENTARY MATERIAL A – Additional tasks

Lists of words for YARC

List 1: see, look, play, was, like, this, next, house, going, bell

List 2: hang, stand, their, living, again, first, slowly, score, found, bread

List 3: scream, journey, suppose, yawned, should, tissue, caught, stretching, tongue, copies

List 4: medicine, strengthen, source, creative, material, eventually, hygiene, despite, calm, journalism

List 5: excitable, dehydration, persuade, aggrieved, originate, courageous, atmospheric, familiarise, scenic, recurrence

List 6: ferocious, cynical, excursion, coincidental, abysmal, endeavour, rheumatism, haemorrhage, liaison, pseudonym

List 7: lacerate, bureaucracy, endogenous, coerce, archaic, facetious, pharmaceutical, ochre, fruition, paediatrician

Words for spelling test

Obtain, vouchers, parallel, feasible, pursue, disseminate, caution, ninetieth, accommodate, definite, thoroughly, sincerely, vengeance, breathe, leopard, physicist, weird, hypochondriac, fluorescent, slaughter.

Words for BPVS 3

Greeting, antlers, orbit, collision, inflated, applauded, nutritious, adjustable, scalp, reptile, resuscitation, links, arctic, glider, lecturing, engraving, cooperation, fictional, hoisting, isolation, syringe, composing, fern, weary, parallel, dilapidated, departing, easel, embracing, utensil, quartet, citrus, digit, feline, pillar, timer, summit, salutation, agricultural, geriatric, talon, consuming, dwelling, emaciated, lubricating, descending, spherical, exterior, trestle, perforated, cascade, vagrant, trajectory, inoculating, arable, beacon, deciduous, submerging, physician, attire, converging, receptacle, festoon, incarcerating, incline, encumbered, caster, equestrian, convex, culinary.

Words for elision test

Item	Nonword	Sound to remove	Item	Nonword	Sound to remove
1	/'li.ɔɡs/	/l/	10	/'æb.sʌmpt/	/m/
2	/θaʊk/	/θ/	11	/klɔ:sp/	/s/
3	/'zæblət/	/z/	12	/dʒɪlk/	/l/
4	/twɛln/	/w/	13	/'fi:knə/	/n/
5	/'splɔɪtəl/	/p/	14	/'bi:ltrʌm/	/t/
6	/'skreɪpɒs/	/p/	15	/'læn.spʌŋ/	/s/
7	/'plai.təf/	/f/	16	/'pɪlp.sɔɪ/	/l/
8	/'ja'lu:m/	/m/	17	/'rɛmp.slʌf/	/m/
9	/'træs.dʒɔɪb/	/s/	18	/'wɔɪft.nʌp/	/t/

Words for non-word repetition test

1	/tʃʌz/	9	/'rɛ.frum.tai/	17	/'dʒɑ:.bɛ.,rɛm jə plʌv.zə/
2	/vɜrd/	10	/wɪ.kə'vu:n/	18	/dʒaɪ.'kɛn.tju.əl.vɪk.ləm/

3	/slaop/	11	'taɪ.ðə.spə.zɪk	19	/'vɒk.təl.rɔɪ.wən.ɔɪ.sə.sæb/
4	/'θrɑ:n.tɪb/	12	/'kɒ.dʒɪ'ti:θəl/	20	/fən.'stu:.sɪb.lɪk.wəl.li.tɪz/
5	/'weɪ.klɒft/	13	/'faɪ'wɔ:k.pə.tʃeɪz/	21	/'paʊ.fə'skri:p.sə.stri:k.mɪl.ti.əs/
6	/'dʒɪj.prɔɪz/	14	/'ret.kɪp.taʊ.vʊm.təm/	22	/'sɪl.væg.'su:fjə.wæ.spə.nə.tri.tɪm/
7	/sploɪ.'tɛl/	15	/fə'ti:sɑ.bʌnəl/		
8	/kɪf.'geɪ.brʌm/	16	/'mæn.laʊ'si:.oʊ.frʌpt/		

Sentences for morphosyntactic test

- 1 *After the party didn't love the people said.
- 2 *He played yesterday football the field in.
- 3 *Our holiday will at home we spend next year.
- 4 *To the cinema we not want do to go tonight.
- 5 She will not go to the show tomorrow night.
- 6 Our trip to France has been cancelled due to exams.
- 7 Everyone who attended the party said they had fun.
- 8 Michael is not going to enjoy the symphony this evening.
- 9 *Yesterday drank the doctor an expensive wine.
- 10 *Tomorrow will the students run the long race.
- 11 *In the afternoon went the class to the park.
- 12 *When watching the show laughed the audience loudly.
- 13 Every day the students go to school on time.
- 14 At night the custodians clean up all the empty classrooms.
- 15 In two weeks the students will go on a class trip.
- 16 Last year Mary took her sister to Disneyland.
- 17 *The girl with all the heavy bags drink coffee.
- 18 *The man wearing black shoes walk to the train station.
- 19 *The collection of documents from the revolution were stolen.
- 20 *The picture on the labels were too dark.
- 21 Mary's cat likes to chase mice in the garden.
- 22 The teacher patiently tells the students to be quiet.

- 23 Some of the sugar is on the floor under the table.
- 24 The actors in the play were learning the script.
- 25 *The girls waiting for the late bus looks for their ticket.
- 26 *The children with the toy shovel plays in the sandbox.
- 27 *Mary and Pat goes to the deli every morning to buy coffee.
- 28 *The causes of the illness is poor diet and lack of exercise.
- 29 A pencil and eraser make writing easier for children.
- 30 The tables in the display window look expensive.
- 31 Mary's relatives arrive today from the north of England.
- 32 The members of the jury have come to a unanimous verdict.

SUPPLEMENTARY MATERIAL B – Details of statistical models

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1. OMNIBUS

1.1 Target

1.1.1 First pass dwell time

RANDOM EFFECT STRUCTURE REDUCTION

Data: log10 transformed

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap* Length slope	Intercept + Relatedness*Overlap * Length slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Length * Reading skills +	Intercept + Relatedness*Overlap * Length slope	Intercept + Relatedness, Overlap & Length slopes	Singular fit.					

	Relatedness * Overlap * Length * Phonological skills					
Full_Reduced2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap + Length slope	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Length & Overlap slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Overlap*Length slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced6	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		

	* Phonological skills					
Full_Reduced7	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness & Length slopes	Singular fit.		
Full_Reduced8	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Overlap & Length slopes	Singular fit.		
Full_Reduced9	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced10	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced11	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length	Intercept + Relatedness, Overlap & Length slopes	Intercept + Length slope	Singular fit.		

	* Phonological skills					
Full_Reduced_P1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept	Singular fit.		
Full_Reduced_P2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Length slopes	Intercept	Singular fit.		
Full_Reduced_P4	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Overlap & Length slopes	Intercept	Singular fit.		
Full_Reduced_P5	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness slope	Intercept	Singular fit.		

Full_Reduced_P6	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Overlap slope	Intercept	Singular fit.		
Full_Reduced_P7	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Length slope	Intercept	Singular fit.		
Full_Reduced_I1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept	Intercept + Relatedness slope	Converges.		
Full_Reduced_I2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept	Intercept + Overlap slope	Converges.		
Full_Reduced_I3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept	Intercept + Length slope	Converges.		

Full_Reduced_I4	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept	Intercept + Relatedness & Overlap slopes	Does not converge.					
Full_Reduced_I5	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept	Intercept + Relatedness & Length slopes	Singular.					
Full_Reduced_I6	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept	Intercept + Overlap & Length slopes	Does not converge.					
<i>We compare models Full_Reduced_I1, Full_Reduced_I2, and Full_Reduced_I3</i>				AIC	BIC	LL	npar	Df	X ²
Full_Reduced_I1	<i>See above</i>	Intercept	Intercept + Relatedness slope	-3289	-3098	1673	29		
Full_Reduced_I2	<i>See above</i>	Intercept	Intercept + Overlap slope	-3289	-3098	1673	29	0	0
Full_Reduced_I3	<i>See above</i>	Intercept	Intercept + Length slope	-3290	-3099	1674	0	0	0.95

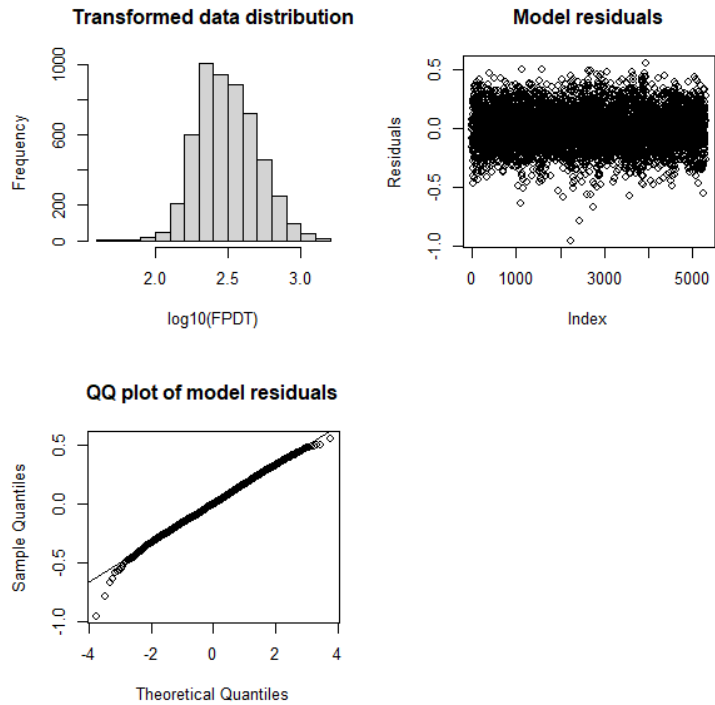
Final random-effects structure selected: (1|Participants) + (Relatedness|Item)

FIXED-EFFECTS STRUCTURE REDUCTION with drop 1 (removing non-significant higher order interactions in descending order).

Model reduction					
	Sum Sq	df	Density df	F	<i>p</i>

scale(Reading skills):Relatedness:Overlap:Length	0.13	1	5031	4.51	.034 *
scale(Phonological skills):Relatedness:Overlap:Length	0.065	1	2038	2.27	.13
New model: $\log_{10}(\text{FPDT}) \sim \text{scale}(\text{Reading skills}) * \text{Relatedness} * \text{Overlap} * \text{Length} + (\text{scale}(\text{Phonological skills}) + \text{Relatedness} + \text{Overlap} + \text{Length})^3 \text{ RE}$					
Relatedness:Overlap:Phonological skills	0.001	1	5038	0.041	.84
Relatedness:Length:Phonological skills	0.001	1	5038	0.042	.84
Overlap:Length: Phonological skills	0.008	1	5093	0.29	.59
New model: $\log_{10}(\text{FPDT}) \sim \text{scale}(\text{Reading skills}) * \text{Relatedness} * \text{Overlap} * \text{Length} + (\text{scale}(\text{Phonological skills}) + \text{Relatedness} + \text{Overlap} + \text{Length})^2 + \text{RE}$					
Phonological skills:Relatedness	0.007	1	5038	0.24	.63
Phonological skills:Overlap	0.001	1	5093	0.02	.88
Phonological skills:Length	0.004	1	5093	0.14	.71
New model: $\log_{10}(\text{FPDT}) \sim \text{scale}(\text{Reading skills}) * \text{Relatedness} * \text{Overlap} * \text{Length} + \text{scale}(\text{Phonological skills}) + \text{RE}$					
Phonological skills	0.020	1	47	0.69	.41

Final model selected: $\log_{10}(\text{FPDT}) \sim \text{scale}(\text{Reading skills}) * \text{Relatedness} * \text{Overlap} * \text{Length} + (1|\text{Participant}) + (\text{Relatedness}|\text{Item})$



Model summary (p values from model comparison)

Fixed Effects						
	Est/Beta	SE	95% CI	df	t	Significance
Intercept	2.486	0.013	[2.461; 2.511]	71	192.91	<.0001
Reading skills (scaled)	-0.051	0.011	[-0.073; -0.029]	47	-4.49	$\chi^2(1) = 16.82, p < .001$ ***
Relatedness	0.003	0.005	[-0.007; 0.012]	123	0.55	$\chi^2(1) = 0.22, p = .64$
Overlap	-0.004	0.012	[-0.028; 0.02]	127	-0.32	$\chi^2(1) = 0.11, p = .74$
Length	0.049	0.012	[0.025; 0.073]	127	3.94	$\chi^2(1) = 13.96, p < .001$ ***
Reading skills: Relatedness	0.003	0.005	[-0.006; 0.012]	5039	0.64	$\chi^2(1) = 0.37, p = .54$
Reading skills: Overlap	-0.007	0.005	[-0.016; 0.002]	5058	-1.54	$\chi^2(1) = 2.36, p = .12$
Relatedness: Overlap	-0.017	0.010	[-0.036; 0.001]	123	-1.81	$\chi^2(1) = 3.27, p = .070$.

Reading skills: Length	0.002	0.005	[-0.007; 0.011]	5055	0.36	$\chi^2(1) = 0.17, p = .68$
Relatedness: Length	-0.006	0.010	[-0.024; 0.013]	123	-0.60	$\chi^2(1) = 0.34, p = .56$
Overlap: Length	-0.062	0.025	[-0.111; -0.013]	127	-2.48	$\chi^2(1) = 6.17, p = .013^*$
Reading skills: Relatedness: Overlap	-0.001	0.009	[-0.019; 0.017]	5040	-0.12	$\chi^2(1) = 0.018, p = .89$
Reading skills: Relatedness: Length	-0.019	0.009	[-0.037; -0.001]	5039	-2.03	$\chi^2(1) = 3.94, p = .047^*$
Reading skills: Overlap: Length	0.017	0.009	[-0.001; 0.035]	5058	1.82	$\chi^2(1) = 3.26, p = .071$
Relatedness: Overlap: Length	-0.021	0.019	[-0.059; 0.016]	123	-1.12	$\chi^2(1) = 1.27, p = .26$
Reading skills: Relatedness: Overlap: Length	0.030	0.019	[-0.007; 0.066]	5041	1.60	$\chi^2(1) = 2.57, p = .11$
Random Effects						
	Variance	S.D.		Correlation		
Item (Intercept)	0.004	0.065				
Relatedness (Item)	0.000	0.012		-0.16		
Participant (Intercept)	0.006	0.078				
Residual	0.029	0.17				
Model fit						
R ²	Marginal		Conditional			
	0.083		0.33			
Key: p-values for fixed effects calculated using Satterthwaite's approximations.						
Confidence Intervals have been calculated using the Wald method.						
Nb observations: 5300; Nb of participants: 48; Nb of items: 128						

1.1.2 Dwell time

RANDOM EFFECT STRUCTURE REDUCTION

Data: log10 transformed

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Length * Reading skills +	Intercept + Relatedness*Overlap* Length slope	Intercept + Relatedness*Overlap * Length slope	Singular fit.					

	Relatedness * Overlap * Length * Phonological skills					
Full_Reduced1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap * Length slope	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap + Length slope	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Length & Overlap slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Overlap*Length slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		

	* Phonological skills					
Full_Reduced6	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		
Full_Reduced7	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness & Length slopes	Singular fit.		
Full_Reduced8	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Overlap & Length slopes	Singular fit.		
Full_Reduced9	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced10	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Overlap slope	Singular fit.		

Full_Reduced11	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Length slope	Singular fit.		
Full_Reduced_P1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept	Singular fit.		
Full_Reduced_P2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Length slopes	Intercept	Converges.		
Full_Reduced_P4	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Overlap & Length slopes	Intercept	Singular fit.		

Full_Reduced_I1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Length slopes	Intercept + Relatedness slope	Converges.		
Full_Reduced_I2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Length slopes	Intercept + Overlap slope	Singular.		
Full_Reduced_I3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Length slopes	Intercept + Length slope	Converges.		
Full_Reduced_I4	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept	Intercept + Relatedness & Overlap slopes	Does not converge.		

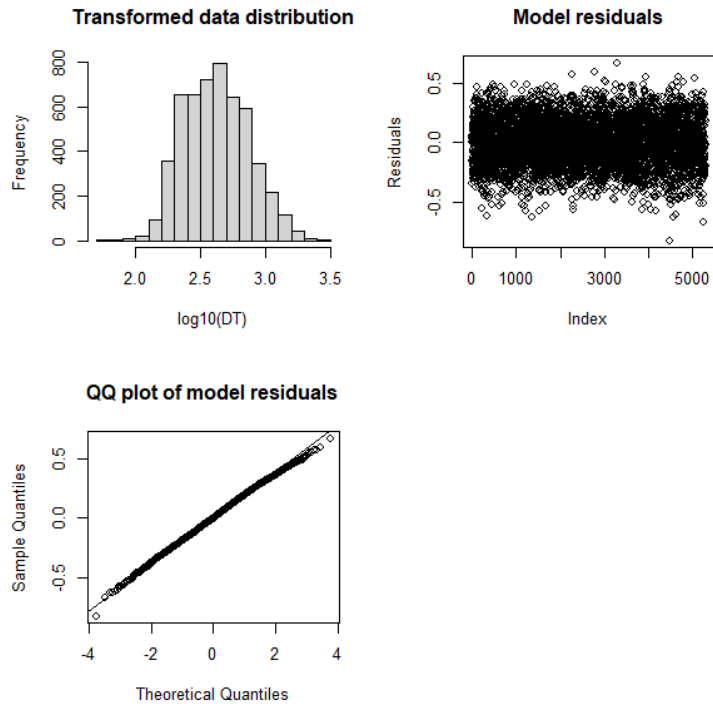
Final random-effects structure selected: (Relatedness+Length|Participants) + (Relatedness|Item)

FIXED-EFFECTS STRUCTURE REDUCTION with drop 1 (removing non-significant higher order interactions in descending order).

Model reduction					
	Sum Sq	df	Density df	F	<i>p</i>
scale(Reading skills):Relatedness:Overlap:Length	0.072	1	4953	1.96	.16

scale(Phonological skills):Relatedness:Overlap:Length	0.0003	1	4954	0.011	.92
New model: $\log_{10}(\text{FPDT}) \sim (\text{scale}(\text{Reading skills})+\text{Relatedness}+\text{Overlap}+\text{Length})^3 + (\text{scale}(\text{Phonological skills})+\text{Relatedness}+\text{Overlap}+\text{Length})^3 + \text{RE}$					
<i>Singular – remove Relatedness from Item random effects</i>					
Reading skills:Relatedness:Overlap	0.004	1	5050	0.100	.75
Reading skills:Relatedness:Length	0.005	1	5039	0.132	.72
Reading skills:Overlap:Length	0.085	1	5051	2.301	.13
Relatedness:Overlap:Length	0.059	1	5049	1.600	.21
Relatedness:Overlap:Phonological skills	0.057	1	5055	1.545	.21
Relatedness:Length:Phonological skills	0.004	1	5062	0.112	.74
Overlap:Length: Phonological skills	0.036	1	5046	0.980	.32
New model: $\log_{10}(\text{FPDT}) \sim (\text{scale}(\text{Reading skills})+\text{Relatedness}+\text{Overlap}+\text{Length})^2 + (\text{scale}(\text{Phonological skills})+\text{Relatedness}+\text{Overlap}+\text{Length})^2 + \text{RE}$ (the slope for Relatedness per item is reintegrated as the model converges with it)					
Reading skills:Relatedness	0.222	1	46	6.040	.018 *
Reading skills:Overlap	0.219	1	4947	5.952	.015 *
Reading skills:Length	0.093	1	47	2.516	.12
Relatedness:Overlap	0.021	1	123	0.584	.45
Relatedness:Length	0.001	1	123	0.020	.89
Overlap:Length	0.156	1	126	4.227	.042 *
Phonological skills:Relatedness	0.029	1	49	0.794	.79
Phonological skills:Overlap	0.066	1	5007	1.793	.18
Phonological skills:Length	0.049	1	49	1.320	.26
New model: $\log_{10}(\text{FPDT}) \sim \text{scale}(\text{Reading skills})*\text{Relatedness} + \text{scale}(\text{Reading skills})*\text{Overlap} + \text{Overlap}*\text{Length} + \text{scale}(\text{Phonological skills}) + \text{RE}$					
Phonological skills	0.041	1	48	1.12	.30

Final model selected: $\log_{10}(\text{FPDT}) \sim \text{scale}(\text{Reading skills})*\text{Relatedness} + \text{scale}(\text{Reading skills})*\text{Overlap} + \text{Overlap}*\text{Length} + (\text{Relatedness}+\text{Length}|\text{Participant}) + (\text{Relatedness}|\text{Item})$



Model summary (p values from model comparison)

Fixed Effects						
	Est/Beta	SE	95% CI	df	t	Significance
Intercept	2.613	0.021	[2.572; 2.654]	66	125.38	<.0001
Reading skills (scaled)	-0.036	0.019	[-0.073; 0.001]	47	-1.91	$\chi^2(1) = 3.70, p = .055$.
Relatedness	0.010	0.006	[-0.002; 0.022]	43	1.71	$\chi^2(1) = 2.48, p = .12$
Overlap	-0.012	0.017	[-0.046; 0.022]	126	-0.68	$\chi^2(1) = 0.39, p = .53$
Length	0.065	0.017	[0.031; 0.099]	126	3.72	$\chi^2(1) = 12.78, p < .001$ ***
Reading skills: Relatedness	0.013	0.006	[0.002; 0.024]	47	2.34	$\chi^2(1) = 4.94, p = .026$ *
Reading skills: Overlap	-0.011	0.005	[-0.021; 0.000]	4978	-2.04	$\chi^2(1) = 4.15, p = .042$ *
Overlap: Length	-0.071	0.035	[-0.139; -0.003]	126	-2.05	$\chi^2(1) = 4.10, p = .043$ *

Random Effects			
	Variance	S.D.	Correlation
Item (Intercept)	0.009	0.094	
Relatedness (Item)	0.001	0.025	0.22
Participant (Intercept)	0.004	0.131	
Relatedness (Participant)	0.0001	0.012	0.13
Length (Participant)	0.0001	0.014	0.10 -0.49
Residual	0.037	0.192	
Model fit			
R ²	Marginal	Conditional	
	0.043	0.44	
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 5292; Nb of participants: 48; Nb of items: 128			

1.1.3 Regression path duration

RANDOM EFFECT STRUCTURE REDUCTION

Data: log10 transformed

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap* Length slope	Intercept + Relatedness*Overlap * Length slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Length * Reading skills +	Intercept + Relatedness*Overlap * Length slope	Intercept + Relatedness, Overlap & Length slopes	Singular fit.					

	Relatedness * Overlap * Length * Phonological skills					
Full_Reduced2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap + Length slope	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Length & Overlap slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Overlap*Length slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced6	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		

	* Phonological skills					
Full_Reduced7	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness & Length slopes	Singular fit.		
Full_Reduced8	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Overlap & Length slopes	Singular fit.		
Full_Reduced9	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced10	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced11	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Length slope	Singular fit.		

Full_Reduced_P1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept	Singular fit.		
Full_Reduced_P2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Length slopes	Intercept	Singular fit.		
Full_Reduced_P4	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Overlap & Length slopes	Intercept	Singular fit.		
Full_Reduced_P5	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness slope	Intercept	Singular fit.		

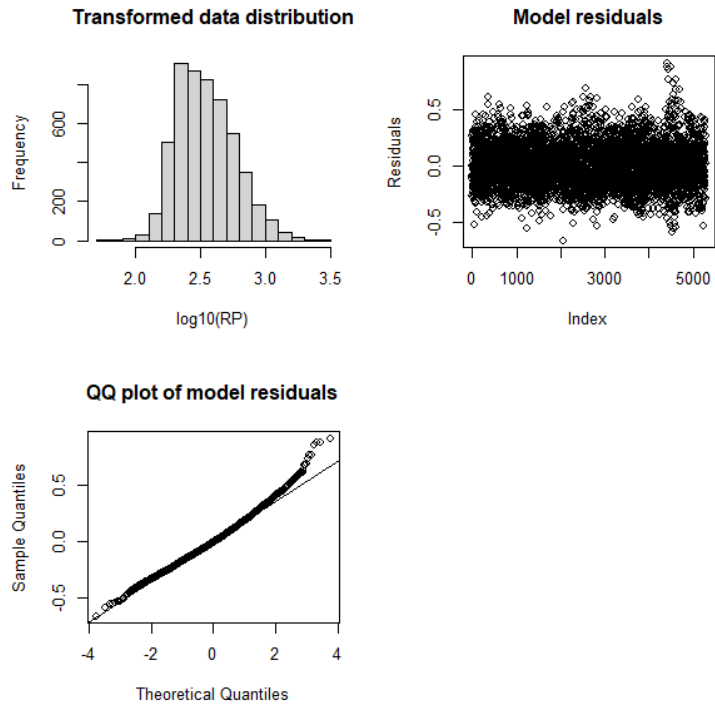
Full_Reduced_P6	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Overlap slope	Intercept	Singular fit.		
Full_Reduced_P7	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Length slope	Intercept	Singular fit.		
Full_Reduced_I1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept	Intercept + Relatedness slope	Converges.		
Full_Reduced_I2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept	Intercept + Overlap slope	Does not converge.		
Full_Reduced_I3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept	Intercept + Length slope	Does not converge.		

Final random-effects structure selected: (1|Participants) + (Relatedness|Item)

FIXED-EFFECTS STRUCTURE REDUCTION with drop 1 (removing non-significant higher order interactions in descending order).

Model reduction					
	Sum Sq	df	Density df	F	<i>p</i>
scale(Reading skills):Relatedness:Overlap:Length	0.13	1	5011	3.64	.056
scale(Phonological skills):Relatedness:Overlap:Length	0.004	1	5021	0.11	.74
New model: log10(FPDT) ~ scale(Reading skills)*Relatedness*Overlap*Length + (scale(Phonological skills)+Relatedness+Overlap+Length)^3 RE					
Relatedness:Overlap:Phonological skills	0.021	1	5020	0.598	.44
Relatedness:Length:Phonological skills	0.004	1	5020	0.116	.73
Overlap:Length: Phonological skills	0.005	1	5065	0.129	.72
New model: log10(FPDT) ~ scale(Reading skills)*Relatedness*Overlap*Length + (scale(Phonological skills)+Relatedness+Overlap+Length)^2 + RE					
Phonological skills:Relatedness	0.020	1	5020	0.571	.45
Phonological skills:Overlap	0.037	1	5065	1.027	.31
Phonological skills:Length	0.008	1	5065	0.231	.63
New model: log10(FPDT) ~ scale(Reading skills)*Relatedness*Overlap*Length + scale(Phonological skills) + RE					
Phonological skills	0.012	1	47	0.34	.56

Final model selected: log10(FPDT) ~ scale(Reading skills)*Relatedness*Overlap*Length + (1|Participant) + (Relatedness|Item)



Model summary (p values from model comparison)

Fixed Effects						
	Est/Beta	SE	95% CI	df	t	Significance
Intercept	2.533	0.015	[2.503; 2.563]	70	167.39	<.0001
Reading skills (scaled)	-0.045	0.013	[-0.071; -0.019]	47	-3.36	$\chi^2(1) = 10.19, p = .001^{**}$
Relatedness	0.002	0.006	[-0.009; 0.014]	127	0.42	$\chi^2(1) = 0.14, p = .71$
Overlap	-0.011	0.014	[-0.039; 0.017]	127	-0.77	$\chi^2(1) = 0.54, p = .46$
Length	0.056	0.014	[0.028; 0.084]	126	3.95	$\chi^2(1) = 14.29, p < .001^{***}$
Reading skills: Relatedness	0.010	0.005	[0.000; 0.020]	5018	1.93	$\chi^2(1) = 3.62, p = .057$
Reading skills: Overlap	-0.017	0.005	[-0.027; -0.007]	5031	-3.25	$\chi^2(1) = 10.31, p = .001^{**}$
Relatedness: Overlap	-0.007	0.012	[-0.030; 0.016]	127	-0.56	$\chi^2(1) = 0.32, p = .57$

Reading skills: Length	-0.004	0.005	[-0.014; 0.006]	5029	-0.73	$\chi^2(1) = 0.46, p = .50$
Relatedness: Length	0.001	0.012	[-0.022; 0.024]	127	0.13	$\chi^2(1) = 0.018, p = .89$
Overlap: Length	-0.069	0.028	[-0.125; -0.014]	127	-2.44	$\chi^2(1) = 6.00, p = .014 *$
Reading skills: Relatedness: Overlap	0.000	0.010	[-0.021; 0.020]	5019	-0.03	$\chi^2(1) = 0, p > .99$
Reading skills: Relatedness: Length	-0.007	0.010	[-0.027; 0.013]	5018	-0.69	$\chi^2(1) = 0.41, p = .52$
Reading skills: Overlap: Length	0.021	0.010	[0.001; 0.041]	5031	2.03	$\chi^2(1) = 4.03, p = .045 *$
Relatedness: Overlap: Length	-0.008	0.023	[-0.054; 0.038]	127	-0.33	$\chi^2(1) = 0.12, p = .73$
Reading skills: Relatedness: Overlap: Length	0.041	0.021	[0.000; 0.082]	5020	1.98	$\chi^2(1) = 3.93, p = .047 *$
Random Effects						
	Variance	S.D.		Correlation		
Item (Intercept)	0.006	0.075				
Relatedness (Item)	< 0.001	0.031		-0.18		
Participant (Intercept)	0.009	0.092				
Residual	0.036	0.19				
Model fit						
R ²	Marginal		Conditional			
	0.062		0.33			
Key: p-values for fixed effects calculated using Satterthwaite's approximations.						
Confidence Intervals have been calculated using the Wald method.						
Nb observations: 5280; Nb of participants: 48; Nb of items: 128						

1.1.4 Regression rate

RANDOM EFFECT STRUCTURE REDUCTION

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Length * Reading skills +	Intercept + Relatedness*Overlap* Length slope	Intercept + Relatedness*Overlap * Length slope	Singular fit.					

	Relatedness * Overlap * Length * Phonological skills					
Full_Reduced1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap * Length slope	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap + Length slope	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Length & Overlap slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Overlap*Length slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		

	* Phonological skills					
Full_Reduced6	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		
Full_Reduced7	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness & Length slopes	Singular fit.		
Full_Reduced8	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Overlap & Length slopes	Singular fit.		
Full_Reduced9	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced10	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Overlap slope	Singular fit.		

Full_Reduced11	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Length slope	Singular fit.		
Full_Reduced_P1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept	Singular fit.		
Full_Reduced_P2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Length slopes	Intercept	Singular fit.		
Full_Reduced_P4	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Overlap & Length slopes	Intercept	Singular fit.		

Full_Reduced_P5	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness slope	Intercept	Singular fit.		
Full_Reduced_P6	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Overlap slope	Intercept	Singular fit.		
Full_Reduced_P7	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Length slope	Intercept	Converges.		
Full_Reduced_I1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Length slope	Intercept + Relatedness slope	Singular.		
Full_Reduced_I2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Length slope	Intercept + Overlap slope	Converges.		

Full_Reduced_I3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Length slope	Intercept + Length slope	Converges.					
<i>We compare models Full_Reduced_I2 and Full_Reduced_I3</i>				AIC	BIC	LL	npar	Df	X ²
Full_Reduced_I2	<i>See above</i>	Intercept + Length slope	Intercept + Overlap slope	3530	3729	-1735	30		
Full_Reduced_I3	<i>See above</i>	Intercept + Length slope	Intercept + Length slope	3532	330	-1736	30	0	0

Final random-effects structure selected: (Length|Participants) + (Length|Item)

FIXED-EFFECTS STRUCTURE REDUCTION with model comparison (removing non-significant higher order interactions in descending order). The significance of each term in the left column was evaluated by comparing a model without it to the model right above in the table.

Model name	Model reduction							
		npar	AIC	BIC	LL	df	χ^2	<i>p</i>
Full	Full model	30	3532	3730	-1736			
Reduced 1	Reading skills:Relatedness:Overlap:Length	29	3530	3722	-1736	1	0.025	.87
<i>The model does not converge. Models are rerun without the Length slope per item.</i>								
Reduced 1	Reading skills:Relatedness:Overlap:Length	27	3527	3705	-1737			
Reduced 2	Phonological skills:Relatedness:Overlap:Length	26	3528	3700	-1738	1	2.68	.10
Reduced 3	Phonological skills:Overlap:Length	25	3526	3691	-1738	1	0.27	.60
Reduced 4	Phonological skills:Relatedness:Length	24	3527	3685	-1739	1	2.63	.10
Reduced 5	Phonological skills:Relatedness:Overlap	23	3525	3677	-1739	1	0.05	.82
Reduced 6	Relatedness:Overlap:Length	22	3523	3668	-1739	1	0.12	.73
Reduced 7	Reading skills:Overlap:Length	21	3522	3661	-1740	1	1.37	.24
Reduced 8	Reading skills:Relatedness:Length	20	3521	3653	-1741	1	0.72	.40
Reduced 9	Reading skills:Relatedness:Overlap	19	3519	3645	-1741	1	0.18	.67
Reduced 10	Phonological skills: Length	18	3517	3636	-1741	1	0.081	.78
Reduced 11	Phonological skills:Overlap	17	3516	3628	-1741	1	0.64	.43
Reduced 12	Phonological skills:Relatedness	16	3617	3622	-1742	1	2.92	.087

This interaction is retained in the model. The following model is therefore compared to model Reduced 11, which includes the Phonological skills: Relatedness interaction.

Reduced 13	Overlap:Length	16	3214	3620	-1741	1	0.082	.77
Reduced 14	Relatedness:Length	15	3513	3613	-1742	1	1.57	.21
Reduced 15	Relatedness:Overlap	14	3514	3606	-1743	1	2.39	.12
Reduced 16	Reading skills:Length	13	3513	3599	-1743	1	0.77	.38
Reduced 17	Reading skills:Overlap	12	3516	3595	-1746	1	4.87	.027 *

This interaction is retained in the model. The following model is therefore compared to model Reduced 16.

Reduced 18	Reading skills:Relatedness	12	3511	3590	-1744	1	0.42	.52
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Final model selected: $\text{Reg_out} \sim \text{scale(Reading skills)} + \text{Relatedness} + \text{Overlap} + \text{Length} + \text{scale(Phonological skills)} + \text{scale(Reading skills):Overlap} + \text{scale(Phonological skills): Relatedness} + (\text{Length}|\text{Subject}) + (1|\text{Item})$, family = binomial(link = "logit").

Model summary (p values from model comparison)

Fixed Effects					
	Est/Beta	SE	95% CI	z	Significance
Intercept	-2.481	0.131	[-2.737; -2.224]	-18.959	<.0001
Reading skills (scaled)	0.212	0.128	[-0.040; 0.463]	1.650	$\chi^2(1) = 4.18, p = .041 *$
Relatedness	-0.063	0.090	[-0.241; 0.114]	-0.702	$\chi^2(1) = 0.18, p = .67$
Overlap	-0.228	0.151	[-0.524; 0.068]	-1.511	$\chi^2(1) = 2.93, p = .087$
Length	-0.008	0.161	[-0.323; 0.307]	-0.050	$\chi^2(1) = 0.0044, p = .95$
Phonological skills (scaled)	0.050	0.128	[-0.201; 0.301]	0.392	$\chi^2(1) = 0.098, p = .75$
Reading skills:Overlap	-0.203	0.090	[-0.380; -0.026]	-2.253	$\chi^2(1) = 4.77, p = .029 *$
Phonological skills: Relatedness	0.221	0.099	[0.026; 0.415]	2.221	$\chi^2(1) = 4.74, p = .030 *$
Random Effects					
	Variance	S.D.	Correlation		
Item (Intercept)	0.44	0.66			
Participant (Intercept)	0.49	0.70			
Length (Participant)	0.030	0.17	0.15		
Model fit					
R ² (theoretical)	Marginal			Conditional	

	0.022	0.24
R ² (delta)	Marginal	Conditional
	0.008	0.09
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 5463; Nb of participants: 48; Nb of items: 128		

1.1.5 Skipping rate

RANDOM EFFECT STRUCTURE REDUCTION

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap* Length slope	Intercept + Relatedness*Overlap * Length slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap * Length slope	Intercept + Relatedness, Overlap & Length slopes	Singular fit.					
Full_Reduced2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap + Length slope	Intercept + Relatedness, Overlap & Length slopes	Singular fit.					

Full_Reduced3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Length & Overlap slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Overlap*Length slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced6	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		
Full_Reduced7	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness & Length slopes	Singular fit.		

Full_Reduced8	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Overlap & Length slopes	Singular fit.		
Full_Reduced9	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced10	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced11	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Length slope	Singular fit.		
Full_Reduced_P1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept	Singular fit.		

Full_Reduced_P2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Length slopes	Intercept	Singular fit.		
Full_Reduced_P4	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Overlap & Length slopes	Intercept	Singular fit.		
Full_Reduced_P5	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness slope	Intercept	Singular fit.		
Full_Reduced_P6	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Overlap slope	Intercept	Singular fit.		

Full_Reduced_P7	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Length slope	Intercept	Singular fit.		
Full_Reduced_I1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept	Intercept + Relatedness slope	Singular fit.		
Full_Reduced_I2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept	Intercept + Overlap slope	Does not converge.		
Full_Reduced_I3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept	Intercept + Length slope	Converges.		

Final random-effects structure selected: (1|Participants) + (Length|Item)

FIXED-EFFECTS STRUCTURE REDUCTION with model comparison (removing non-significant higher order interactions in descending order). The significance of each term in the left column was evaluated by comparing a model without it to the model right above in the table.

Model name	Model reduction							
		npar	AIC	BIC	LL	df	χ^2	<i>p</i>
Full	Full model	28	3664	3852	-1804	1		

Reduced 1	Reading skills:Relatedness:Overlap:Length	27	3663	3844	-1804	1	0.64	.43
Reduced 2	Phonological skills:Relatedness:Overlap:Length	26	3661	3836	-1804	1	0.002	.97
Reduced 3	Phonological skills:Overlap:Length	25	3661	3836	-1804	1	0.32	.56
Reduced 4	Phonological skills:Relatedness:Length	24	3659	3827	-1805	1	1.72	.19
Reduced 5	Phonological skills:Relatedness:Overlap	23	3659	3814	-1807	1	2.28	.13
Reduced 6	Relatedness:Overlap:Length	22	3657	3805	-1807	1	0.11	.74
Reduced 7	Reading skills:Overlap:Length	21	3657	3798	-1808	1	1.82	.18
Reduced 8	Reading skills:Relatedness:Length	20	3657	3798	-1808	1	0.01	.92
Reduced 9	Reading skills:Relatedness:Overlap	19	3653	3781	-1808	1	0.11	.74
Reduced 10	Phonological skills: Length	18	3652	3773	-1808	1	0.64	.42
Reduced 11	Phonological skills:Overlap	17	3650	3764	-1808	1	0.18	.67
Reduced 12	Phonological skills:Relatedness	16	3648	3756	-1808	1	0	1
Reduced 13	Overlap:Length	15	3647	3748	-1808	1	0.86	.35
Reduced 14	Relatedness:Length	14	3645	3739	-1809	1	0.42	.51
Reduced 15	Relatedness:Overlap	13	3645	3732	-1809	1	1.48	.22
Reduced 16	Reading skills:Length	12	3643	3724	-1810	1	0.32	.57
Reduced 17	Reading skills:Overlap	11	3641	3715	-1810	1	0.009	.93
Reduced 18	Reading skills:Relatedness	10	3641	3715	-1810	1	0.14	.71
Reduced 19	Phonological skills	9	3637	3698	-1810	1	0.14	.70
Reduced 20	Reading skills	8	3639	3693	-1812	1	3.76	.053

Final model selected: Skips ~ scale(Reading skills)+Relatedness+Overlap+Length + (1|Subject) + (Length|Item), family = binomial(link = “logit”).

Model summary (*p* values from model comparison)

Fixed Effects					
	Est/Beta	SE	95% CI	z	Significance
Intercept	-2.41	0.20	[-2.80; -2.03]	-12.23	<.0001 ***
Reading skills (scaled)	0.29	0.15	[0.004; 0.58]	1.99	$\chi^2(1) = 3.76, p = .053$ *
Relatedness	0.11	0.09	[-0.06; 0.28]	1.24	$\chi^2(1) = 1.45, p = .23$
Overlap	-0.19	0.19	[-0.57; 0.19]	-0.99	$\chi^2(1) = 1.16, p = .28$
Length	-0.68	0.20	[-1.07; -0.29]	-3.45	$\chi^2(1) = 11.16, p < .001$ ***
Random Effects					
	Variance	S.D.	Correlation		

Item (Intercept)	0.88	0.94	
Length (Item)	0.63	0.79	-0.46
Participant (Intercept)	0.93	0.97	
Model fit			
R ² (theoretical)	Marginal	Conditional	
	0.022	0.24	
R ² (delta)	Marginal	Conditional	
	0.008	0.09	
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 6138; Nb of participants: 48; Nb of items: 128			

1.2 Spillover

1.2.1 First pass dwell time

RANDOM EFFECT STRUCTURE REDUCTION

Data: log10 transformed

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap* Length slope	Intercept + Relatedness*Overlap * Length slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length	Intercept + Relatedness*Overlap * Length slope	Intercept + Relatedness, Overlap & Length slopes	Singular fit.					

	* Phonological skills					
Full_Reduced2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap + Length slope	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Length & Overlap slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Overlap*Length slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced6	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		

Full_Reduced7	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness & Length slopes	Singular fit.		
Full_Reduced8	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Overlap & Length slopes	Singular fit.		
Full_Reduced9	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced10	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced11	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Length slope	Singular fit.		

Full_Reduced_P1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept	Singular fit.		
Full_Reduced_P2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Length slopes	Intercept	Does not converge.		
Full_Reduced_P4	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Overlap & Length slopes	Intercept	Singular fit.		
Full_Reduced_P5	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness slope	Intercept	Singular fit.		

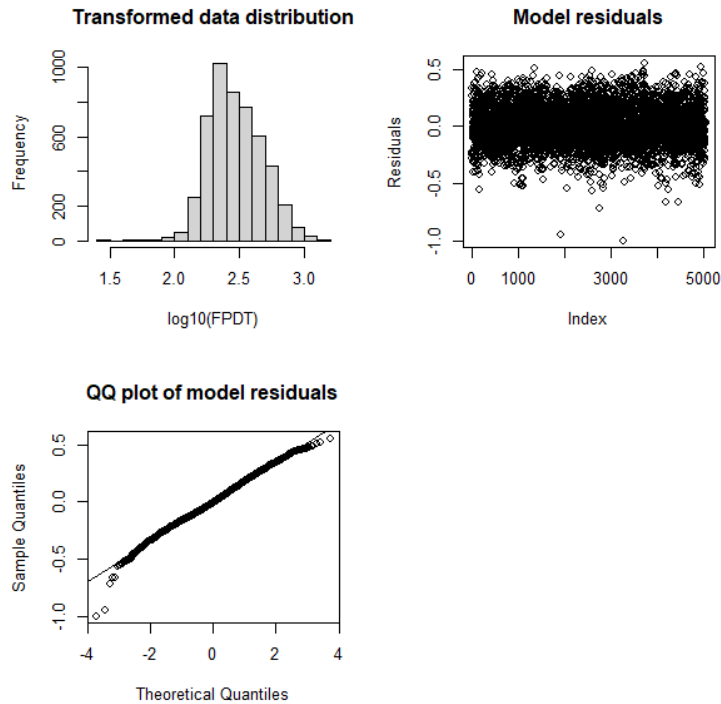
Full_Reduced_P6	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Overlap slope	Intercept	Singular fit.		
Full_Reduced_P7	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Length slope	Intercept	Converges.		
Full_Reduced_I1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Length slope	Intercept + Relatedness slope	Singular.		
Full_Reduced_I2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Length slope	Intercept + Overlap slope	Does not converge.		
Full_Reduced_I3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Length slope	Intercept + Length slope	Singular.		

Final random-effects structure selected: (1|Participants) + (Relatedness|Item)

FIXED-EFFECTS STRUCTURE REDUCTION with drop 1 (removing non-significant higher order interactions in descending order).

Model reduction					
	Sum Sq	df	Density df	F	<i>p</i>
scale(Reading skills):Relatedness:Overlap:Length	< 0.001	1	4857	0.011	.97
scale(Phonological skills):Relatedness:Overlap:Length	0.084	1	4874	2.75	.097.
New model: log10(FPDT) ~ scale(Phonological skills)*Relatedness*Overlap*Length + (scale(Reading skills)+Relatedness+Overlap+Length)^3 RE					
Relatedness:Overlap:Reading skills	0.019	1	4853	0.61	.43
Relatedness:Length: Reading skills	0.019	1	4847	0.61	.43
Overlap:Length: Reading skills	< 0.001	1	4855	0.003	.96
New model: log10(FPDT) ~ scale(Phonological skills)*Relatedness*Overlap*Length + (scale(Reading skills)+Relatedness+Overlap+Length)^2 + RE					
Reading skills:Relatedness	0.030	1	4845	0.97	.33
Reading skills:Overlap	0.034	1	4856	1.12	.29
Reading skills:Length	0.046	1	48	1.49	.23
New model: log10(FPDT) ~ scale(Reading skills)*Relatedness*Overlap*Length + scale(Phonological skills) + RE					
Reading skills	0.52	1	48	17.06	.0001 ***

Final model selected: log10(FPDT) ~scale(Reading skills) + scale(Phonological skills)*Relatedness*Overlap*Length + (Length|Participant) + (1|Item)



Model summary (p values from model comparison)

Fixed Effects						
	Est/Beta	SE	95% CI	df	t	Significance
Intercept	2.461	0.012	[2.438; 2.484]	82	210.54	<.0001
Phonological skills (scaled)	-0.007	0.011	[-0.029; 0.015]	49	-0.64	$\chi^2(1) = 0.97, p = .81$
Relatedness	0.001	0.005	[-0.009; 0.011]	4845	0.21	$\chi^2(1) = 0.016, p = .90$
Overlap	0.005	0.013	[-0.021; 0.030]	126	0.35	$\chi^2(1) = 0.12, p = .73$
Length	0.012	0.013	[-0.014; 0.038]	127	0.92	$\chi^2(1) = 0.84, p = .36$
Reading skills (scaled)	-0.045	0.011	[-0.067; -0.024]	48	-4.13	$\chi^2(1) = 14.30, p < .001$ ***
Phonological skills: Relatedness	0.008	0.005	[-0.002; 0.018]	4866	1.56	$\chi^2(1) = 2.65, p = .10$
Phonological skills: Overlap	-0.001	0.005	[-0.011; 0.009]	4857	-0.20	$\chi^2(1) = 0.08, p = .78$

Full	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap* Length slope	Intercept + Relatedness*Overlap * Length slope	Singular fit.		
Full_Reduced1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap * Length slope	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap + Length slope	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Length & Overlap slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Overlap*Length slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		

Full_Reduced5	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced6	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		
Full_Reduced7	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness & Length slopes	Singular fit.		
Full_Reduced8	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Overlap & Length slopes	Singular fit.		
Full_Reduced9	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness slope	Singular fit.		

Full_Reduced10	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced11	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Length slope	Singular fit.		
Full_Reduced_P1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept	Singular fit.		
Full_Reduced_P2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Length slopes	Intercept	Singular fit.		

Full_Reduced_P4	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Overlap & Length slopes	Intercept	Singular fit.		
Full_Reduced_P5	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness slope	Intercept	Singular fit.		
Full_Reduced_P6	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Overlap slope	Intercept	Converges.		
Full_Reduced_P7	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Length slope	Intercept	Converges.		
<i>No difference between full reduced p6 and p7 ($\chi^2(0) = 0$)</i>						
Full_Reduced_I1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Length slope	Intercept + Relatedness slope	Converges.		

Full_Reduced_I2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Length slope	Intercept + Overlap slope	Does not converge.		
Full_Reduced_I3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Length slope	Intercept + Length slope	Does not converge.		

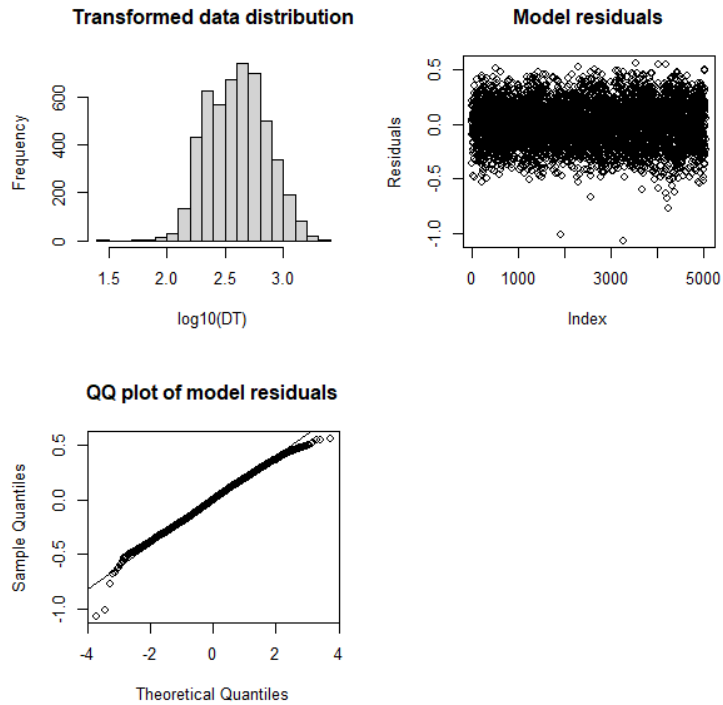
Final random-effects structure selected: (Length|Participants) + (Relatedness|Item)

FIXED-EFFECTS STRUCTURE REDUCTION with drop 1 (removing non-significant higher order interactions in descending order).

Model reduction					
	Sum Sq	df	Density df	F	<i>p</i>
scale(Reading skills):Relatedness:Overlap:Length	0.072	1	4761	1.86	.17
scale(Phonological skills):Relatedness:Overlap:Length	0.014	1	4761	0.36	.55
New model: $\log_{10}(\text{FPDT}) \sim (\text{scale}(\text{Reading skills}) + \text{Relatedness} + \text{Overlap} + \text{Length})^3 + (\text{scale}(\text{Phonological skills}) + \text{Relatedness} + \text{Overlap} + \text{Length})^3 + \text{RE}$					
Reading skills:Relatedness:Overlap	0.051	1	4762	1.32	.25
Reading skills:Relatedness:Length	0.024	1	4755	0.62	.43
Reading skills:Overlap:Length	0.089	1	4759	2.30	.13
Relatedness:Overlap:Length	0.014	1	123	0.37	.55
Relatedness:Overlap:Phonological skills	0.047	1	4767	1.20	.27
Relatedness:Length:Phonological skills	0.084	1	4757	2.15	.14
Overlap:Length: Phonological skills	0.054	1	4816	1.38	.24
New model: $\log_{10}(\text{FPDT}) \sim (\text{scale}(\text{Reading skills}) + \text{Relatedness} + \text{Overlap} + \text{Length})^2 + (\text{scale}(\text{Phonological skills}) + \text{Relatedness} + \text{Overlap} + \text{Length})^2 + \text{RE}$					

Reading skills:Relatedness	0.003	1	4753	0.07	.80
Reading skills:Overlap	0.001	1	4761	0.03	.85
Reading skills:Length	0.000	1	44	0.00	.96
Relatedness:Overlap	0.007	1	124	0.18	.67
Relatedness:Length	0.039	1	123	1.00	.32
Overlap:Length	0.042	1	127	1.09	.30
Phonological skills:Relatedness	0.005	1	4755	0.14	.71
Phonological skills:Overlap	0.000	1	4813	0.00	.99
Phonological skills:Length	0.023	1	47	0.58	.45
New model: $\log_{10}(\text{FPDT}) \sim \text{scale}(\text{Reading skills}) + \text{Relatedness} + \text{Overlap} + \text{Length} + \text{scale}(\text{Phonological skills}) + \text{RE}$					
Reading skills	0.053	1	47	1.36	.25
Relatedness	0.023	1	124	0.59	.44
Overlap	0.000	1	127	0.01	.94
Length	0.079	1	129	2.03	.16
Phonological skills	0.042	1	48	1.06	.31

Final model selected: $\log_{10}(\text{FPDT}) \sim \text{Relatedness} + \text{Overlap} + \text{Length} + (\text{Length}|\text{Participant}) + (\text{Relatedness}|\text{Item})$



Model summary (p values from model comparison)

Fixed Effects						
	Est/Beta	SE	95% CI	df	t	Significance
Intercept	2.591	0.020	[-0.007; 0.016]	66	126.57	<.0001
Relatedness	0.005	0.006	[-0.035; 0.033]	124	0.77	$\chi^2(1) = 0.57, p = .45$
Overlap	-0.001	0.017	[-0.009; 0.060]	127	-0.07	$\chi^2(1) = 0.007, p = .93$
Length	0.026	0.018	[-0.007; 0.016]	129	1.44	$\chi^2(1) = 2.04, p = .15$
Random Effects						
	Variance		S.D.		Correlation	
Item (Intercept)	0.009		0.093			

Relatedness (Item)	0.001	0.023	0.15
Participant (Intercept)	0.016	0.13	
Length (Participant)	0.001	0.024	-0.73
Residual	0.039	0.20	
Model fit			
R ²	Marginal	Conditional	
	0.003	0.40	
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 5046; Nb of participants: 48; Nb of items: 128			

1.2.3 Regression path duration

RANDOM EFFECT STRUCTURE REDUCTION

Data: log10 transformed

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap* Length slope	Intercept + Relatedness*Overlap * Length slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap * Length slope	Intercept + Relatedness, Overlap & Length slopes	Singular fit.					

Full_Reduced2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap + Length slope	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Length & Overlap slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Overlap*Length slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced6	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		

Full_Reduced7	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness & Length slopes	Singular fit.		
Full_Reduced8	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Overlap & Length slopes	Singular fit.		
Full_Reduced9	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced10	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced11	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Length slope	Singular fit.		

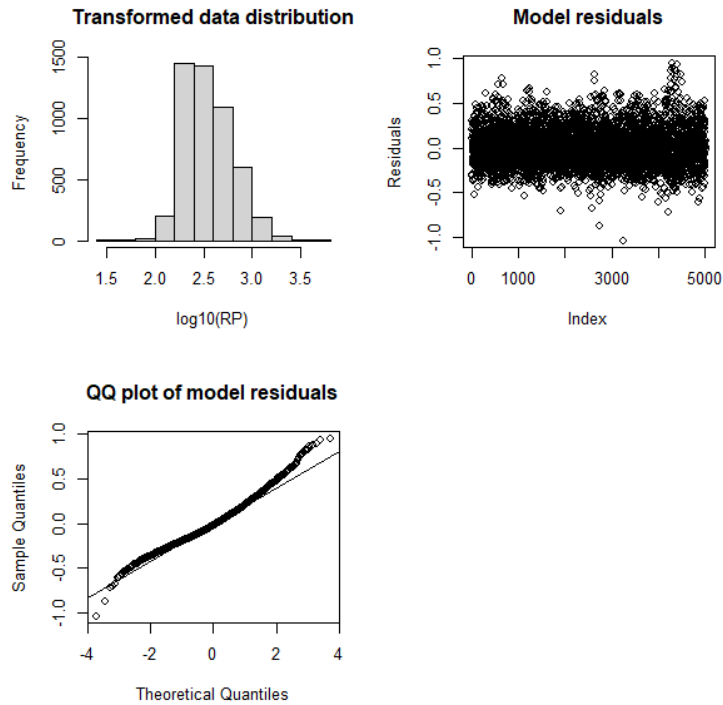
Full_Reduced_P1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept	Singular fit.		
Full_Reduced_P2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Length slopes	Intercept	Singular fit.		
Full_Reduced_P4	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Overlap & Length slopes	Intercept	Singular fit.		
Full_Reduced_P5	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness slope	Intercept	Singular fit.		

Full_Reduced_P6	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Overlap slope	Intercept	Singular fit.		
Full_Reduced_P7	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Length slope	Intercept	Converges.		
Full_Reduced_I1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Length slope	Intercept + Relatedness slope	Singular.		
Full_Reduced_I2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Length slope	Intercept + Overlap slope	Does not converge.		
Full_Reduced_I3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Length slope	Intercept + Length slope	Does not converge.		

FIXED-EFFECTS STRUCTURE REDUCTION with drop 1 (removing non-significant higher order interactions in descending order).

Model reduction					
	Sum Sq	df	Density df	F	<i>p</i>
scale(Reading skills):Relatedness:Overlap:Length	0.13	1	4817	2.87	.091 .
scale(Phonological skills):Relatedness:Overlap:Length	0.002	1	4836	0.039	.84
New model: log10(FPDT) ~ scale(Reading skills)*Relatedness*Overlap*Length + (scale(Phonological skills)+Relatedness+Overlap+Length)^3 RE					
Relatedness:Overlap:Phonological skills	0.002	1	4837	0.05	.82
Relatedness:Length:Phonological skills	0.16	1	4829	3.51	.06 .
Overlap:Length: Phonological skills	0.064	1	4820	1.39	.24
New model: log10(FPDT) ~ scale(Reading skills)*Relatedness*Overlap*Length + (scale(Phonological skills)+Relatedness+Overlap+Length)^2 + RE					
Phonological skills:Overlap	< 0.001	1	4813	0.006	.94

Final model selected: log10(FPDT) ~ scale(Reading skills)*Relatedness*Overlap*Length + (1|Participant) + (Relatedness|Item)



Model summary (p values from model comparison)

Fixed Effects						
	Est/Beta	SE	95% CI	df	t	Significance
Intercept	2.535	0.015	[2.506; 2.565]	89	168.33	<.0001
Reading skills (scaled)	-0.039	0.014	[-0.067; -0.011]	47	-2.76	$\chi^2(1) = 11.25, p < .001$ ***
Relatedness	0.024	0.006	[0.012; 0.035]	4808	3.87	$\chi^2(1) = 14.87, p < .001$ ***
Overlap	-0.001	0.018	[-0.036; 0.034]	126	-0.05	$\chi^2(1) = 0.002, p = .96$
Length	0.036	0.018	[0.001; 0.072]	128	2.00	$\chi^2(1) = 3.92, p = .048$ *
Phonological skills (scaled)	-0.010	0.014	[-0.038; 0.017]	47	-0.74	$\chi^2(1) = 0.64, p = .42$
Reading skills: Relatedness	0.014	0.007	[0.001; 0.028]	4810	2.04	$\chi^2(1) = 3.08, p = .079$.
Reading skills: Overlap	0.004	0.006	[-0.008; 0.015]	4822	0.59	$\chi^2(1) = 0.35, p = .55$

Full	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap* Length slope	Intercept + Relatedness*Overlap * Length slope	Singular fit.		
Full_Reduced1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap * Length slope	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap + Length slope	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Length & Overlap slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Overlap*Length slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		

Full_Reduced5	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced6	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		
Full_Reduced7	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness & Length slopes	Singular fit.		
Full_Reduced8	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Overlap & Length slopes	Singular fit.		
Full_Reduced9	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness slope	Singular fit.		

Full_Reduced10	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced11	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Length slope	Singular fit.		
Full_Reduced_P1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept	Singular fit.		
Full_Reduced_P2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Length slopes	Intercept	Singular fit.		

Full_Reduced_P4	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Overlap & Length slopes	Intercept	Singular fit.		
Full_Reduced_P5	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness slope	Intercept	Singular fit.		
Full_Reduced_P6	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Overlap slope	Intercept	Singular fit.		
Full_Reduced_P7	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Length slope	Intercept	Converges.		
Full_Reduced_I1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Length slope	Intercept + Relatedness slope	Singular.		

Full_Reduced_I2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Length slope	Intercept + Overlap slope	Singular.		
Full_Reduced_I3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Length slope	Intercept + Length slope	Converges.		

Final random-effects structure selected: (Length|Participants) + (Length|Item)

FIXED-EFFECTS STRUCTURE REDUCTION with model comparison (removing non-significant higher order interactions in descending order). The significance of each term in the left column was evaluated by comparing a model without it to the model right above in the table.

Model name	Model reduction							
		npar	AIC	BIC	LL	df	χ^2	<i>p</i>
Full	Full model	30	4142	4333	-2042			
Reduced 1	Reading skills:Relatedness:Overlap:Length	29	4143	4333	-2042	1	2.61	.11
Reduced 2	Phonological skills:Relatedness:Overlap:Length	28	4145	4328	2044	1	3.91	.048 *
<i>This interaction is retained in the model. The following model is therefore compared to model Reduced 1</i>								
Reduced 3	Reading skills:Overlap:Length	28	4141	4325	-2043	1	0.56	.45
Reduced 4	Reading skills:Relatedness:Length	27	4139	4316	-2043	1	0.08	.78
Reduced 5	Reading skills:Relatedness:Overlap	26	4139	4309	-2044	1	1.55	.21
Reduced 6	Reading skills:Length	25	4144	4308	-2047	1	6.94	.008 **
<i>This interaction is retained in the model. The following model is therefore compared to model Reduced 5</i>								
Reduced 7	Reading skills:Overlap	25	4137	4301	-2044	1	0.031	.86
Reduced 8	Reading skills: Relatedness	24	4137	4295	-2045	1	2.22	.14

Final model selected: $\text{Reg_out} \sim \text{scale(Reading skills)+Relatedness+Overlap+Length} + \text{scale(Phonological skills)+ scale(Reading skills):Length} + \text{Relatedness:Overlap} + \text{Relatedness:Length+ Overlap:Length} + \text{scale(Phonological skills): Relatedness} + \text{scale(Phonological skills): Overlap} + \text{scale(Phonological skills):Length+ Relatedness:Overlap:Length+ scale(Phonological skills):Relatedness:Overlap} + \text{scale(Phonological skills):Relatedness:Length+ scale(Phonological skills):Overlap:Length+ scale(Phonological skills):Relatedness:Overlap:Length} + (\text{Length|Subject}) + (\text{Length|Item})$, family = binomial(link = "logit").

Model summary (p values from model comparison)

Fixed Effects					
	Est/Beta	SE	95% CI	z	Significance
Intercept	-2.077	0.113	[-2.300; -1.855]	-18.31	<.0001
Reading skills (scaled)	0.110	0.101	[-0.089; 0.308]	1.08	$\chi^2(1) = 1.20, p = .27$
Relatedness	0.342	0.083	[0.179; 0.506]	4.10	$\chi^2(1) = 15.91, p < .001$ ***
Overlap	-0.037	0.155	[-0.340; 0.266]	-0.24	$\chi^2(1) = 0.30, p = .58$
Length	0.328	0.167	[0.001; 0.655]	1.97	$\chi^2(1) = 4.05, p = .044$ *
Phonological skills (scaled)	0.006	0.102	[-0.195; 0.207]	0.06	$\chi^2(1) = 0.10, p = .75$
Reading skills:Length	0.280	0.101	[0.082; 0.478]	2.77	$\chi^2(1) = 2.32, p = .13$
Relatedness: Overlap	0.171	0.167	[-0.156; 0.497]	1.02	$\chi^2(1) = 0.34, p = .56$
Relatedness: Length	0.255	0.167	[-0.072; 0.582]	1.53	$\chi^2(1) = 3.49, p = .061$.
Overlap:Length	-0.058	0.309	[-0.664; 0.548]	-0.19	$\chi^2(1) = 0.15, p = .70$
Relatedness: Phonological skills	-0.214	0.091	[-0.393; -0.035]	-2.34	$\chi^2(1) = 5.18, p = .023$ *
Overlap: Phonological skills	0.113	0.091	[-0.065; 0.291]	1.24	$\chi^2(1) = 1.09, p = .30$
Length: Phonological skills	-0.324	0.108	[-0.537; -0.112]	-2.99	$\chi^2(1) = 6.25, p = .012$ *
Relatedness:Overlap:Length	-0.236	0.333	[-0.889; 0.417]	-0.71	$\chi^2(1) = 0.15, p = .70$
Relatedness: Overlap: Phonological skills	-0.170	0.182	[-0.526; 0.186]	-0.94	$\chi^2(1) = 0.65, p = .42$
Relatedness: Length: Phonological skills	0.271	0.182	[-0.085; 0.627]	1.49	$\chi^2(1) = 1.38, p = .24$
Overlap: Length: Phonological skills	-0.343	0.182	[-0.699; 0.013]	-1.89	$\chi^2(1) = 2.25, p = .13$
Relatedness: Overlap: Length: Phonological skills	0.723	0.363	[0.011; 1.434]	1.99	$\chi^2(1) = 3.82, p = .051$.
Random Effects					
	Variance	S.D.	Correlation		
Item (Intercept)	0.26	0.51			
Length (Item)	1.00	1.00	0.02		
Participant (Intercept)	0.29	0.54			
Length (Participant)	0.054	0.23	-0.01		

Model fit		
R ² (theoretical)	Marginal	Conditional
	0.033	0.23
R ² (delta)	Marginal	Conditional
	0.015	0.11
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 5203; Nb of participants: 48; Nb of items: 128		

1.2.5 Skipping rate

RANDOM EFFECT STRUCTURE REDUCTION

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap* Length slope	Intercept + Relatedness*Overlap * Length slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap * Length slope	Intercept + Relatedness, Overlap & Length slopes	Singular fit.					
Full_Reduced2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length	Intercept + Relatedness*Overlap + Length slope	Intercept + Relatedness, Overlap & Length slopes	Singular fit.					

	* Phonological skills					
Full_Reduced3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Length & Overlap slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Overlap*Length slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced6	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		
Full_Reduced7	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness & Length slopes	Singular fit.		

Full_Reduced8	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Overlap & Length slopes	Singular fit.		
Full_Reduced9	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced10	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced11	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Length slope	Singular fit.		
Full_Reduced_P1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept	Singular fit.		

Full_Reduced_P2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Length slopes	Intercept	Converges		
Full_Reduced_P4	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Overlap & Length slopes	Intercept	Singular fit.		
Full_Reduced_I1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Length slopes	Intercept + Relatedness slope	Does not converge.		
Full_Reduced_I2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Length slopes	Intercept + Overlap slope	Converges.		

Full_Reduced_I3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Length slopes	Intercept + Length slope	Converges.					
<i>We compare models Full_Reduced_I2 and Full_Reduced_I3</i>				AIC	BIC	LL	npar	Df	X ²
Full_Reduced_I2	<i>See above</i>	Intercept + Relatedness & Length slopes	Intercept + Overlap slope	4389	4611	-2161	33		
Full_Reduced_I3	<i>See above</i>	Intercept + Relatedness & Length slopes	Intercept + Length slope	4385	4606	-2159	33	0	4.38

Final random-effects structure selected: (Relatedness + Length|Participants) + (Length|Item)

FIXED-EFFECTS STRUCTURE REDUCTION with model comparison (removing non-significant higher order interactions in descending order). The significance of each term in the left column was evaluated by comparing a model without it to the model right above in the table.

Model name	Model reduction	Model reduction						
		npar	AIC	BIC	LL	df	χ^2	<i>p</i>
Full	Full model	33	4385	4606	-2159			
Reduced 1	Reading skills:Relatedness:Overlap:Length	32	4383	4598	-2159	1	0.23	.64
Reduced 2	Phonological skills:Relatedness:Overlap:Length	31	4384	4592	-2159	1	3.01	.083
Reduced 3	Phonological skills:Overlap:Length	30	4382	4583	-2161	1	0.42	.84
Reduced 4	Phonological skills:Relatedness:Length	29	4380	4575	-2161	1	0.49	.49
Reduced 5	Phonological skills:Relatedness:Overlap	28	4384	4572	-2164	1	5.74	.017 *
<i>This interaction is retained in the model. The next model is compared to model Reduced 4.</i>								
Reduced 6	Relatedness:Overlap:Length	28	4831	4569	-2161	1	2.58	0.11
Reduced 7	Reading skills:Overlap:Length	27	4380	4561	-2163	1	0.71	.40
Reduced 8	Reading skills:Relatedness:Length	26	4378	4553	-2163	1	0.26	.61
Reduced 9	Reading skills:Relatedness:Overlap	25	4377	4545	-2164	1	1.23	.27
Reduced 10	Phonological skills:Length	24	4376	4537	-2164	1	0.50	.48
Reduced 11	Overlap:Length	23	4378	4533	-2166	1	4.62	.032 *
<i>This interaction is retained in the model. The next model is compared to model Reduced 10.</i>								

<i>Model 12 is singular. The random-effects structure is reduced by removing the slope for Length by item.</i>								
Reduced 10b	Phonological skills:Length	22	4375	4516	-2166	1		
Reduced 12	Relatedness:Length	21	4376	4524	-2166	1	0.60	.44
<i>Model 13 is singular. The random-effects structure is reduced by removing the slope for Length by Participant.</i>								
Reduced 12b	Relatedness:Length	18	4373	4494	-2169	1		
Reduced 13	Reading skills:Length	17	4371	4486	-2169	1	0.008	.93
Reduced 14	Reading skills:Overlap	16	4370	4478	-2169	1	0.98	.32
Reduced 15	Reading skills:Relatedness	15	4368	4469	-2169	1	0.045	.83
Reduced 16	Reading skills	14	4373	4467	-2173	1	7.05	.008 **

Final model selected: Skips ~ scale(Reading skills)+Relatedness+Overlap+Length + scale(Phonological skills)+ Relatedness:Overlap + Overlap:Length +scale(Phonological skills): Relatedness + scale(Phonological skills): Overlap + scale(Phonological skills):Relatedness:Overlap + (Relatedness|Subject) + (1|Item), family = binomial(link = “logit”).

Model summary (*p* values from model comparison)

Fixed Effects					
	Est/Beta	SE	95% CI	z	Significance
Intercept	-2.33	0.21	[-2.74; -1.92]	-11.11	<.0001 ***
Reading skills (scaled)	0.45	0.16	[0.13; 0.76]	2.77	$\chi^2(1) = 8.19, p = .004$ **
Relatedness	-0.11	0.09	[-0.29; 0.07]	-1.23	$\chi^2(1) = 1.61, p = .21$
Overlap	-0.16	0.32	[-0.78; 0.46]	-0.50	$\chi^2(1) = 1.71, p = .19$
Length	-0.16	0.23	[-0.60; 0.28]	-0.72	$\chi^2(1) = 0.45, p = .50$
Phonological skills (scaled)	-0.04	0.16	[-0.36; 0.27]	-0.28	$\chi^2(1) = 0.08, p = .78$
Relatedness: Overlap	0.06	0.16	[-0.25; 0.37]	0.38	$\chi^2(1) = 0.26, p = .61$
Overlap: Length	0.96	0.45	[0.08; 1.84]	2.13	$\chi^2(1) = 4.43, p = .035$ *
Relatedness: Phonological skills	-0.04	0.08	[-0.20; 0.11]	-0.56	$\chi^2(1) = 0.15, p = .69$
Overlap: Phonological skills	-0.10	0.08	[-0.25; 0.05]	-1.29	$\chi^2(1) = 1.64, p = .20$
Relatedness: Overlap: Phonological skills	0.33	0.15	[0.03; 0.63]	2.16	$\chi^2(1) = 4.51, p = .034$ *
Random Effects					
	Variance	S.D.	Correlation		
Item (Intercept)	1.35	1.16			
Participant (Intercept)	0.86	0.93			

Relatedness (Participant)	0.01	0.11	0.31
Model fit			
R ² (theoretical)	Marginal	Conditional	
	0.049	0.43	
R ² (delta)	Marginal	Conditional	
	0.028	0.24	
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 6138; Nb of participants: 48; Nb of items: 128			

1.3 Prime / Control

1.3.1 First pass dwell time

RANDOM EFFECT STRUCTURE REDUCTION

Data: log10 transformed

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap* Length slope	Intercept + Relatedness*Overlap * Length slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length *	Intercept + Relatedness*Overlap * Length slope	Intercept + Relatedness, Overlap & Length slopes	Singular fit.					

	Phonological skills					
Full_Reduced2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap + Length slope	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Length & Overlap slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Overlap*Length slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length *	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		

	Phonological skills					
Full_Reduced6	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		
Full_Reduced7	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness & Length slopes	Singular fit.		
Full_Reduced8	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Overlap & Length slopes	Singular fit.		
Full_Reduced9	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length *	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness slope	Singular fit.		

	Phonological skills					
Full_Reduced10	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced11	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Length slope	Singular fit.		
Full_Reduced_P1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept	Singular fit.		
Full_Reduced_P2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length *	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		

	Phonological skills					
Full_Reduced_P3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Length slopes	Intercept	Singular fit.		
Full_Reduced_P4	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Overlap & Length slopes	Intercept	Singular fit.		
Full_Reduced_P5	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness slope	Intercept	Singular fit.		
Full_Reduced_P6	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length *	Intercept + Overlap slope	Intercept	Singular fit.		

	Phonological skills					
Full_Reduced_P7	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Length slope	Intercept	Converges.		
Full_Reduced_I1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Length slope	Intercept + Relatedness slope	Converges.		
Full_Reduced_I2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Length slope	Intercept + Overlap slope	Converges.		
Full_Reduced_I3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length *	Intercept + Length slope	Intercept + Length slope	Does not converge.		

	Phonological skills								
Full_Reduced_I4	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Length slope	Intercept + Relatedness & Overlap slopes	Does not converge					
				AIC	BIC	LL	npar	Df	X ²
Full_Reduced_I1	<i>See above</i>	Intercept + Length slope	Intercept + Relatedness slope	-3180	-2975	1621	31		
Full_Reduced_I2	<i>See above</i>	Intercept + Length slope	Intercept + Overlap slope	-3158	-2954	1610	31	0	0

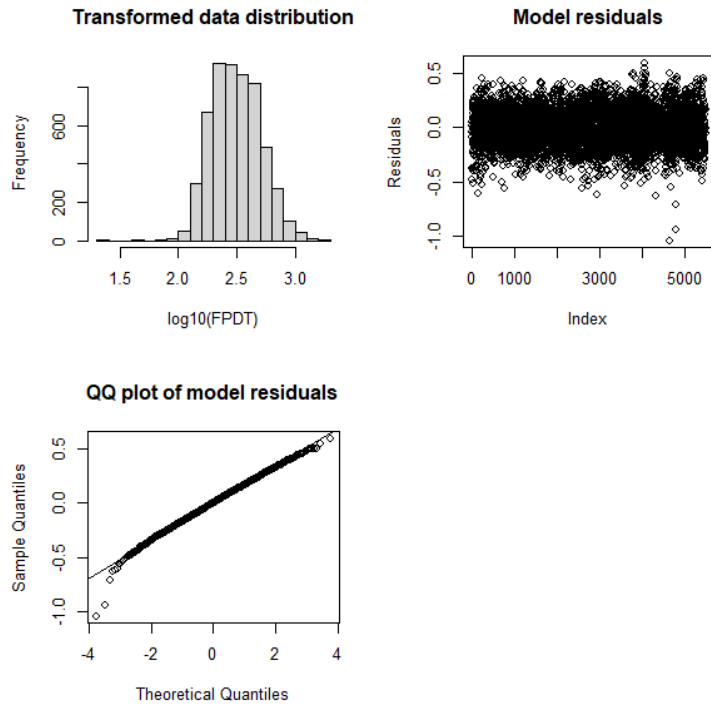
Final random-effects structure selected: (Length|Participants) + (Relatedness|Item)

FIXED-EFFECTS STRUCTURE REDUCTION with drop 1 (removing non-significant higher order interactions in descending order).

Model reduction					
	Sum Sq	df	Density df	F	<i>p</i>
scale(Reading skills):Relatedness:Overlap:Length	0.049	1	5163	1.64	.20
scale(Phonological skills):Relatedness:Overlap:Length	0.006	1	5170	0.19	.66
New model: $\log_{10}(\text{FPDT}) \sim (\text{scale}(\text{Reading skills}) + \text{Relatedness} + \text{Overlap} + \text{Length})^3 + (\text{scale}(\text{Phonological skills}) + \text{Relatedness} + \text{Overlap} + \text{Length})^3 + \text{RE}$					
<i>Singular – remove Relatedness from Item random effects</i>					
Reading skills:Relatedness:Overlap	0.002	1	5163	0.08	.77
Reading skills:Relatedness:Length	0.075	1	5159	2.52	.11
Reading skills:Overlap:Length	0.017	1	5160	0.56	.45
Relatedness:Overlap:Length	0.011	1	127	0.37	.54
Relatedness:Overlap:Phonological skills	0.016	1	5169	0.53	.46
Relatedness:Length:Phonological skills	0.015	1	5167	0.51	.48

Overlap:Length: Phonological skills	0.005	1	5210	0.16	.69
New model: $\log_{10}(\text{FPDT}) \sim (\text{scale}(\text{Reading skills}) + \text{Relatedness} + \text{Overlap} + \text{Length})^2 + (\text{scale}(\text{Phonological skills}) + \text{Relatedness} + \text{Overlap} + \text{Length})^2 + \text{RE}$ (the slope for Relatedness per item is reintegrated as the model converges with it)					
Reading skills:Relatedness	0.021	1	5271	0.70	40
Reading skills:Overlap	0.000	1	5274	0.00	96
Reading skills:Length	0.000	1	45	0.01	92
Relatedness:Overlap	0.026	1	5272	0.85	36
Relatedness:Length	0.001	1	5271	0.03	85
Overlap:Length	0.064	1	127	2.13	15
Phonological skills:Relatedness	0.030	1	5281	0.99	32
Phonological skills:Overlap	0.004	1	5273	0.15	70
Phonological skills:Length	0.006	1	45	0.21	65
New model: $\log_{10}(\text{FPDT}) \sim \text{scale}(\text{Reading skills}) * \text{Relatedness} + \text{scale}(\text{Reading skills}) * \text{Overlap} + \text{Overlap} * \text{Length} + \text{scale}(\text{Phonological skills}) + \text{RE}$					
Reading skills	0.51	1	47	17.11	< .001 ***
Phonological skills	0.010	1	47	0.32	.57

Final model selected: $\log_{10}(\text{FPDT}) \sim \text{scale}(\text{Reading skills}) + \text{Relatedness} + \text{Overlap} + \text{Length} + (\text{Length}|\text{Participant}) + (\text{Relatedness}|\text{Item})$



Model summary (p values from model comparison)

Fixed Effects						
	Est/Beta	SE	95% CI	df	t	Significance
Intercept	2.485	0.013	[2.459; 2.511]	80	189.85	<.0001
Relatedness	0.000	0.006	[-0.012; 0.012]	127	-0.01	$\chi^2(1) = 0, p = .99$
Overlap	-0.019	0.014	[-0.046; 0.009]	128	-1.33	$\chi^2(1) = 1.75, p = .19$
Length	0.016	0.014	[-0.012; 0.043]	124	1.11	$\chi^2(1) = 1.23, p = .27$
Reading skills (scaled)	-0.056	0.011	[-0.078; -0.034]	47	-5.05	$\chi^2(1) = 20.47, p < .001$ ***
Random Effects						
	Variance		S.D.		Correlation	

Item (Intercept)	0.006	0.074	
Relatedness (Item)	0.002	0.045	-0.04
Participant (Intercept)	0.006	0.077	
Length (Participant)	< .0001	0.006	0.45
Residual	0.030	0.17	
Model fit			
R ²	Marginal	Conditional	
	0.074	0.34	
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 5486; Nb of participants: 48; Nb of items: 128			

1.3.2 Dwell time

RANDOM EFFECT STRUCTURE REDUCTION

Data: log10 transformed

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap* Length slope	Intercept + Relatedness*Overlap * Length slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap * Length slope	Intercept + Relatedness, Overlap & Length slopes	Singular fit.					

Full_Reduced2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap + Length slope	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Length & Overlap slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Overlap*Length slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced6	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		

Full_Reduced7	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness & Length slopes	Singular fit.		
Full_Reduced8	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Overlap & Length slopes	Singular fit.		
Full_Reduced9	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced10	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced11	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Length slope	Singular fit.		

Full_Reduced_P1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept	Singular fit.		
Full_Reduced_P2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Length slopes	Intercept	Singular fit.		
Full_Reduced_P4	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Overlap & Length slopes	Intercept	Singular fit.		
Full_Reduced_P5	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness slope	Intercept	Converges.		

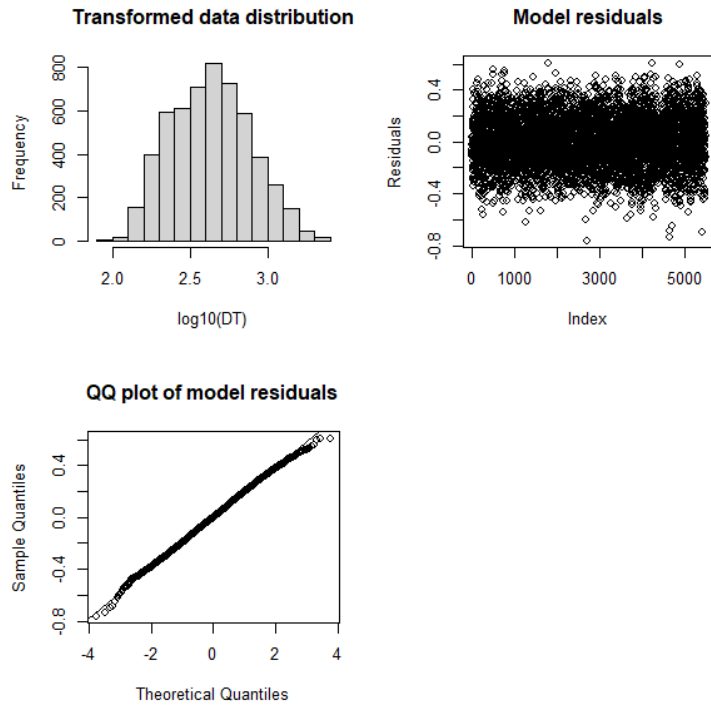
Full_Reduced_P6	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Overlap slope	Intercept	Singular.		
Full_Reduced_P7	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Length slope	Intercept	Converges.		
<i>No difference between full_reduced_p5 and p7 ($\chi^2(0) = 3.42$)</i>						
Full_Reduced_I1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness slope	Intercept + Relatedness slope	Converges.		
Full_Reduced_I2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness slope	Intercept + Overlap slope	Singular.		
Full_Reduced_I3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness slope	Intercept + Length slope	Singular.		

Final random-effects structure selected: (Length|Participants) + (Relatedness|Item)

FIXED-EFFECTS STRUCTURE REDUCTION with drop 1 (removing non-significant higher order interactions in descending order).

Model reduction					
	Sum Sq	df	Density df	F	<i>p</i>
scale(Reading skills):Relatedness:Overlap:Length	0.017	1	5150	0.43	.51
scale(Phonological skills):Relatedness:Overlap:Length	0.004	1	5157	0.10	.75
New model: $\log_{10}(\text{FPDT}) \sim (\text{scale}(\text{Reading skills}) + \text{Relatedness} + \text{Overlap} + \text{Length})^3 + (\text{scale}(\text{Phonological skills}) + \text{Relatedness} + \text{Overlap} + \text{Length})^3 + \text{RE}$					
Reading skills:Relatedness:Overlap	0.013	1	5150	0.33	.57
Reading skills:Relatedness:Length	0.025	1	5147	0.66	.42
Reading skills:Overlap:Length	0.001	1	5150	0.02	.89
Relatedness:Overlap:Length	0.004	1	126	0.11	.74
Relatedness:Overlap:Phonological skills	0.031	1	5158	0.80	.37
Relatedness:Length:Phonological skills	0.000	1	5157	0.01	.93
Overlap:Length: Phonological skills	0.006	1	5187	0.16	.69
New model: $\log_{10}(\text{FPDT}) \sim (\text{scale}(\text{Reading skills}) + \text{Relatedness} + \text{Overlap} + \text{Length})^2 + (\text{scale}(\text{Phonological skills}) + \text{Relatedness} + \text{Overlap} + \text{Length})^2 + \text{RE}$					
Reading skills:Relatedness	0.020	1	48	0.52	.47
Reading skills:Overlap	0.017	1	5148	0.45	.50
Reading skills:Length	0.001	1	5146	0.03	.87
Relatedness:Overlap	0.012	1	126	0.31	.58
Relatedness:Length	0.021	1	126	0.55	.46
Overlap:Length	0.104	1	127	2.70	.10
Phonological skills:Relatedness	0.007	1	49	0.19	.67
Phonological skills:Overlap	0.013	1	5186	0.33	.56
Phonological skills:Length	0.061	1	5187	1.59	.21
New model: $\log_{10}(\text{FPDT}) \sim \text{scale}(\text{Reading skills}) + \text{Relatedness} + \text{Overlap} + \text{Length} + \text{scale}(\text{Phonological skills}) + \text{RE}$					
Reading skills	0.017	1	48	0.43	.51
Phonological skills	0.061	1	48	1.58	.22

Final model selected: $\log_{10}(\text{FPDT}) \sim \text{Relatedness} + \text{Overlap} + \text{Length} + (\text{Relatedness}|\text{Participant}) + (\text{Relatedness}|\text{Item})$



Model summary (p values from model comparison)

Fixed Effects						
	Est/Beta	SE	95% CI	df	t	Significance
Intercept	2.622	0.022	[2.57; 2.66]	63	119.50	<.0001
Relatedness	-0.002	0.008	[-0.018; 0.014]	84	-0.23	$\chi^2(1) = 0.052, p = .82$
Overlap	-0.013	0.017	[-0.046; 0.020]	127	-0.76	$\chi^2(1) = 0.58, p = .45$
Length	0.003	0.017	[-0.030; 0.036]	127	0.19	$\chi^2(1) = 0.036, p = .85$
Random Effects						
	Variance		S.D.		Correlation	
Item (Intercept)	0.008		0.091			

Relatedness (Item)	0.004	0.067	-0.14
Participant (Intercept)	0.020	0.14	
Relatedness (Participant)	0.0001	0.012	-0.08
Residual	0.039	0.20	
Model fit			
R ²	Marginal	Conditional	
	0.001	0.43	
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 5476; Nb of participants: 48; Nb of items: 128			

1.3.3 Regression path duration

RANDOM EFFECT STRUCTURE REDUCTION

Data: log10 transformed

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap* Length slope	Intercept + Relatedness*Overlap * Length slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap * Length slope	Intercept + Relatedness, Overlap & Length slopes	Singular fit.					

Full_Reduced2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap + Length slope	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Length & Overlap slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Overlap*Length slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced6	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		

Full_Reduced7	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness & Length slopes	Singular fit.		
Full_Reduced8	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Overlap & Length slopes	Singular fit.		
Full_Reduced9	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced10	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced11	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Length slope	Singular fit.		

Full_Reduced_P1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept	Singular fit.		
Full_Reduced_P2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Length slopes	Intercept	Singular fit.		
Full_Reduced_P4	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Overlap & Length slopes	Intercept	Singular fit.		
Full_Reduced_P5	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness slope	Intercept	Converges.		

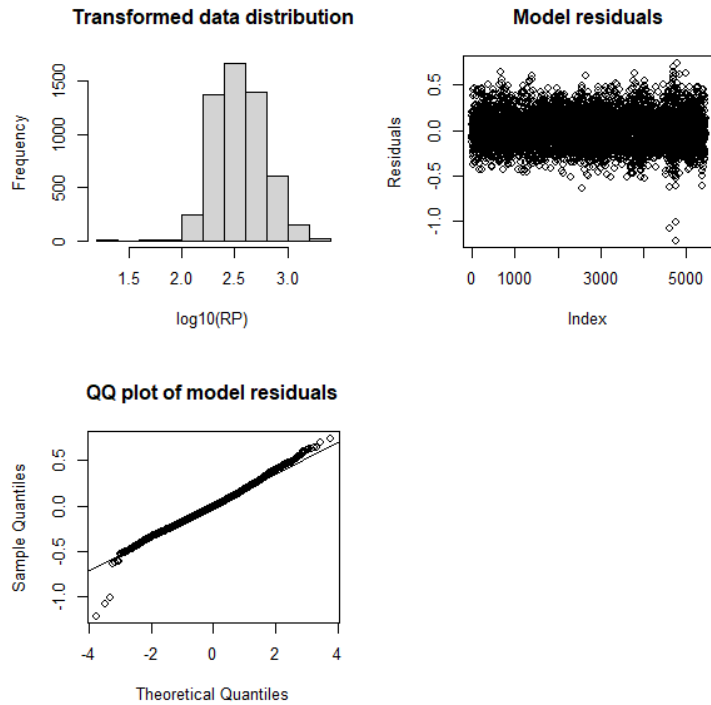
Full_Reduced_P6	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Overlap slope	Intercept	Singular fit.		
Full_Reduced_P7	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Length slope	Intercept	Singular fit.		
Full_Reduced_I1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness slope	Intercept + Relatedness slope	Converges.		
Full_Reduced_I2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness slope	Intercept + Overlap slope	Does not converge.		
Full_Reduced_I3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness slope	Intercept + Length slope	Does not converge.		

Final random-effects structure selected: (Relatedness|Participants) + (Relatedness|Item)

FIXED-EFFECTS STRUCTURE REDUCTION with drop 1 (removing non-significant higher order interactions in descending order).

Model reduction					
	Sum Sq	df	Density df	F	<i>p</i>
scale(Reading skills):Relatedness:Overlap:Length	0.026	1	5133	0.74	.39
scale(Phonological skills):Relatedness:Overlap:Length	0.001	1	5142	0.016	.90
New model: $\log_{10}(\text{FPDT}) \sim (\text{scale}(\text{Reading skills}) + \text{Relatedness} + \text{Overlap} + \text{Length})^3 + (\text{scale}(\text{Phonological skills}) + \text{Relatedness} + \text{Overlap} + \text{Length})^3 + \text{RE}$					
Reading skills:Relatedness:Overlap	0.003	1	5133	0.09	.76
Reading skills:Relatedness:Length	0.000	1	5132	0.01	.92
Reading skills:Overlap:Length	0.014	1	5131	0.39	.53
Relatedness:Overlap:Length	0.000	1	125	0.00	.99
Relatedness:Overlap:Phonological skills	0.015	1	5145	0.41	.52
Relatedness:Length:Phonological skills	0.000	1	5144	0.00	1.00
Overlap:Length: Phonological skills	0.002	1	5181	0.05	.82
New model: $\log_{10}(\text{FPDT}) \sim (\text{scale}(\text{Reading skills}) + \text{Relatedness} + \text{Overlap} + \text{Length})^2 + (\text{scale}(\text{Phonological skills}) + \text{Relatedness} + \text{Overlap} + \text{Length})^2 + \text{RE}$					
Reading skills:Relatedness	0.101	1	48	2.84	.098 .
Reading skills:Overlap	0.005	1	5132	0.14	.71
Reading skills:Length	0.026	1	5128	0.72	.40
Relatedness:Overlap	0.007	1	125	0.20	.66
Relatedness:Length	0.003	1	125	0.08	.78
Overlap:Length	0.140	1	128	3.95	.049 *
Phonological skills:Relatedness	0.010	1	49	0.29	.59
Phonological skills:Overlap	0.004	1	5180	0.12	.72
Phonological skills:Length	0.004	1	5181	0.12	.72
New model: $\log_{10}(\text{FPDT}) \sim \text{scale}(\text{Reading skills}) + \text{Relatedness} + \text{Overlap} * \text{Length} + \text{scale}(\text{Phonological skills}) + \text{RE}$					
Reading skills	0.28	1	47	7.97	.007 **
Phonological skills	0.019	1	47	0.54	.47

Final model selected: $\log_{10}(\text{FPDT}) \sim \text{scale}(\text{Reading skills}) + \text{Relatedness} + \text{Overlap} * \text{Length} + (\text{Relatedness} | \text{Participant}) + (\text{Relatedness} | \text{Item})$



Model summary (p values from model comparison)

Fixed Effects						
	Est/Beta	SE	95% CI	df	t	Significance
Intercept	2.536	0.015	[2.506; 2.565]	75	167.93	<.0001
Reading skills (scaled)	-0.047	0.013	[-0.072; -0.022]	47	-3.64	$\chi^2(1) = 11.08, p < .001$ ***
Relatedness	0.002	0.007	[-0.012; 0.016]	71	0.25	$\chi^2(1) = 0.063, p = .80$
Overlap	-0.015	0.015	[-0.044; 0.015]	128	-0.97	$\chi^2(1) = 0.90, p = .34$
Length	0.013	0.015	[-0.016; 0.043]	128	0.87	$\chi^2(1) = 0.74, p = .39$
Overlap:Length	0.060	0.030	[0.001; 0.120]	128	1.99	$\chi^2(1) = 3.89, p = .049$ *
Random Effects						

	Variance	S.D.	Correlation
Item (Intercept)	0.007	0.081	
Relatedness (Item)	0.003	0.052	-0.13
Participant (Intercept)	0.008	0.090	
Relatedness (Participant)	0.0002	0.014	0.49
Residual	0.036	0.19	
Model fit			
R ²	Marginal	Conditional	
	0.048	0.34	
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 5459; Nb of participants: 48; Nb of items: 128			

1.3.4 Regression rate

RANDOM EFFECT STRUCTURE REDUCTION

Data: log10 transformed

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap* Length slope	Intercept + Relatedness*Overlap * Length slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length	Intercept + Relatedness*Overlap * Length slope	Intercept + Relatedness, Overlap & Length slopes	Singular fit.					

	* Phonological skills					
Full_Reduced2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap + Length slope	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Length & Overlap slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Overlap*Length slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced6	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		

Full_Reduced7	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness & Length slopes	Singular fit.		
Full_Reduced8	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Overlap & Length slopes	Singular fit.		
Full_Reduced9	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced10	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced11	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Length slope	Singular fit.		

Full_Reduced_P1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept	Singular fit.		
Full_Reduced_P2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Length slopes	Intercept	Singular fit.		
Full_Reduced_P4	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Overlap & Length slopes	Intercept	Singular fit.		
Full_Reduced_P5	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness slope	Intercept	Singular fit.		

Full_Reduced_P6	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Overlap slope	Intercept	Singular fit.		
Full_Reduced_P7	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Length slope	Intercept	Singular fit.		
Full_Reduced_I1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept	Intercept + Relatedness slope	Singular.		
Full_Reduced_I2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept	Intercept + Overlap slope	Converges.		
Full_Reduced_I3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept	Intercept + Length slope	Does not converge.		

Final random-effects structure selected: (1|Participants) + (Overlap|Item)

FIXED-EFFECTS STRUCTURE REDUCTION with model comparison (removing non-significant higher order interactions in descending order). The significance of each term in the left column was evaluated by comparing a model without it to the model right above in the table.

Model name	Model reduction	Model reduction						
		npar	AIC	BIC	LL	df	χ^2	<i>p</i>
Full	Full model	28	3654	3840	-1799			
Reduced 1	Reading skills:Relatedness:Overlap:Length	27	3652	3832	-1799	1	0.30	.59
Reduced 2	Phonological skills:Relatedness:Overlap:Length	26	3651	3824	-1800	1	0.90	.34
Reduced 3	Phonological skills:Overlap:Length	25	3650	3816	-1800	1	1.14	.28
Reduced 4	Phonological skills:Relatedness:Length	24	3649	3808	-1800	1	0.28	.60
Reduced 5	Phonological skills:Relatedness:Overlap	23	3647	3799	-1800	1	0	1
<i>The model does not converge. The Overlap slope is removed.</i>								
Reduced 5b	Phonological skills:Relatedness:Overlap	21	3643	3782	-1801			
Reduced 6	Relatedness:Overlap:Length	20	3642	3775	-1801	1	1.29	.26
Reduced 7	Reading skills:Overlap:Length	19	3641	3767	-1801	1	0.44	.51
Reduced 8	Reading skills:Relatedness:Length	18	3642	3761	-1803	1	3.24	.072 .
<i>This interaction is retained in the model. The following model is therefore compared to model Reduced 7.</i>								
Reduced 9	Reading skills:Relatedness:Overlap	18	3639	3659	-1802	1	0.44	.51
Reduced 10	Phonological skills: Length	17	3638	3751	-1802	1	0.60	.44
Reduced 11	Phonological skills:Overlap	16	3639	3745	-1804	1	3.44	.064 .
<i>This interaction is retained in the model. The following model is therefore compared to model Reduced 10.</i>								
Reduced 12	Phonological skills:Relatedness	16	3637	3743	-1802	1	1.06	.30
Reduced 13	Overlap:Length	15	3641	3741	-1806	1	6.15	.013 *
<i>This interaction is retained in the model. The following model is therefore compared to model Reduced 12</i>								
Reduced 14	Relatedness:Overlap	15	3637	3637	-1804	1	2.55	.11
Reduced 15	Reading skills:Overlap	14	3638	3731	-1805	1	2.69	.10

Final model selected Reg_out ~ scale(Reading skills)+Relatedness+Overlap+Length + scale(Phonological skills)+ scale(Reading skills): Relatedness + scale(Reading skills):Length + Relatedness:Length+ Overlap:Length + scale(Phonological skills): Overlap + scale(Reading skills):Relatedness:Length+ (1|Subject) + (1|Item), family = binomial(link = "logit").

Model summary (*p* values from model comparison)

Fixed Effects

	Est/Beta	SE	95% CI	z	Significance
Intercept	-2.426	0.134	[-2.689; -2.164]	-18.12	<.0001
Reading skills (scaled)	0.187	0.142	[-0.092; 0.466]	1.31	$\chi^2(1) = 2.37, p = .12$
Relatedness	0.042	0.089	[-0.132; 0.216]	0.47	$\chi^2(1) = 0.19, p = .66$
Overlap	0.062	0.117	[-0.168; 0.292]	0.53	$\chi^2(1) = 0.23, p = .63$
Length	-0.161	0.118	[-0.391; 0.070]	-1.36	$\chi^2(1) = 1.82, p = .18$
Phonological skills (scaled)	0.017	0.143	[-0.263; 0.297]	0.12	$\chi^2(1) = 0.014, p = .91$
Reading skills: Relatedness	-0.066	0.091	[-0.245; 0.113]	-0.72	$\chi^2(1) = 0.43, p = .51$
Reading skills: Length	-0.100	0.091	[-0.279; 0.079]	-1.09	$\chi^2(1) = 1.08, p = .30$
Relatedness: Length	0.016	0.178	[-0.333; 0.364]	0.09	$\chi^2(1) = 0.024, p = .88$
Overlap:Length	0.602	0.234	[0.143; 1.062]	2.57	$\chi^2(1) = 6.24, p = .13^*$
Overlap: Phonological skills	0.119	0.093	[-0.064; 0.302]	1.28	$\chi^2(1) = 1.54, p = .21$
Relatedness: Length: Reading skills	-0.357	0.183	[-0.716; 0.002]	-1.95	$\chi^2(1) = 3.66, p = .056$
Random Effects					
	Variance		S.D.		Correlation
Item (Intercept)	0.18		0.43		
Participant (Intercept)	0.63		0.80		
Model fit					
R ² (theoretical)	Marginal			Conditional	
	0.020			0.21	
R ² (delta)	Marginal			Conditional	
	0.008			0.081	
Key: p-values for fixed effects calculated using Satterthwaite's approximations.					
Confidence Intervals have been calculated using the Wald method.					
Nb observations: 5628; Nb of participants: 48; Nb of items: 128					

1.3.5 Skipping rate

RANDOM EFFECT STRUCTURE REDUCTION

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit	LRT Test against nested
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				AIC	BIC	LL	npar	df	X ²	
Full	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap* Length slope	Intercept + Relatedness*Overlap * Length slope	Singular fit.						
Full_Reduced1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap * Length slope	Intercept + Relatedness, Overlap & Length slopes	Singular fit.						
Full_Reduced2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Overlap + Length slope	Intercept + Relatedness, Overlap & Length slopes	Singular fit.						
Full_Reduced3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness*Length & Overlap slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.						
Full_Reduced4	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Overlap*Length slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.						

Full_Reduced5	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness, Overlap & Length slopes	Singular fit.		
Full_Reduced6	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		
Full_Reduced7	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness & Length slopes	Singular fit.		
Full_Reduced8	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Overlap & Length slopes	Singular fit.		
Full_Reduced9	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Relatedness slope	Singular fit.		

Full_Reduced10	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced11	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept + Length slope	Singular fit.		
Full_Reduced_P1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness, Overlap & Length slopes	Intercept	Singular fit.		
Full_Reduced_P2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness & Length slopes	Intercept	Converges		

Full_Reduced_P4	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Overlap & Length slopes	Intercept	Singular fit.		
Full_Reduced_P5	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Relatedness slope	Intercept	Singular fit.		
Full_Reduced_P6	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Overlap slope	Intercept	Singular fit.		
Full_Reduced_P7	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept + Length slope	Intercept	Singular fit.		
Full_Reduced_I1	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept	Intercept + Relatedness slope	Converges.		

Full_Reduced_I2	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept	Intercept + Overlap slope	Does not converge.					
Full_Reduced_I3	Relatedness * Overlap * Length * Reading skills + Relatedness * Overlap * Length * Phonological skills	Intercept	Intercept + Length slope	Converges.					
<i>We compare models Full_Reduced_I2 and Full_Reduced_I3</i>				AIC	BIC	LL	npar	Df	X ²
Full_Reduced_I1	<i>See above</i>	Intercept	Intercept + Relatedness slope	3067	3255	-1505	28		
Full_Reduced_I2	<i>See above</i>	Intercept	Intercept + Overlap slope	3067	3255	-1505	28	0	0
Full_Reduced_I3	<i>See above</i>	Intercept	Intercept + Length slope	3067	3255	-1505	28	0	0.24

Final random-effects structure selected: (1|Participants) + (Relatedness|Item)

FIXED-EFFECTS STRUCTURE REDUCTION with model comparison (removing non-significant higher order interactions in descending order). The significance of each term in the left column was evaluated by comparing a model without it to the model right above in the table.

Model name	Model reduction	Model reduction						
		npar	AIC	BIC	LL	df	χ^2	<i>p</i>
Full	Full model	28	3067	3255	-1505	1		
Reduced 1	Reading skills:Relatedness:Overlap:Length	27	3066	3248	-1506	1	1.58	.21
Reduced 2	Phonological skills:Relatedness:Overlap:Length	26	3065	3240	-1506	1	0.53	.46
Reduced 3	Phonological skills:Overlap:Length	25	3064	3232	-1507	1	1.06	.30
Reduced 4	Phonological skills:Relatedness:Length	24	3065	3226	-1508	1	2.64	.10
Reduced 5	Phonological skills:Relatedness:Overlap	23	3063	3218	-1509	1	0.55	.46
Reduced 6	Relatedness:Overlap:Length	22	3061	3209	-1509	1	0.09	.76

Reduced 7	Reading skills:Overlap:Length	21	3059	3200	-1509	1	0.05	.83
Reduced 8	Reading skills:Relatedness:Length	20	3058	3192	-1509	1	0.21	.65
Reduced 9	Reading skills:Relatedness:Overlap	19	3060	3188	-1511	1	4.54	.033 *
<i>The interaction is retained in the model. The next model is compared to model Reduced 8.</i>								
Reduced 10	Phonological skills: Length	19	3056	3183	-1509	1	0.17	.68
Reduced 11	Phonological skills:Overlap	18	3054	3175	-1509	1	0.77	.38
Reduced 12	Phonological skills:Relatedness	17	3053	3167	-1509	1	0.46	.50
Reduced 13	Overlap:Length	16	3053	3161	-1511	1	2.25	.13
Reduced 14	Relatedness:Length	15	3051	3152	-1511	1	0.001	.97
Reduced 15	Reading skills:Length	14	3049	3143	-1511	1	0.14	.71
Reduced 16	Phonological skills	13	3047	3135	-1511	1	0.04	.84

Final model selected: Skips ~ scale(Reading skills)+Relatedness+Overlap+Length +scale(Reading skills):Relatedness+ scale(Reading skills):Overlap + Relatedness:Overlap + scale(Reading skills):Relatedness:Overlap + (1|Subject) + (Relatedness|Item), family = binomial(link = "logit").

Model summary (*p* values from model comparison)

Fixed Effects					
	Est/Beta	SE	95% CI	z	Significance
Intercept	-3.00	0.20	[-3.40; -2.60]	-14.65	<.0001 ***
Reading skills (scaled)	0.41	0.16	[0.09; 0.73]	2.49	$\chi^2(1) = 5.75, p = .017 *$
Relatedness	0.05	0.12	[-0.19; 0.29]	0.43	$\chi^2(1) = 0.15, p = .69$
Overlap	0.01	0.18	[-0.34; 0.36]	0.04	$\chi^2(1) = 0.01, p = .93$
Length	-0.24	0.18	[-0.58; 0.11]	-1.34	$\chi^2(1) = 1.76, p = .19$
Reading skills: Relatedness	0.02	0.09	[-0.17; 0.20]	0.20	$\chi^2(1) = 0.07, p = .79$
Reading skills: Overlap	-0.10	0.09	[-0.28; 0.09]	-1.03	$\chi^2(1) = 0.98, p = .32$
Relatedness: Overlap	-0.09	0.20	[-0.49; 0.31]	-0.44	$\chi^2(1) = 0.01, p = .94$
Reading skills: Relatedness: Overlap	0.41	0.19	[0.04; 0.78]	2.20	$\chi^2(1) = 4.55, p = .033 *$
Random Effects					
	Variance	S.D.	Correlation		
Item (Intercept)	0.64	0.80			
Relatedness (Item)	0.04	0.20	0.02		
Participant (Intercept)	1.12	1.06			

Model fit		
R ² (theoretical)	Marginal	Conditional
	0.038	0.37
R ² (delta)	Marginal	Conditional
	0.013	0.13
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 6138; Nb of participants: 48; Nb of items: 128		

2. SHORT LENGTH

2.1 Target

2.1.1 First pass dwell time

RANDOM EFFECT STRUCTURE REDUCTION

Data: log10 transformed

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness*Overlap slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Reading skills + Relatedness * Overlap *	Intercept + Relatedness*Overlap slope	Intercept + Relatedness & Overlap slopes	Singular fit.					

	Phonological skills					
Full_Reduced2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		
Full_Reduced3	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P1	Relatedness * Overlap *	Intercept + Relatedness slope	Intercept	Singular fit.		

	Reading skills + Relatedness * Overlap * Phonological skills					
Full_Reduced_P2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept	Singular fit.		
FullFE	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept	Intercept	Converges.		
Full_Reduced_I1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept	Intercept + Relatedness slope	Singular.		
Full_Reduced_I2	Relatedness * Overlap * Reading skills + Relatedness * Overlap *	Intercept	Intercept + Overlap slope	Does not converge.		

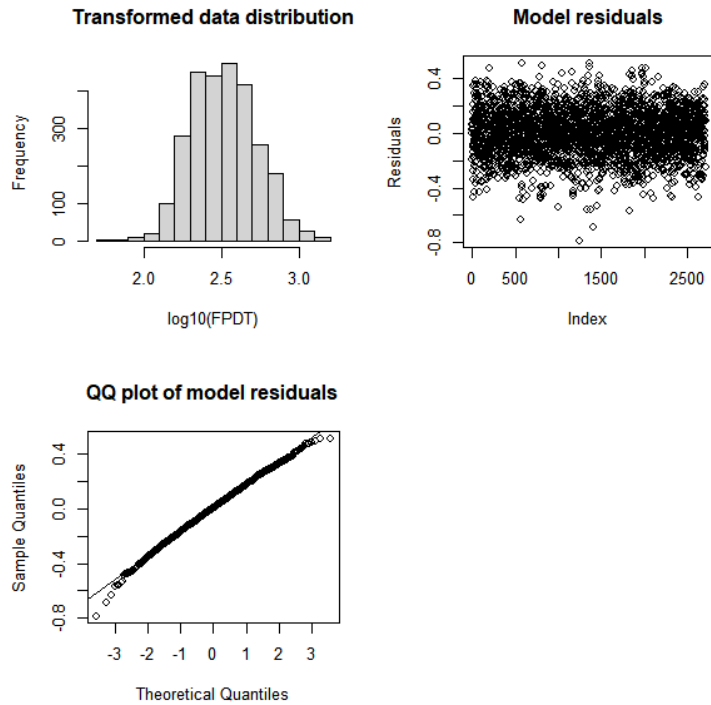
	Phonological skills					
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Final random-effects structure selected: (1|Participants) + (1|Item)

FIXED-EFFECTS STRUCTURE REDUCTION with drop 1 (removing non-significant higher order interactions in descending order).

Model reduction					
	Sum Sq	df	Density df	F	<i>p</i>
Reading skills:Relatedness:Overlap	0.063	1	2598	2.08	.15
Phonological skills:Relatedness:Overlap	0.042	1	2604	1.39	.24
New model: log10(FPDT) ~ (Relatedness + Overlap + scale(Reading skills))^2 + (Relatedness + Overlap + scale(Phonological skills))^2 + RE					
Reading skills:Relatedness	0.16	1	2597	0.52	.47
Reading skills:Overlap	0.0001	1	2597	0.004	.95
Relatedness:Overlap	0.13	1	2597	4.25	.039
Phonological skills: Relatedness	0.001	1	2605	0.04	.84
Phonological skills: Overlap	0.006	1	2596	0.20	.66
New model: log10(FPDT) ~ scale(Reading skills) + Relatedness * Overlap + scale(Phonological skills) + RE					
Reading skills	0.34	1	47	11.26	.002
Phonological skills	0.024	1	47	0.77	.39
Relatedness:Overlap	0.13	1	2597	4.25	.039

Final model selected: log10(FPDT) ~ scale (Reading skills) + Relatedness * Overlap + (1|Participant) + (1|Item)



Model summary (p values from model comparison)

Fixed Effects						
	Est/Beta	SE	95% CI	df	t	Significance
Intercept	2.51	0.014	2.48; 2.54	86	174.09	<.0001
Reading skills (scaled)	-0.049	0.011	-0.071; -0.026	47	-4.30	$\chi^2(1) = 15.70, p < .001$
Relatedness	-0.00022	0.007	-0.013; 0.013	2597	-0.03	$\chi^2(1) = 0.006, p = .94$
Overlap	-0.035	0.019	-0.07; 0.002	63	-1.87	$\chi^2(1) = 3.40, p = .065$
Relatedness*Overlap	-0.028	0.013	-0.054; -0.001	2597	-2.06	$\chi^2(1) = 4.25, p = .039$
Random Effects						
	Variance	S.D.		Correlation		

Item (Intercept)	0.005	0.069	
Participant (Intercept)	0.006	0.076	
Residual	0.031	0.17	
Model fit			
R ²	Marginal	Conditional	
	0.062	0.30	
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 2708; Nb of participants: 48; Nb of items: 64			

FOLLOW-UP TEST for RELATEDNESS*OVERLAP?

2.1.2 Dwell time

RANDOM EFFECT STRUCTURE REDUCTION

Data: log10 transformed

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness*Overlap slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness & Overlap slopes	Singular fit.					

Full_Reduced2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		
Full_Reduced3	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P1	Relatedness * Overlap * Reading skills +	Intercept + Relatedness slope	Intercept	Converges		

	Relatedness * Overlap * Phonological skills					
Full_Reduced_P2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept	Singular fit.		
Full_Reduced_I1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness slope	Intercept + Relatedness slope	Converges.		
Full_Reduced_I2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness slope	Intercept + Overlap slope	Does not converge.		

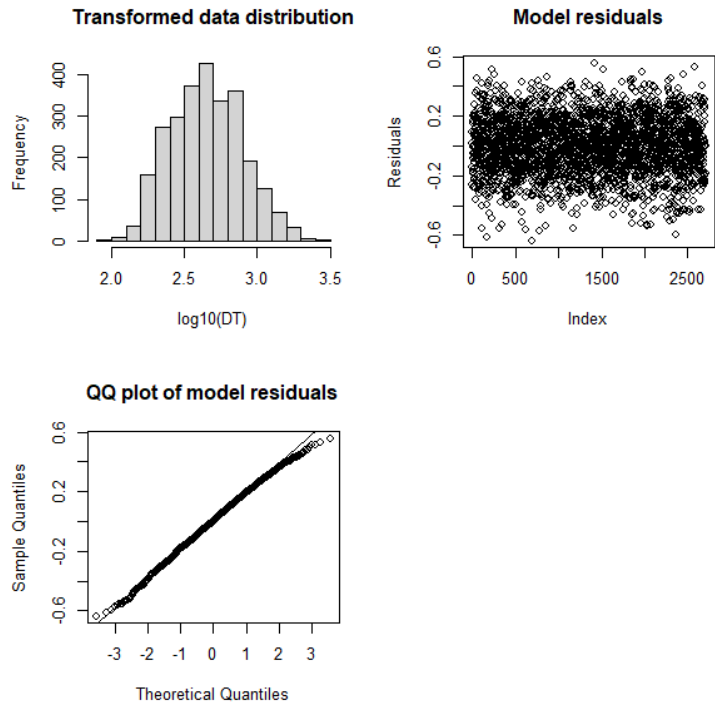
Final random-effects structure selected: (Relatedness|Participant) + (Relatedness|Item)

FIXED-EFFECTS STRUCTURE REDUCTION with drop 1 (removing non-significant higher order interactions in descending order).

Model reduction					
	Sum Sq	df	Density df	F	<i>p</i>
Reading skills:Relatedness:Overlap	0.021	1	2500	0.57	.45

Phonological skills:Relatedness:Overlap	0.038	1	2500	1.04	.31
New model: $\log_{10}(\text{FPDT}) \sim (\text{Relatedness} + \text{Overlap} + \text{scale}(\text{Reading skills}))^2 + (\text{Relatedness} + \text{Overlap} + \text{scale}(\text{Phonological skills}))^2 + \text{RE}$					
Reading skills:Relatedness	0.087	1	45	2.37	.13
Reading skills:Overlap	0.017	1	2500	0.47	.49
Relatedness:Overlap	0.071	1	61	1.92	.17
Phonological skills: Relatedness	0.028	1	46	0.76	.39
Phonological skills: Overlap	0.002	1	2534	0.06	.80
New model: $\log_{10}(\text{FPDT}) \sim \text{scale}(\text{Reading skills}) + \text{Relatedness} + \text{Overlap} + \text{scale}(\text{Phonological skills}) + \text{RE}$					
Reading skills	0.025	1	47	0.68	.42
Phonological skills	0.063	1	47	1.70	.20
Relatedness	0.048	1	32	1.30	.26
Overlap	0.14	1	63	3.73	.058

Final model selected: $\log_{10}(\text{DT}) \sim \text{Relatedness} + \text{Overlap} + (\text{Relatedness}|\text{Participant}) + (\text{Relatedness}|\text{Item})$



Model summary (p values from model comparison)

Fixed Effects						
	Est/Beta	SE	95% CI	df	t	Significance
Intercept	2.65	0.023	2.60; 2.69	76	116.42	<.0001
Relatedness	0.010	0.008	-0.007; 0.026	32	1.15	$\chi^2(1) = 1.29, p = .26$
Overlap	-0.05	0.024	-0.093; 0.0007	63	-1.93	$\chi^2(1) = 3.51, p = .06$
Random Effects						
	Variance		S.D.		Correlation	
Item (Intercept)	0.008		0.091			
Relatedness (Item)	0.0005		0.022		0.41	

Participant (Intercept)	0.018	0.13	
Relatedness (Participant)	0.004	0.019	-0.14
Residual	0.037	0.19	
Model fit			
R ²	Marginal	Conditional	
	0.009	0.42	
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 2705; Nb of participants: 48; Nb of items: 64			

2.1.3 Regression path duration

RANDOM EFFECT STRUCTURE REDUCTION

Data: log10 transformed

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness*Overlap slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness & Overlap slopes	Singular fit.					

Full_Reduced2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		
Full_Reduced3	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P1	Relatedness * Overlap * Reading skills +	Intercept + Relatedness slope	Intercept	Singular fit.		

	Relatedness * Overlap * Phonological skills					
Full_Reduced_P2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept	Singular fit.		
Full_Reduced_I1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept	Intercept + Relatedness slope	Converges.		
Full_Reduced_I2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept	Intercept + Overlap slope	Does not converge.		

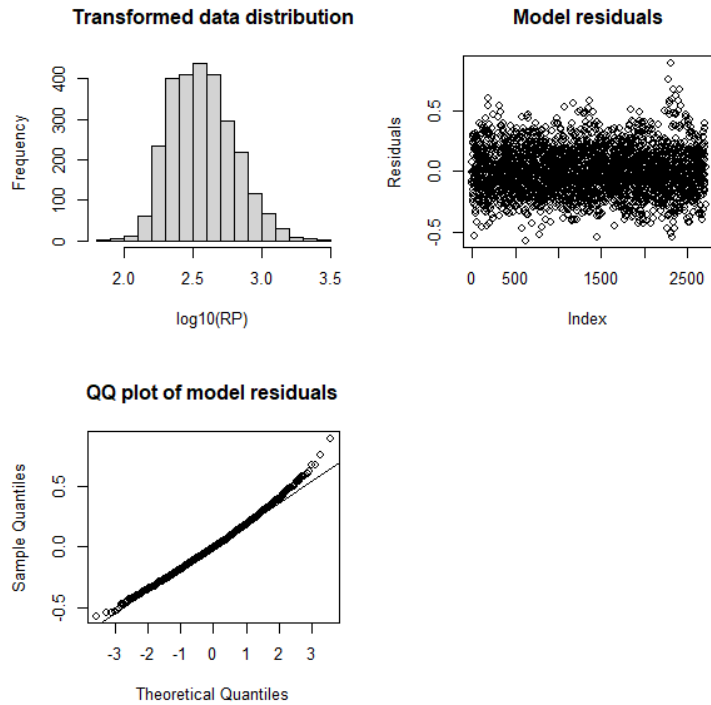
Final random-effects structure selected: (1|Participant) + (Relatedness|Item)

FIXED-EFFECTS STRUCTURE REDUCTION with drop 1 (removing non-significant higher order interactions in descending order).

Model reduction					
	Sum Sq	df	Density df	F	<i>p</i>
Reading skills:Relatedness:Overlap	0.092	1	2552	2.52	.11

Phonological skills:Relatedness:Overlap	0.023	1	2555	0.63	.43
New model: $\log_{10}(\text{FPDT}) \sim (\text{Relatedness} + \text{Overlap} + \text{scale}(\text{Reading skills}))^2 + (\text{Relatedness} + \text{Overlap} + \text{scale}(\text{Phonological skills}))^2 + \text{RE}$					
Reading skills:Relatedness	0.008	1	2552	0.22	.64
Reading skills:Overlap	0.061	1	2550	1.67	.20
Relatedness:Overlap	0.015	1	63	0.42	.52
Phonological skills: Relatedness	0.021	1	2555	0.57	.45
Phonological skills: Overlap	0.035	1	2581	0.95	.33
New model: $\log_{10}(\text{FPDT}) \sim \text{scale}(\text{Reading skills}) + \text{Relatedness} + \text{Overlap} + \text{scale}(\text{Phonological skills}) + \text{RE}$					
Reading skills	0.29	1	46	7.92	.007 **
Phonological skills	0.008	1	47	0.21	.65
Relatedness	0.006	1	64	0.16	.69
Overlap	0.17	1	63	4.54	.037 *

Final model selected: $\log_{10}(\text{DT}) \sim \text{scale}(\text{Reading skills}) + \text{Relatedness} + \text{Overlap} + (1|\text{Participant}) + (\text{Relatedness}|\text{Item})$



Model summary (p values from model comparison)

Fixed Effects						
	Est/Beta	SE	95% CI	df	t	Significance
Intercept	2.56	0.017	2.53; 2.59	88	151	<.0001
Reading skills	-0.046	0.013	-0.072; -0.20	47	-3.47	$\chi^2(1) = 10.80, p = .001^{**}$
Relatedness	0.0033	0.008	-0.013; 0.019	64	0.41	$\chi^2(1) = 0.16, p = .69$
Overlap	-0.047	0.022	-0.089; -0.004	63	-2.13	$\chi^2(1) = 4.36, p = .037^*$
Random Effects						
	Variance		S.D.		Correlation	
Item (Intercept)	0.007		0.082			

Relatedness (Item)	0.0008	0.029	-0.14
Participant (Intercept)	0.008	0.090	
Residual	0.037	0.19	
Model fit			
R ²	Marginal	Conditional	
	0.049	0.32	
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 2712; Nb of participants: 48; Nb of items: 64			

2.1.4 Regression rate

RANDOM EFFECT STRUCTURE REDUCTION

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness*Overlap slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness & Overlap slopes	Singular fit.					
Full_Reduced2	Relatedness * Overlap *	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness & Overlap slopes	Singular fit.					

	Reading skills + Relatedness * Overlap * Phonological skills					
Full_Reduced3	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P1	Relatedness * Overlap * Reading skills + Relatedness * Overlap *	Intercept + Relatedness slope	Intercept	Singular fit.		

	Phonological skills					
Full_Reduced_P2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept	Converges.		
Full_Reduced_I1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept + Relatedness slope	Singular fit.		
Full_Reduced_I2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept + Overlap slope	Converges.		

Final random-effects structure selected: (Overlap|Participants) + (Overlap |Item)

FIXED-EFFECTS STRUCTURE REDUCTION with model comparison (removing non-significant higher order interactions in descending order). The significance of each term in the left column was evaluated by comparing a model without it to the model right above in the table.

Model name	Model reduction	Model reduction						
		npar	AIC	BIC	LL	df	χ^2	<i>p</i>
Full	Full model	18	1835	1942	-899.26			
Reduced 1	Reading skills:Relatedness:Overlap	17	1833	1941	-899.26	1	0.79	.37

Reduced 2	Phonological skills:Relatedness:Overlap	16	1831	1926	-899.66	1	.0093	.92
Reduced 3	Phonological skills: Overlap	15	1830	1919	-900.08	1	0.86	.35
Reduced 4	Phonological skills: Relatedness	14	1834	1917	-902.94	1	5.71	.017 *
<i>This interaction is retained in the model. The following model is therefore compared to model Reduced 3, which includes the Phonological skills: Relatedness interaction.</i>								
Reduced 5	Reading skills:Overlap	14	1829	1912	-900.55	1	0.94	.33
Reduced 6	Reading skills:Relatedness	13	1827	1905	-900.71	1	0.33	.57
Reduced 7	Relatedness:Overlap	The model does not converge without the Relatedness: Overlap interaction. The Overlap slope per item is removed. A model 6b is computed without the overlap slope per item as well and those two models are compared.						
Reduced 6b	(without Reading skills:Relatedness, without Overlap slope per item)	11	1825	1891	-901.69	1		
Reduced 7b	Relatedness:Overlap (no Overlap slope per item)	10	1825	1884	-902.49	1	1.60	.21
Reduced 8b	Reading skills (no Overlap sloper per item)	9	1824	1878	-903.18	1	1.38	.24

Final model selected: Reg_out ~ scale (Phonological skills) + Relatedness + Overlap + scale (Phonological skills) : Relatedness + (Overlap | Participant) + (1 | Item), family = binomial(link = "logit").

Model summary (p values from model comparison)

Fixed Effects					
	Est/Beta	SE	95% CI	z	Significance
Intercept	-2.46	0.15	-2.75; -2.16	-16.28	<.0001
Phonological skills (scaled)	0.19	0.13	-0.062; 0.44	1.47	$\chi^2(1) = 2.02, p = .16$
Relatedness	0.023	0.13	-0.23; 0.27	0.18	$\chi^2(1) = 0.29, p = .59$
Overlap	-0.30	0.21	-0.72; 0.11	-1.45	$\chi^2(1) = 1.98, p = .16$
Phonological skills: Relatedness	0.42	0.14	0.14; 0.70	2.90	$\chi^2(1) = 8.22, p = .0041 **$
Random Effects					
	Variance	S.D.	Correlation		
Item (Intercept)	0.34	0.59			
Participant (Intercept)	0.51	0.71			
Overlap (Participant)	0.01	0.11	0.06		

Model fit		
R ² (theoretical)	Marginal	Conditional
	0.024	0.23
R ² (delta)	Marginal	Conditional
	0.0090	0.084
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 2812; Nb of participants: 48; Nb of items: 64		

2.1.5 Skipping rate

RANDOM EFFECT STRUCTURE REDUCTION

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness*Overlap slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness & Overlap slopes	Singular fit.					
Full_Reduced2	Relatedness * Overlap * Reading skills +	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness & Overlap slopes	Singular fit.					

	Relatedness * Overlap * Phonological skills					
Full_Reduced3	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness slope	Intercept	Singular fit.		

Full_Reduced_P2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept	Singular fit.		
Full_Reduced_I1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept	Intercept + Relatedness slope	Singular fit.		
Full_Reduced_I2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept	Intercept + Overlap slope	Converges.		

Final random-effects structure selected: (1|Participants) + (1 |Item)

FIXED-EFFECTS STRUCTURE REDUCTION with model comparison (removing non-significant higher order interactions in descending order). The significance of each term in the left column was evaluated by comparing a model without it to the model right above in the table.

Model name	Model reduction	Model reduction						
		npar	AIC	BIC	LL	df	χ^2	<i>p</i>
Full	Full model	16	1543	1640	-755.61			
Reduced 1	Reading skills:Relatedness:Overlap	15	1541	1632	-755.63	1	0.045	.83
Reduced 2	Phonological skills:Relatedness:Overlap	14	1540	1625	-756.05	1	0.84	.36
Reduced 3	Phonological skills: Overlap	13	1539	1617	-756.28	1	0.46	.50

Reduced 4	Phonological skills: Relatedness	12	1537	1610	-756.70	1	0.84	.36
Reduced 5	Reading skills:Overlap	11	1537	1603	-757.31	1	1.23	.27
Reduced 6	Reading skills:Relatedness	10	1535	1596	-757.34	1	0.067	.80
Reduced 7	Relatedness:Overlap	9	1534	1588	-757.87	1	1.05	.31
Reduced 8	Phonological skills	8	1532	1580	-757.88	1	0.026	.87
Reduced 9	Reading skills	7	1534	1576	-759.94	1	4.11	.043

Final model selected: Skips ~ Relatedness + Overlap + scale (Reading skills) + (1 |Participant) + (Overlap | Item), family = binomial(link = "logit").

Model summary (*p* values from model comparison)

Fixed Effects					
	Est/Beta	SE	95% CI	z	Significance
Intercept	-3.15	0.22	-3.58; -2.73	-14.52	<.0001
Reading skills (scaled)	0.35	0.17	0.021; 0.67	2.09	$\chi^2(1) = 4.11, p = .043$
Relatedness	0.049	0.14	-0.22; 0.32	0.36	$\chi^2(1) = 0.13, p = .73$
Overlap	-0.41	0.29	-0.98; 0.16	-1.40	$\chi^2(1) = 1.89, p = .17$
Random Effects					
	Variance	S.D.	Correlation		
Item (Intercept)	0.59	0.77			
Overlap (Item)	1.12	1.06	0.09		
Participant (Intercept)	1.04	1.02			
Model fit					
R ² (theoretical)	Marginal			Conditional	
	0.030			0.39	
R ² (delta)	Marginal			Conditional	
	0.011			0.13	
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 3068; Nb of participants: 48; Nb of items: 64					

2.2 Spillover

2.2.1 First pass dwell time

RANDOM EFFECT STRUCTURE REDUCTION

Data: log10 transformed

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness*Overlap slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness & Overlap slopes	Singular fit.					
Full_Reduced2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness & Overlap slopes	Singular fit.					
Full_Reduced3	Relatedness * Overlap * Reading skills +	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness slope	Singular fit.					

	Relatedness * Overlap * Phonological skills					
Full_Reduced4	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness slope	Intercept	Converges		
Full_Reduced_P2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept	Singular fit.		

Full_Reduced_I1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness slope	Intercept + Relatedness slope	Converges.		
Full_Reduced_I2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness slope	Intercept + Overlap slope	Does not converge.		

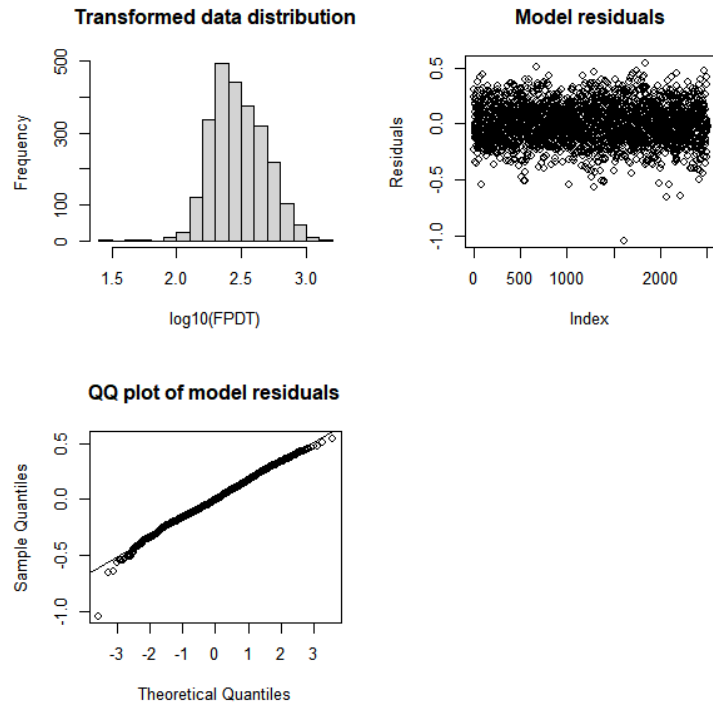
Final random-effects structure selected: (Relatedness|Participants) + (Relatedness |Item)

FIXED-EFFECTS STRUCTURE REDUCTION with drop 1 (removing non-significant higher order interactions in descending order).

Model reduction					
	Sum Sq	df	Density df	F	<i>p</i>
Reading skills:Relatedness:Overlap	0.010	1	2352	0.35	.56
Phonological skills:Relatedness:Overlap	0.020	1	2348	0.66	.42
New model: $\log_{10}(\text{FPDT}) \sim (\text{Relatedness} + \text{Overlap} + \text{scale}(\text{Reading skills}))^2 + (\text{Relatedness} + \text{Overlap} + \text{scale}(\text{Phonological skills}))^2 + \text{RE}$					
Reading skills:Relatedness	0.044	1	49	1.46	.23
Reading skills:Overlap	0.014	1	2349	0.47	.49
Relatedness:Overlap	0.043	1	64	1.43	.24
Phonological skills: Relatedness	0.048	1	54	1.60	.21
Phonological skills: Overlap	0.00008	1	2376	0.003	.96
New model: $\log_{10}(\text{FPDT}) \sim \text{scale}(\text{Reading skills}) + \text{Relatedness} * \text{Overlap} + \text{scale}(\text{Phonological skills}) + \text{RE}$					
Reading skills	0.52	1	48	17.00	.0001 ***
Relatedness	0.007	1	34	0.22	.64
Overlap	0.014	1	63	0.45	.50

Phonological skills	0.005	1	49	0.17	.68
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Final model selected: $\log_{10}(\text{FPDT}) \sim \text{scale}(\text{Reading skills}) + \text{Relatedness} * \text{Overlap} + (\text{Relatedness} | \text{Participant}) + (\text{Relatedness} | \text{Item})$



Model summary (*p* values from model comparison)

Fixed Effects						
	Est/Beta	SE	95% CI	df	t	Significance
Intercept	2.47	0.013	2.44; 2.49	94	185	<.0001
Reading skills (scaled)	-0.047	0.009	-0.066; -0.028	48	-4.93	$\chi^2(1) < .0001$ ***
Relatedness	0.0038	0.008	-0.012; 0.020	34	0.48	$\chi^2(1) = .64$
Overlap	-0.013	0.020	-0.051; 0.025	63	-0.67	$\chi^2(1) = .50$

Random Effects			
	Variance	S.D.	Correlation
Item (Intercept)	0.005	0.073	
Relatedness (Item)	0.0002	0.015	0.14
Participant (Intercept)	0.004	0.062	
Relatedness (Participant)	0.0006	0.025	-0.08
Residual	0.030	0.17	
Model fit			
R ²	Marginal	Conditional	
	0.055	0.28	
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 2510; Nb of participants: 48; Nb of items: 64			

2.2.2 Dwell time

RANDOM EFFECT STRUCTURE REDUCTION

Data: log10 transformed

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness*Overlap slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Reading skills +	Intercept + Relatedness*Overlap slope	Intercept + Relatedness & Overlap slopes	Singular fit.					

	Relatedness * Overlap * Phonological skills					
Full_Reduced2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		
Full_Reduced3	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		

Full_Reduced_P1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness slope	Intercept	-800.87	-701.82	417.43	17		
Full_Reduced_P2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept	-800.93	-701.88	417.46	17	0	0.059
No significant difference. We continue with model Full_Reduced_P1 with a Relatedness slope per participant.									
Full_Reduced_I1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness slope	Intercept + Relatedness slope	Compared to: Full_Reduced_P1					
				-801.40	-690.70	419.70	19	2	4.53, $p = .10$
Full_Reduced_I2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness slope	Intercept + Overlap slope	Compared to: Full_Reduced_I1					
				-796.9	-686.2	417.45	19	0	0
Full_Reduced_I3	Relatedness * Overlap * Reading skills +	Intercept + Relatedness slope	Intercept + Relatedness & Overlap slope	Does not converge.					

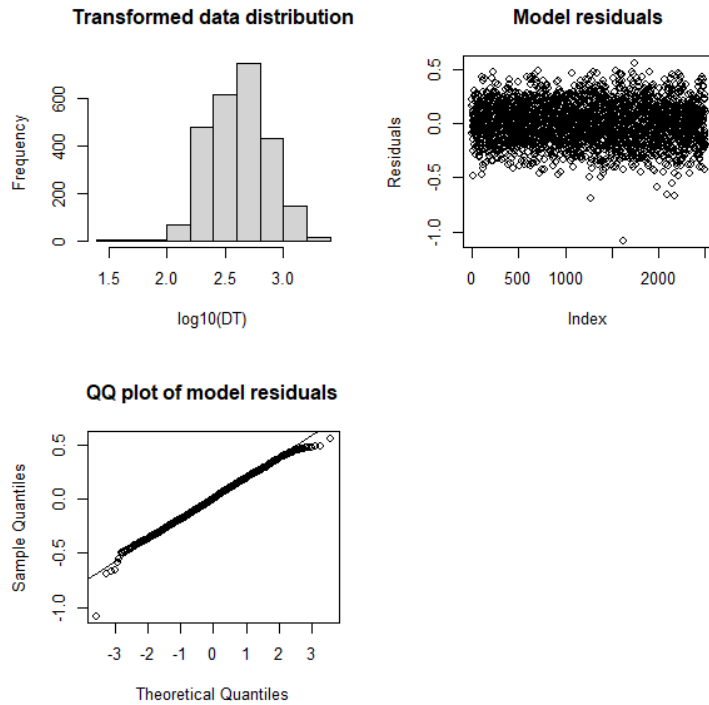
	Relatedness * Overlap * Phonological skills					
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Final random-effects structure selected: (Relatedness|Participants) + (Relatedness|Item)

FIXED-EFFECTS STRUCTURE REDUCTION with drop 1 (removing non-significant higher order interactions in descending order).

Model reduction					
	Sum Sq	df	Density df	F	<i>p</i>
Reading skills:Relatedness:Overlap	0.13	1	2340	3.42	.065
Phonological skills:Relatedness:Overlap	0.041	1	2333	1.11	.29
New model: log10(FPDT) ~ (Relatedness + Overlap + scale(Reading skills))^3 + (Relatedness + Overlap + scale(Phonological skills))^2 + RE					
Reading skills:Relatedness:Overlap	0.086	1	2341	2.33	.13
Phonological skills: Relatedness	0.049	1	56	1.31	.42
Phonological skills: Overlap	0.024	1	2362	0.66	.26
New model: log10(FPDT) ~ (Relatedness + Overlap + scale(Reading skills))^2 + scale(Phonological skills) + RE					
Phonological skills	0.035	1	47	0.95	.33
Reading skills:Relatedness	0.089	1	50	2.40	.13
Reading skills:Overlap	0.038	1	2334	1.03	.31
Relatedness:Overlap	0.020	1	62	0.53	.47
New model: log10(FPDT) ~ scale(Reading skills) + Relatedness * Overlap + RE					
Reading skills	0.088	1	47	2.36	.13
Relatedness	0.043	1	42	1.16	.29
Overlap	0.024	1	64	0.64	.43

Final model selected: log10(FPDT) ~ Relatedness + Overlap + (Relatedness|Participant) + (Relatedness|Item)



Model summary (p values from model comparison)

Fixed Effects						
	Est/Beta	SE	95% CI	df	t	Significance
Intercept	2.60	0.022	2.56; 2.65	87	120.27	<.0001
Relatedness	0.011	0.010	-0.008; 0.030	42	1.10	$\chi^2(1) = 1.18, p = .28$
Overlap	-0.021	0.026	-0.072; 0.031	64	-0.80	$\chi^2(1) = 0.63, p = .43$
Random Effects						
	Variance		S.D.		Correlation	
Item (Intercept)	0.010		0.10			
Relatedness (Item)	0.002		0.039		0.22	

Participant (Intercept)	0.015	0.12	
Relatedness (Participant)	0.0005	0.023	-0.86
Residual	0.037	0.19	
Model fit			
R ²	Marginal	Conditional	
	0.002	0.40	
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 2506; Nb of participants: 48; Nb of items: 64			

2.2.3 Regression path duration

RANDOM EFFECT STRUCTURE REDUCTION

Data: log10 transformed

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness*Overlap slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness & Overlap slopes	Singular fit.					

Full_Reduced2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		
Full_Reduced3	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P1	Relatedness * Overlap * Reading skills +	Intercept + Relatedness slope	Intercept	Converges.		

	Relatedness * Overlap * Phonological skills					
Full_Reduced_P2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept	Singular fit.		
Full_Reduced_I1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness slope	Intercept + Relatedness slope	Singular fit.		
Full_Reduced_I2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness slope	Intercept + Overlap slope	Singular fit.		

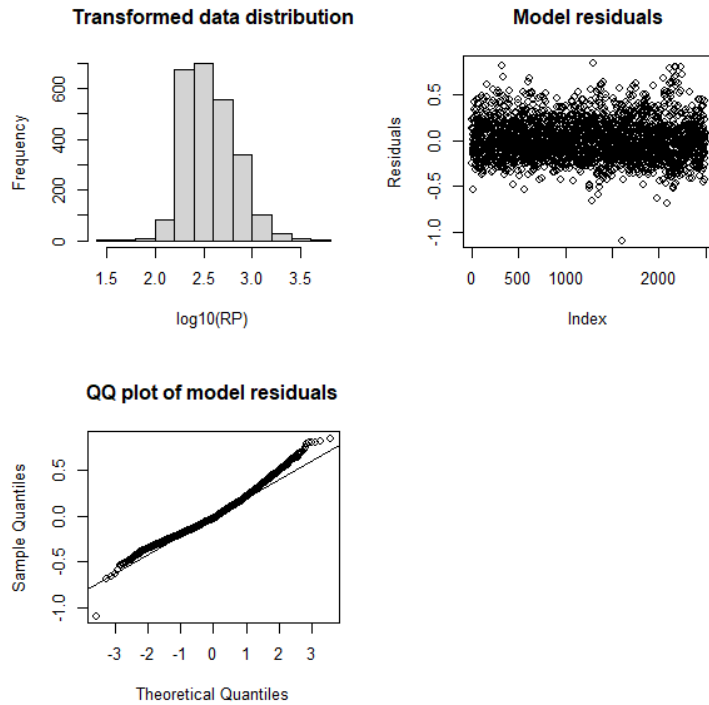
Final random-effects structure selected: (Relatedness|Participants) + (1|Item)

FIXED-EFFECTS STRUCTURE REDUCTION with drop 1 (removing non-significant higher order interactions in descending order).

Model reduction

	Sum Sq	df	Density df	F	<i>p</i>
Reading skills:Relatedness:Overlap	0.12	1	2367	2.55	.11
Phonological skills:Relatedness:Overlap	0.003	1	2373	0.058	.81
New model: $\log_{10}(\text{FPDT}) \sim (\text{Relatedness} + \text{Overlap} + \text{scale}(\text{Reading skills}))^2 + (\text{Relatedness} + \text{Overlap} + \text{scale}(\text{Phonological skills}))^2 + \text{RE}$					
Reading skills:Relatedness	0.088	1	47	1.83	.18
Reading skills:Overlap	0.015	1	2366	0.32	.57
Relatedness:Overlap	0.037	1	2359	0.78	.38
Phonological skills: Relatedness	0.009	1	53	0.18	.67
Phonological skills: Overlap	0.036	1	2372	0.76	.38
New model: $\log_{10}(\text{FPDT}) \sim \text{scale}(\text{Reading skills}) + \text{Relatedness} + \text{Overlap} + \text{scale}(\text{Phonological skills}) + \text{RE}$					
Reading skills	0.29	1	46	6.09	.017 *
Relatedness	0.66	1	47	13.77	.0005 ***
Overlap	0.047	1	63	0.99	.32
Phonological skills	0.038	1	47	0.79	.38

Final model selected: $\log_{10}(\text{FPDT}) \sim \text{scale}(\text{Reading skills}) + \text{Relatedness} + \text{Overlap} + (\text{Relatedness}|\text{Participant}) + (1|\text{Item})$



Model summary (p values from model comparison)

Fixed Effects						
	Est/Beta	SE	95% CI	df	t	Significance
Intercept	2.55	0.018	2.52; 2.59	96	138.83	<.0001
Reading skills (scaled)	-0.41	0.013	-0.066; -0.017	46	-3.39	$\chi^2(1) = 9.31, p = .002 **$
Relatedness	0.039	0.010	0.018; 0.059	47	3.71	$\chi^2(1) = 12.01, p = .0005 ***$
Overlap	-0.028	0.028	-0.082; 0.027	63	-1.00	$\chi^2(1) = 0.98, p = .32$
Random Effects						
	Variance		S.D.	Correlation		
Item (Intercept)	0.011		0.11			

Participant (Intercept)	0.007	0.083	
Relatedness (Participant)	0.001	0.038	-0.19
Residual	0.048	0.22	
Model fit			
R ²	Marginal	Conditional	
	0.033	0.30	
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 2500; Nb of participants: 48; Nb of items: 64			

2.2.4 Regression rate

RANDOM EFFECT STRUCTURE REDUCTION

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness*Overlap slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness & Overlap slopes	Singular fit.					
Full_Reduced2	Relatedness * Overlap *	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness & Overlap slopes	Singular fit.					

	Reading skills + Relatedness * Overlap * Phonological skills					
Full_Reduced3	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P1	Relatedness * Overlap * Reading skills + Relatedness * Overlap *	Intercept + Relatedness slope	Intercept	Converges.		

	Phonological skills					
Full_Reduced_P2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept	Singular fit.		
Full_Reduced_I1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness slope	Intercept + Relatedness slope	Singular fit.		
Full_Reduced_I2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness slope	Intercept + Overlap slope	Does not converge.		

Final random-effects structure selected: (Relatedness|Participants) + (1|Item)

FIXED-EFFECTS STRUCTURE REDUCTION with model comparison (removing non-significant higher order interactions in descending order). The significance of each term in the left column was evaluated by comparing a model without it to the model right above in the table.

Model name	Model reduction	Model reduction						
		npar	AIC	BIC	LL	df	χ^2	<i>p</i>
Full	Full model	16	2249	2343	-1108.6			
Reduced 1	Reading skills:Relatedness:Overlap	15	2248	2336	-1109.0	1	0.62	.43

Reduced 2	Phonological skills:Relatedness:Overlap	14	2246	2328	-1109.0	1	0.019	.89
Reduced 3	Phonological skills: Overlap	13	2244	2320	-1109.1	1	0.28	.60
Reduced 4	Phonological skills: Relatedness	12	2243	2314	-1109.6	1	0.95	.33
Reduced 5	Reading skills:Overlap	11	2241	2306	-1109.7	1	0.19	.66
Reduced 6	Reading skills:Relatedness	10	2240	2298	-1109.7	1	0.13	.71
Reduced 7	Relatedness:Overlap	9	2238	2290	-1109.8	1	0.073	.79
Reduced 8	Phonological skills	8	2238	2285	-1111.1	1	2.61	0.11
Reduced 9	Reading skills	7	2239	2280	-1112.7	1	3.25	.071 .

Final model selected: Reg_out ~ scale (Reading skills) + Relatedness + Overlap + (Relatedness |Participant) + (1 | Item), family = binomial(link = "logit").

Model summary (*p* values from model comparison)

Fixed Effects					
	Est/Beta	SE	95% CI	z	Significance
Intercept	-1.92	0.14	-2.19; -1.64	-13.66	<.0001
Reading skills (scaled)	0.18	0.097	-0.011; 0.37	1.85	$\chi^2(1) = 3.04, p = .081$.
Relatedness	0.52	0.13	0.26; 0.78	3.93	$\chi^2(1) = 14.06, p = .00018$ ***
Overlap	-0.066	0.22	-0.49; 0.36	-0.31	$\chi^2(1) = 0.093, p = .76$
Random Effects					
	Variance	S.D.	Correlation		
Item (Intercept)	0.52	0.72			
Participant (Intercept)	0.32	0.56			
Relatedness (Participant)	0.12	0.35	-0.48		
Model fit					
R ² (theoretical)	Marginal			Conditional	
	0.024			0.23	
R ² (delta)	Marginal			Conditional	
	0.012			0.12	
Key: p-values for fixed effects calculated using Satterthwaite's approximations.					
Confidence Intervals have been calculated using the Wald method.					
Nb observations: 2600; Nb of participants: 48; Nb of items: 64					

2.2.5 *Skipping rate*

RANDOM EFFECT STRUCTURE REDUCTION

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness*Overlap slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness & Overlap slopes	Singular fit.					
Full_Reduced2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness & Overlap slopes	Singular fit.					
Full_Reduced3	Relatedness * Overlap * Reading skills + Relatedness * Overlap *	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness slope	Singular fit.					

	Phonological skills					
Full_Reduced4	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness slope	Intercept	Singular fit.		
Full_Reduced_P2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept	Converges		
Full_Reduced_I1	Relatedness * Overlap *	Intercept + Overlap slope	Intercept + Relatedness slope	Converges.		

	Reading skills + Relatedness * Overlap * Phonological skills					
Full_Reduced_I2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept + Overlap slope	Does not converge.		

Final random-effects structure selected: (Overlap|Participants) + (Relatedness |Item)

FIXED-EFFECTS STRUCTURE REDUCTION with model comparison (removing non-significant higher order interactions in descending order). The significance of each term in the left column was evaluated by comparing a model without it to the model right above in the table.

Model name	Model reduction							
		npar	AIC	BIC	LL	df	χ^2	<i>p</i>
Full	Full model	18	2101	2210	-1032.6			
Reduced 1	Reading skills:Relatedness:Overlap	17	2099	2202	-1032.7	1	0.16	.69
Reduced 2	Phonological skills:Relatedness:Overlap	16	2105	2201	-1036.4	1	7.50	.0062
<i>This interaction is retained in the model. The following model is therefore compared to model Reduced 1.</i>								
Reduced 3	Reading skills:Overlap	16	2097	2194	-1033	1	0.009	.092
Reduced 4	Reading skills:Relatedness	15	2096	2186	-1033	1	0.25	.62
Reduced 5	Reading skills	14	2100	2185	-1036	1	6.56	.010

Final model selected: Skips ~ scale (Reading skills) + scale(Phonological skills) * Relatedness * Overlap + (Overlap |Participant) + (Relatedness | Item), family = binomial(link = "logit").

Model summary (*p* values from model comparison)

Fixed Effects

	Est/Beta	SE	95% CI	z	Significance
Intercept	-2.62	0.24	-3.10; -2.14	-10.72	<.0001
Reading skills (scaled)	0.49	0.18	0.13; 0.84	2.66	$\chi^2(1) = 7.11, p = .0077^{**}$
Phonological skills (scaled)	-0.089	0.18	-0.44; 0.27	-0.49	$\chi^2(1) = 0.19, p = .66$
Relatedness	-0.039	0.16	-0.35; 0.27	-0.24	$\chi^2(1) = 0.12, p = .73$
Overlap	0.80	0.39	0.040; 1.56	2.06	$\chi^2(1) = 3.51, p = .061$
Phonological skills: Relatedness	-0.10	0.11	-0.32; 0.11	-0.93	$\chi^2(1) = 0.19, p = .66$
Phonological skills: Overlap	-0.078	0.12	-0.32; 0.17	-0.62	$\chi^2(1) = 0.31, p = .58$
Relatedness:Overlap	-0.29	0.27	-0.81; 0.24	-1.06	$\chi^2(1) = 0.82, p = .36$
Phonological skills: Relatedness: Overlap	0.62	0.22	0.19; 1.05	2.80	$\chi^2(1) = 7.52, p = .0061^{**}$
Random Effects					
	Variance		S.D.		Correlation
Item (Intercept)	1.90		1.38		
Relatedness (Item)	0.19		0.43		-0.38
Participant (Intercept)	1.023		1.01		
Overlap (Participant)	0.15		0.38		0.25
Model fit					
R ² (theoretical)	Marginal			Conditional	
	0.059			0.51	
R ² (delta)	Marginal			Conditional	
	0.035			0.30	
Key: p-values for fixed effects calculated using Satterthwaite's approximations.					
Confidence Intervals have been calculated using the Wald method.					
Nb observations: 3068; Nb of participants: 48; Nb of items: 64					

FOLLOW-UP

Begin-overlap items

Fixed Effects					
	Est/Beta	SE	95% CI	z	Significance
Intercept	-2.97	0.31	-3.57; -2.36	-9.61	<.0001
Reading skills (scaled)	0.48	0.19	0.10; 0.85	2.49	$\chi^2(1) = 6.54, p = .011^*$

Phonological skills (scaled)	-0.063	0.18	-0.42; 0.30	-0.34	$\chi^2(1) = 0.12, p = .73$
Relatedness	-0.17	0.18	-0.37; 0.34	-0.092	$\chi^2(1) = 0.063, p = .80$
Phonological skills: Relatedness	-0.41	0.17	-0.75, -0.076	-2.41	$\chi^2(1) = 5.52, p = .019^*$
Random Effects					
	Variance	S.D.		Correlation	
Item (Intercept)	0.86	0.93			
Participant (Intercept)	1.81	1.34			
Model fit					
R ² (theoretical)	Marginal			Conditional	
	0.039			0.47	
R ² (delta)	Marginal			Conditional	
	0.019			0.23	
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 1534; Nb of participants: 48; Nb of items: 32 Model equation: Skips ~scale (Reading skills) + scale(Phonological skills) * Relatedness + (1 Participant) + (1 Item)					

End-overlap items

Fixed Effects					
	Est/Beta	SE	95% CI	z	Significance
Intercept	-2.21	0.31	-2.81; -1.60	-7.15	<.0001
Reading skills (scaled)	0.50	0.20	0.12; 0.89	2.56	$\chi^2(1) = 6.03, p = .014^*$
Phonological skills (scaled)	-0.13	0.19	-0.51; 0.25	-0.66	$\chi^2(1) = 0.47, p = .49$
Relatedness	-0.28	0.15	-0.57; 0.022	-1.81	$\chi^2(1) = 2.38, p = .084$
Phonological skills: Relatedness	0.22	0.14	-0.061; 0.50	1.53	$\chi^2(1) = 2.26, p = .13$
Random Effects					
	Variance	S.D.		Correlation	
Item (Intercept)	1.10	1.05			
Participant (Intercept)	1.93	1.39			
Model fit					

R ² (theoretical)	Marginal	Conditional
	0.036	0.50
R ² (delta)	Marginal	Conditional
	0.025	0.34
<p>Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 1534; Nb of participants: 48; Nb of items: 32 Model equation: Skips ~scale (Reading skills) + scale(Phonological skills) * Relatedness + (1 Participant) + (1 Item)</p>		

2.3 Prime/Control

2.3.1 First pass dwell time

RANDOM EFFECT STRUCTURE REDUCTION

Data: log10 transformed

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness*Overlap slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness & Overlap slopes	Singular fit.					

Full_Reduced2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		
Full_Reduced3	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P1	Relatedness * Overlap * Reading skills +	Intercept + Relatedness slope	Intercept	Singular fit.		

	Relatedness * Overlap * Phonological skills					
Full_Reduced_P2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept	Singular fit.		
Full_Reduced_I1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept	Intercept + Relatedness slope	Converges.		
Full_Reduced_I2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept	Intercept + Overlap slope	Does not converge.		

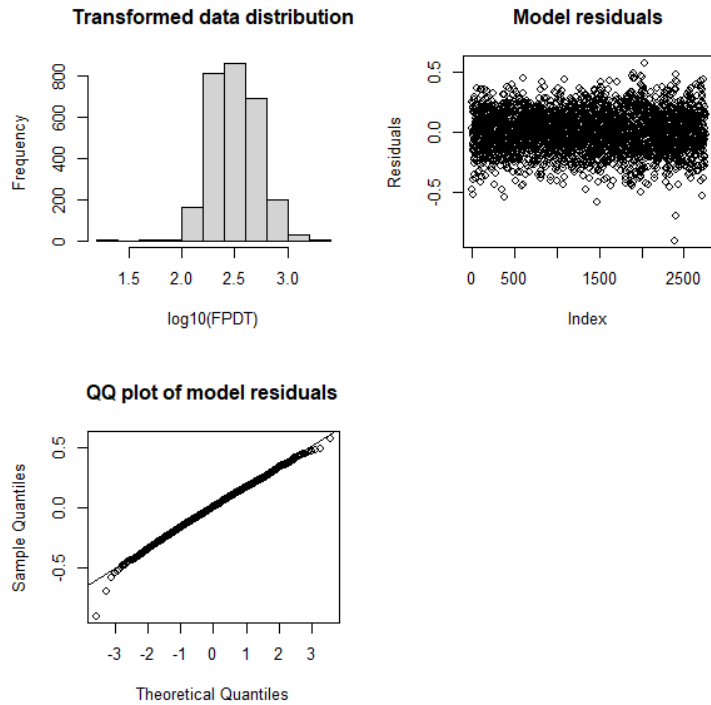
Final random-effects structure selected: (1|Participants) + (Relatedness|Item)

FIXED-EFFECTS STRUCTURE REDUCTION with drop 1 (removing non-significant higher order interactions in descending order).

Model reduction					
	Sum Sq	df	Density df	F	<i>p</i>
Reading skills:Relatedness:Overlap	0.063	1	2598	2.08	.15

Phonological skills:Relatedness:Overlap	0.042	1	2604	1.39	.24
New model: $\log_{10}(\text{FPDT}) \sim (\text{Relatedness} + \text{Overlap} + \text{scale}(\text{Reading skills}))^2 + (\text{Relatedness} + \text{Overlap} + \text{scale}(\text{Phonological skills}))^2 + \text{RE}$					
Reading skills:Relatedness	0.008	1	2586	0.25	.61
Reading skills:Overlap	0.007	1	2587	0.22	.64
Relatedness:Overlap	.0001	1	61	0.004	.95
Phonological skills: Relatedness	0.001	1	2592	0.042	.84
Phonological skills: Overlap	.0001	1	2619	0.002	.97
New model: $\log_{10}(\text{FPDT}) \sim \text{scale}(\text{Reading skills}) + \text{Relatedness} + \text{Overlap} + \text{scale}(\text{Phonological skills}) + \text{RE}$					
Reading skills	.47	1	47	15.68	.0003 ***
Phonological skills	.016	1	47	0.53	.47
Relatedness	.0007	1	61	0.024	.88
Overlap	.0002	1	64	0.005	.94

Final model selected: $\log_{10}(\text{FPDT}) \sim \text{scale}(\text{Reading skills}) + \text{Relatedness} + \text{Overlap} + (1|\text{Participant}) + (\text{Relatedness}|\text{Item})$



Model summary (p values from model comparison)

Fixed Effects						
	Est/Beta	SE	95% CI	df	t	Significance
Intercept	2.49	0.015	2.46; 2.52	92	163.66	< .0001
Reading skills (scaled)	-0.057	0.012	-0.079; -0.034	47	-4.92	$\chi^2(1) = 16.69, p < .001$ ***
Relatedness	0.001	0.008	-0.014; 0.017	61	0.16	$\chi^2(1) = 0.054, p = .88$
Overlap	0.001	0.020	-0.038; 0.041	64	0.07	$\chi^2(1) = 0.005, p = .94$
Random Effects						
	Variance		S.D.		Correlation	
Item (Intercept)	0.006		0.078			

Relatedness (Item)	0.001	0.036	-0.39
Participant (Intercept)	0.006	0.078	
Residual	0.030	0.17	
Model fit			
R ²	Marginal	Conditional	
	0.071	0.34	
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 2753; Nb of participants: 48; Nb of items: 64			

2.3.2 Dwell time

RANDOM EFFECT STRUCTURE REDUCTION

Data: log10 transformed

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness*Overlap slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness & Overlap slopes	Singular fit.					

Full_Reduced2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		
Full_Reduced3	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P1	Relatedness * Overlap * Reading skills +	Intercept + Relatedness slope	Intercept	Converges		

	Relatedness * Overlap * Phonological skills					
Full_Reduced_P2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept	Converges		
Full_Reduced_I1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept + Relatedness slope	Singular		
Full_Reduced_I2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept + Overlap slope	Does not converge.		

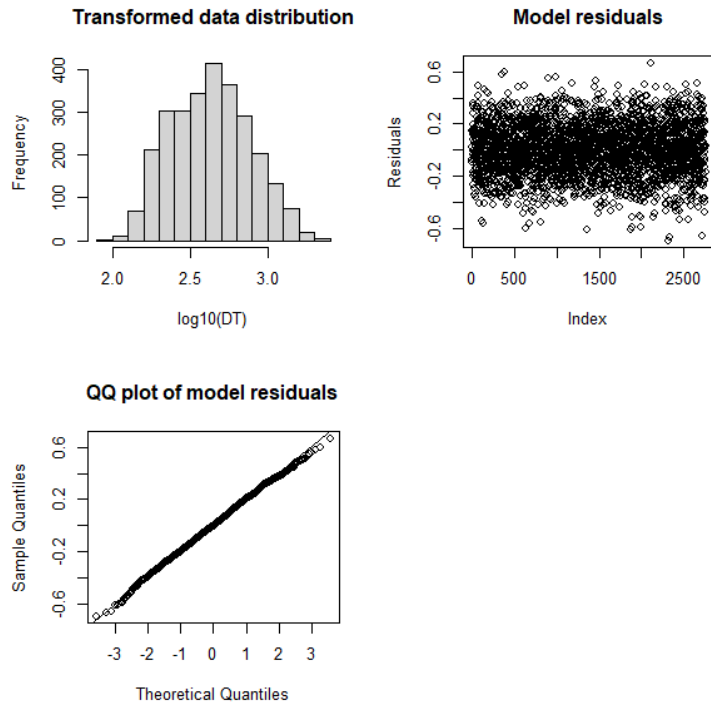
Final random-effects structure selected: (Overlap|Participant) + (1|Item)

FIXED-EFFECTS STRUCTURE REDUCTION with drop 1 (removing non-significant higher order interactions in descending order).

Model reduction					
	Sum Sq	df	Density df	F	<i>p</i>
Reading skills:Relatedness:Overlap	0.023	1	2606	0.57	.45

Phonological skills:Relatedness:Overlap	0.007	1	2611	0.18	.67
New model: $\log_{10}(\text{FPDT}) \sim (\text{Relatedness} + \text{Overlap} + \text{scale}(\text{Reading skills}))^2 + (\text{Relatedness} + \text{Overlap} + \text{scale}(\text{Phonological skills}))^2 + \text{RE}$					
Reading skills:Relatedness	< .0001	1	2614	0.001	.98
Reading skills:Overlap	0.012	1	48	0.29	.59
Relatedness:Overlap	0.033	1	2606	0.82	.37
Phonological skills: Relatedness	0.002	1	2611	0.049	.83
Phonological skills: Overlap	0.003	1	47	0.085	.77
New model: $\log_{10}(\text{FPDT}) \sim \text{scale}(\text{Reading skills}) + \text{Relatedness} + \text{Overlap} + \text{scale}(\text{Phonological skills}) + \text{RE}$					
Reading skills	0.020	1	47	0.50	.48
Phonological skills	0.008	1	2610	0.20	.66
Relatedness	0.012	1	64	0.29	.59
Overlap	0.082	1	47	2.05	.16

Final model selected: $\log_{10}(\text{DT}) \sim \text{Relatedness} + \text{Overlap} + (\text{Overlap}|\text{Participant}) + (1|\text{Item})$



Model summary (p values from model comparison)

Fixed Effects						
	Est/Beta	SE	95% CI	df	t	Significance
Intercept	2.62	0.024	2.58; 2.67	75	111.30	<.0001
Relatedness	0.003	0.008	-0.012; 0.018	2610	0.45	$\chi^2(1) = 0.29, p = .59$
Overlap	0.013	0.024	-0.035; 0.061	64	0.54	$\chi^2(1) = 0.20, p = .66$
Random Effects						
	Variance		S.D.		Correlation	
Item (Intercept)	0.009		0.093			
Participant (Intercept)	0.20		0.14			

Overlap (Participant)	0.0002	0.015	-0.35
Residual	0.040	0.20	
Model fit			
R ²	Marginal	Conditional	
	< 0.001	0.41	
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 2759; Nb of participants: 48; Nb of items: 64			

2.3.3 Regression path duration

RANDOM EFFECT STRUCTURE REDUCTION

Data: log10 transformed

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness*Overlap slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness & Overlap slopes	Singular fit.					

Full_Reduced2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		
Full_Reduced3	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P 1	Relatedness * Overlap * Reading skills +	Intercept + Relatedness slope	Intercept	Singular fit.		

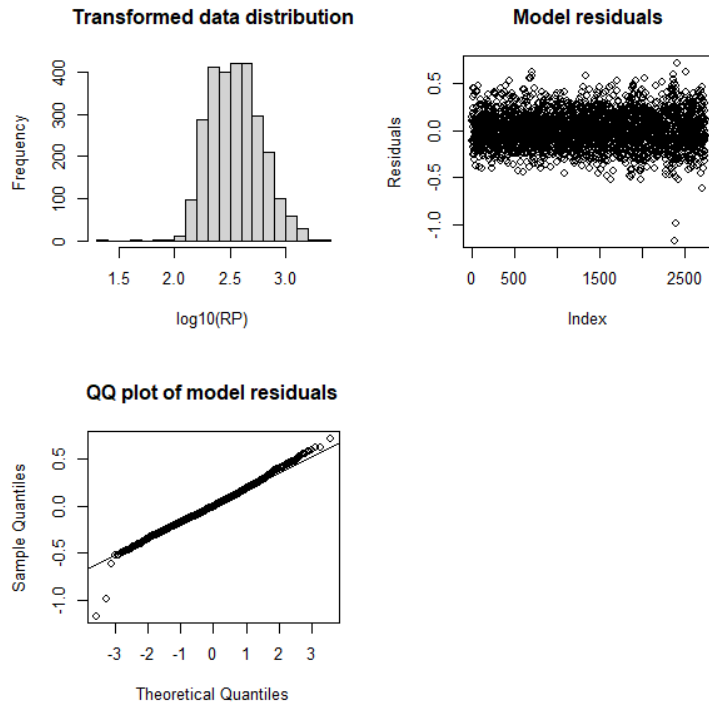
	Relatedness * Overlap * Phonological skills								
Full_Reduced_P 2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept	Singular fit.					
Full_Reduced_I1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept	Intercept + Relatedness slope	Converges.					
Full_Reduced_I1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness slope	Intercept + Relatedness slope	Converges.					
				AIC	BIC	LL	npar	df	X ²
				-1057.8	-957.15	545.9	17		
Full_Reduced_I2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept	Intercept + Overlap slope	Converges.					
				Compared to: Full_Reduced_I1					
				AIC	BIC	LL	npar	df	X ²
				-1043.2	-942.56	538.6	17	0	0

Final random-effects structure selected: (1|Participant) + (Relatedness|Item)

FIXED-EFFECTS STRUCTURE REDUCTION with drop 1 (removing non-significant higher order interactions in descending order).

Model reduction					
	Sum Sq	df	Density df	F	<i>p</i>
Reading skills:Relatedness:Overlap	0.025	1	2583	0.69	.40
Phonological skills:Relatedness:Overlap	0.005	1	2588	0.15	.70
New model: $\log_{10}(\text{FPDT}) \sim (\text{Relatedness} + \text{Overlap} + \text{scale}(\text{Reading skills}))^2 + (\text{Relatedness} + \text{Overlap} + \text{scale}(\text{Phonological skills}))^2 + \text{RE}$					
Reading skills:Relatedness	0.045	1	2582	1.28	.26
Reading skills:Overlap	0.001	1	2582	0.033	.86
Relatedness:Overlap	0.003	1	62	0.091	.76
Phonological skills: Relatedness	0.006	1	2588	0.17	.68
Phonological skills: Overlap	0.007	1	2614	0.19	.66
New model: $\log_{10}(\text{FPDT}) \sim \text{scale}(\text{Reading skills}) + \text{Relatedness} + \text{Overlap} + \text{scale}(\text{Phonological skills}) + \text{RE}$					
Reading skills	0.38	1	47	10.83	.002 **
Phonological skills	0.007	1	62	0.19	.66
Relatedness	0.021	1	64	0.59	.45
Overlap	0.012	1	47	0.34	.57

Final model selected: $\log_{10}(\text{DT}) \sim \text{scale}(\text{Reading skills}) + \text{Relatedness} + \text{Overlap} + (1|\text{Participant}) + (\text{Relatedness}|\text{Item})$



Model summary (p values from model comparison)

Fixed Effects						
	Est/Beta	SE	95% CI	df	t	Significance
Intercept	2.54	0.017	2.51; 2.58	93	150.54	<.0001
Reading skills	-0.052	0.013	-0.077; -0.027	47	-4.08	$\chi^2(1) = 14.36, p < .001$ ***
Relatedness	0.004	0.009	-0.014; 0.022	62	0.44	$\chi^2(1) = 0.19, p = .66$
Overlap	0.012	0.022	-0.026; 0.059	64	0.77	$\chi^2(1) = 0.59, p = .44$
Random Effects						
	Variance		S.D.		Correlation	

Item (Intercept)	0.008	0.087	
Relatedness (Item)	0.002	0.047	-0.51
Participant (Intercept)	0.007	0.086	
Residual	0.035	0.19	
Model fit			
R ²	Marginal	Conditional	
	0.052	0.34	
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 2750; Nb of participants: 48; Nb of items: 64			

2.3.4 Regression rate

RANDOM EFFECT STRUCTURE REDUCTION

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness*Overlap slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness & Overlap slopes	Singular fit.					

Full_Reduced2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		
Full_Reduced3	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P1	Relatedness * Overlap * Reading skills +	Intercept + Relatedness slope	Intercept	Singular fit.		

	Relatedness * Overlap * Phonological skills					
Full_Reduced_P2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept	Singular fit.		
Full_Reduced_I1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept	Intercept + Relatedness slope	Singular fit.		
Full_Reduced_I2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept	Intercept + Overlap slope	Converges.		

Final random-effects structure selected: (1|Participants) + (Overlap |Item)

FIXED-EFFECTS STRUCTURE REDUCTION with model comparison (removing non-significant higher order interactions in descending order). The significance of each term in the left column was evaluated by comparing a model without it to the model right above in the table.

Model name	Model reduction	Model reduction						
		npar	AIC	BIC	LL	df	χ^2	<i>p</i>
Full	Full model	16	1774	1869	-870.96			
Reduced 1	Reading skills:Relatedness:Overlap	15	1773	1862	-871.26	1	0.61	.44

Reduced 2	Phonological skills:Relatedness:Overlap	14	1771	1854	-871.40	1	0.27	.60
Reduced 3	Phonological skills: Overlap	13	1769	1846	-871.48	1	0.16	.69
Reduced 4	Phonological skills: Relatedness	The model does not converge without the Phonological skills: Relatedness interaction. The Overlap slope per item is removed. A model 3b is computed without the overlap slope per item as well and those two models are compared.						
Reduced 3b	Phonological skills: Overlap (no Overlap slope per item)	11	1767	1832	-872.37			
Reduced 4	Phonological skills: Relatedness (no Overlap slope per item)	10	1767	1832	-872.37	1	1.26	.26
Reduced 5	Reading skills:Overlap (no Overlap slope per item)	9	1764	1818	-873.03	1	0.065	.80
Reduced 6	Reading skills:Relatedness (no Overlap slope per item)	8	1765	1813	-874.70	1	3.33	.068 .
<i>As the interaction is marginally significant, it is retained in the model. The following model is compared to model Reduced 5.</i>								
Reduced 7	Relatedness:Overlap (no Overlap slope per item)	8	1764	1818	-873.03	1	0.052	.82
Reduced 8	Phonological skills	7	1760	1802	-873.18	1	0.25	.62

Final model selected: Reg_out ~ scale (Reading skills) + Relatedness + Overlap + scale (Reading skills) : Relatedness + (1 |Participant) + (1 | Item), family = binomial(link = "logit").

Model summary (p values from model comparison)

Fixed Effects					
	Est/Beta	SE	95% CI	z	Significance
Intercept	-2.53	0.16	-2.84; -2.22	-16.08	<.0001
Reading skills (scaled)	0.18	0.14	-0.094; 0.45	1.29	$\chi^2(1) = 1.56, p = .21$
Relatedness	0.049	0.13	-0.20; 0.30	0.38	$\chi^2(1) = 0.04, p = .84$
Overlap	0.37	0.17	0.026; 0.71	2.11	$\chi^2(1) = 4.21, p = .040 *$
Reading skills: Relatedness	-0.25	0.13	-0.51; 0.012	-1.87	$\chi^2(1) = 3.34, p = .068 .$
Random Effects					
	Variance	S.D.	Correlation		
Item (Intercept)	0.22	0.47			
Participant (Intercept)	0.69	0.83			
Model fit					
R ² (theoretical)	Marginal			Conditional	
	0.019			0.23	
R ² (delta)	Marginal			Conditional	

	0.007	0.083
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 2833; Nb of participants: 48; Nb of items: 64		

2.3.5 Skipping rate

RANDOM EFFECT STRUCTURE REDUCTION

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	L L	npar	df	X ²
Full	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness*Overlap slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness & Overlap slopes	Singular fit.					
Full_Reduced2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness & Overlap slopes	Singular fit.					

Full_Reduced3	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P 1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness slope	Intercept	Singular fit.		
Full_Reduced_P 2	Relatedness * Overlap * Reading skills +	Intercept + Overlap slope	Intercept	Singular fit.		

	Relatedness * Overlap * Phonological skills								
Full_Reduced_I1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept	Intercept + Relatedness slope	Converges.					
				AIC	BIC	LL	npar	df	X ²
				1461	1557	-714.39	16		
Full_Reduced_I2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept	Intercept + Overlap slope	Converges.					
				Compared to: Full_Reduced_I1					
				AIC	BIC	LL	npar	df	X ²
				1460	1557	-714.07	16	0	0

Final random-effects structure selected: (1|Participants) + (Relatedness |Item)

FIXED-EFFECTS STRUCTURE REDUCTION with model comparison (removing non-significant higher order interactions in descending order). The significance of each term in the left column was evaluated by comparing a model without it to the model right above in the table.

Model name	Model reduction	Model reduction						
		npar	AIC	BIC	LL	df	χ^2	<i>p</i>
Full	Full model	16	1461	1557	-714.39			
Reduced 1	Reading skills:Relatedness:Overlap	15	1462	1552	-715.92	1	3.05	.081 .
<i>As the interaction is marginally significant, it is retained in the model. The following model is compared to model Full.</i>								
Reduced 2	Phonological skills:Relatedness:Overlap	15	1459	1550	-714.54	1	0.29	.59
Reduced 3	Phonological skills: Overlap	14	1457	1542	-714.55	1	0.02	.89
Reduced 4	Phonological skills: Relatedness	13	1458	1536	-715.89	1	2.68	.10
Reduced 5	Phonological skills	12	1456	1528	-715.89	1	0.002	.97

Final model selected: Skips ~ scale (Reading skills) * Relatedness * Overlap + (1 |Participant) + (Relatedness | Item), family = binomial(link = "logit").

Model summary (*p* values from model comparison)

Fixed Effects					
	Est/Beta	SE	95% CI	z	Significance
Intercept	-3.24	0.21	-3.66; -2.82	-15.13	<.0001
Reading skills (scaled)	0.38	0.17	0.044; 0.71	2.22	$\chi^2(1) = 4.32, p = .038 *$
Relatedness	0.065	0.19	-0.30; 0.43	0.35	$\chi^2(1) = 0.20, p = .66$
Overlap	-0.29	0.27	-0.81; 0.23	-1.08	$\chi^2(1) = 1.30, p = .25$
Reading skills: Relatedness	0.073	0.14	-0.20; 0.35	0.52	$\chi^2(1) = 0.14, p = .71$
Reading skills: Overlap	-0.077	0.14	-0.35; 0.20	-0.56	$\chi^2(1) = 0.34, p = .56$
Relatedness: Overlap	-0.23	0.31	-0.84; 0.37	-0.75	$\chi^2(1) = 0.024, p = .88$
Reading skills: Relatedness: Overlap	0.73	0.28	0.18; 1.28	2.60	$\chi^2(1) = 6.45, p = .011 *$
Random Effects					
	Variance	S.D.	Correlation		
Item (Intercept)	0.73	0.85			
Relatedness (Item)	0.097	0.31	-0.15		
Participant (Intercept)	1.03	1.01			
Model fit					
R ² (theoretical)	Marginal			Conditional	
R ² (delta)	Marginal			Conditional	
Key: p-values for fixed effects calculated using Satterthwaite's approximations.					
Confidence Intervals have been calculated using the Wald method.					
Nb observations: 3068; Nb of participants: 48; Nb of items: 64					

3. LONG LENGTH

3.1 Target

3.1.1 First pass dwell time

RANDOM EFFECT STRUCTURE REDUCTION

Data: log10 transformed

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness*Overlap slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness & Overlap slopes	Singular fit.					
Full_Reduced2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness & Overlap slopes	Singular fit.					

Full_Reduced3	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness slope	Intercept	Singular fit.		
Full_Reduced_P2	Relatedness * Overlap * Reading skills +	Intercept + Overlap slope	Intercept	Singular fit.		

	Relatedness * Overlap * Phonological skills					
Full_Reduced_I1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept	Intercept + Relatedness slope	Converges.		
Full_Reduced_I2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept	Intercept + Overlap slope	Does not converge.		

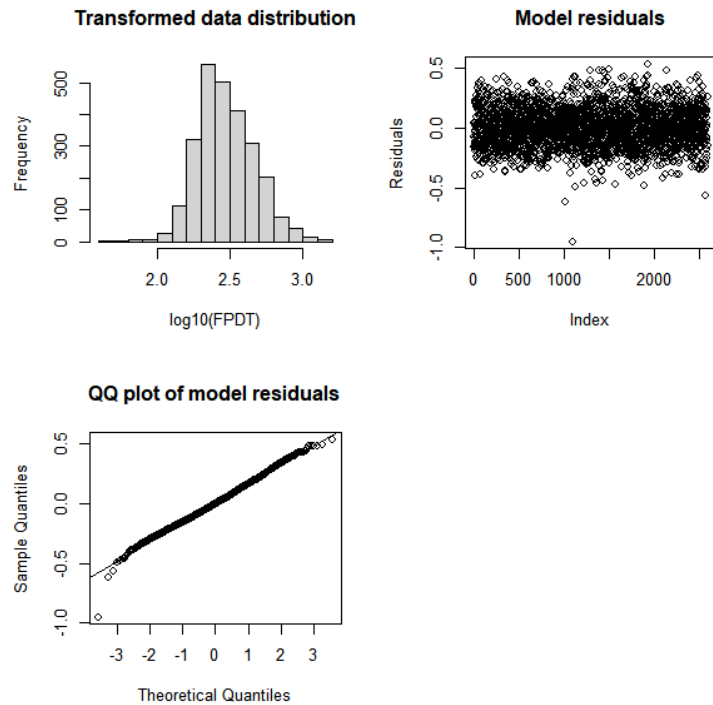
Final random-effects structure selected: (1|Participants) + (Relatedness |Item)

FIXED-EFFECTS STRUCTURE REDUCTION with drop 1 (removing non-significant higher order interactions in descending order).

Model reduction					
	Sum Sq	df	Density df	F	<i>p</i>
Reading skills:Relatedness:Overlap	0.064	1	2432	2.39	.12
Phonological skills:Relatedness:Overlap	0.022	1	2436	0.82	.36
New model: $\log_{10}(\text{FPDT}) \sim (\text{Relatedness} + \text{Overlap} + \text{scale}(\text{Reading skills}))^2 + (\text{Relatedness} + \text{Overlap} + \text{scale}(\text{Phonological skills}))^2 + \text{RE}$					
Reading skills:Relatedness	0.10	1	2432	3.74	.053
Reading skills:Overlap	0.10	1	2433	3.77	.052
Relatedness:Overlap	0.0045	1	61	0.17	.68
Phonological skills: Relatedness	0.0072	1	2434	0.27	.60
Phonological skills: Overlap	0.0032	1	2455	0.12	.73

New model: $\log_{10}(\text{FPDT}) \sim \text{scale}(\text{Reading skills}) * \text{Relatedness} + \text{scale}(\text{Reading skills}) * \text{Overlap} + \text{scale}(\text{Phonological skills}) + \text{RE}$					
Reading skills: Relatedness	0.099	1	2435	3.68	.055 .
Reading skills: Overlap	0.15	1	2447	5.70	.017 *
Phonological skills	0.015	1	46	0.55	.46

Final model selected: $\log_{10}(\text{FPDT}) \sim \text{scale}(\text{Reading skills}) * \text{Relatedness} + \text{scale}(\text{Reading skills}) * \text{Overlap} + (1 | \text{Participant}) + (\text{Relatedness} | \text{Item})$



Model summary (*p* values from model comparison)

Fixed Effects						
	Est/Beta	SE	95% CI	df	t	Significance
Intercept	2.46	0.014	2.43; 2.49	78	175.07	<.0001

Reading skills (scaled)	-0.052	0.012	-0.075; -0.029	46	-4.46	$\chi^2(1) = 16.68, p < .001$ ***
Relatedness	0.0050	0.008	-0.010; 0.020	60	0.67	$\chi^2(1) = 0.43, p = .51$
Overlap	0.028	0.017	-0.004; 0.060	64	1.70	$\chi^2(1) = 2.85, p = .091$.
Reading skills * Relatedness	0.012	0.006	-0.0003; 0.025	2435	1.92	$\chi^2(1) = 3.65, p = .056$.
Reading skills * Overlap	-0.015	0.006	-0.028; -0.003	2447	-2.39	$\chi^2(1) = 5.70, p = .017$ *
Random Effects						
	Variance	S.D.		Correlation		
Item (Intercept)	0.0037	0.061				
Relatedness (Item)	0.0009	0.030		0.19		
Participant (Intercept)	0.0062	0.079				
Residual	0.027	0.16				
Model fit						
R ²	Marginal		Conditional			
	0.076		0.33			
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 2592; Nb of participants: 48; Nb of items: 64						

3.1.2 Dwell time

RANDOM EFFECT STRUCTURE REDUCTION

Data: log10 transformed

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness*Overlap slope	Singular fit.					

Full_Reduced1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness & Overlap slopes	Singular fit.		
Full_Reduced2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		
Full_Reduced3	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Reading skills +	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		

	Relatedness * Overlap * Phonological skills					
Full_Reduced_P1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness slope	Intercept	Singular fit.		
Full_Reduced_P2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept	Singular fit.		
Full_Reduced_I1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept	Intercept + Relatedness slope	Converges.		
Full_Reduced_I2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept	Intercept + Overlap slope	Does not converge.		

Full_Reduced_I1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept	Intercept + Relatedness slope	Converges.					
				-862.06	-762.47	448	17		
Full_Reduced_I2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept	Intercept + Overlap slope	Compared to: Full_Reduced_I1					
				-862.69	-763.10	448.35	17	0	0
Full_Reduced_I3	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness slope	Intercept + Relatedness & Overlap slope	Does not converge.					

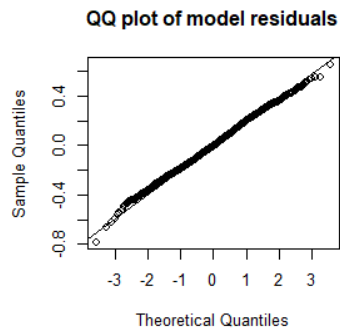
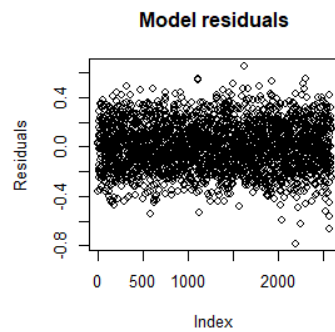
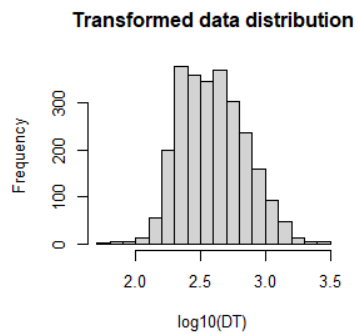
Final random-effects structure selected: (1|Participants) + (Relatedness|Item)

FIXED-EFFECTS STRUCTURE REDUCTION with drop 1 (removing non-significant higher order interactions in descending order).

Model reduction						
	Sum Sq	df	Density df	F	<i>p</i>	
Reading skills:Relatedness:Overlap	0.053	1	2432	1.44	.23	
Phonological skills:Relatedness:Overlap	0.025	1	2430	0.68	.41	
New model: $\log_{10}(\text{FPDT}) \sim (\text{Relatedness} + \text{Overlap} + \text{scale}(\text{Reading skills}))^2 + (\text{Relatedness} + \text{Overlap} + \text{scale}(\text{Phonological skills}))^2 + \text{RE}$						
Reading skills:Relatedness	0.16	1	2432	4.32	.038	
Reading skills:Overlap	0.28	1	2432	7.69	.006	

Relatedness:Overlap	0.0036	1	62	0.10	.76
Phonological skills: Relatedness	0.0068	1	2430	0.19	.67
Phonological skills: Overlap	0.10	1	2456	2.78	.096
New model: $\log_{10}(\text{FPDT}) \sim \text{scale}(\text{Reading skills}) * \text{Relatedness} + \text{scale}(\text{Reading skills}) * \text{Overlap} + \text{scale}(\text{Phonological skills}) * \text{Overlap} + \text{RE}$					
Reading skills: Relatedness	0.17	1	2432	4.55	.033
Reading skills: Overlap	0.28	1	2432	7.71	.0055
Phonological skills: Overlap	0.10	1	2456	2.81	.094

Final model selected: $\log_{10}(\text{FPDT}) \sim \text{scale}(\text{Reading skills}) * \text{Relatedness} + \text{scale}(\text{Reading skills}) * \text{Overlap} + \text{scale}(\text{Phonological skills}) * \text{Overlap} + (1|\text{Participant}) + (\text{Relatedness}|\text{Item})$



Model summary (*p* values from model comparison)

Fixed Effects						
	Est/Beta	SE	95% CI	df	t	Significance
Intercept	2.58	0.023	2.54; 2.63	79	113.63	<.0001
Reading skills (scaled)	-0.029	0.022	-0.072; 0.013	47	-1.34	$\chi^2(1) = 3.93, p = .047 *$
Relatedness	0.012	0.008	-0.005; 0.028	62	1.40	$\chi^2(1) = 1.85, p = .17$
Overlap	0.025	0.025	-0.025; 0.074	63	0.97	$\chi^2(1) = 0.92, p = .34$
Phonological skills (scaled)	-0.019	0.022	-0.062; 0.023	47	-0.89	$\chi^2(1) = 0.79, p = .37$
Reading skills: Relatedness	0.016	0.008	0.001; 0.031	2435	2.13	$\chi^2(1) = 4.44, p = .035 *$
Reading skills: Overlap	-0.024	0.009	-0.041; -0.007	2432	-2.78	$\chi^2(1) = 5.05, p = .025 *$
Phonological skills: Overlap	0.015	0.009	-0.002; 0.032	2456	1.68	$\chi^2(1) = 2.81, p = .094 .$
Random Effects						
	Variance	S.D.			Correlation	
Item (Intercept)	0.009	0.097				
Relatedness (Item)	0.0007	0.026			0.09	
Participant (Intercept)	0.017	0.13				
Residual	0.037	0.19				
Model fit						
R ²	Marginal		Conditional			
	0.032		0.44			
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 2587; Nb of participants: 48; Nb of items: 64						

FOLLOW-UP FOR INTERACTION

3.1.3 Regression path duration

RANDOM EFFECT STRUCTURE REDUCTION

Data: log10 transformed

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness*Overlap slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness & Overlap slopes	Singular fit.					
Full_Reduced2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness & Overlap slopes	Singular fit.					
Full_Reduced3	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness slope	Singular fit.					

Full_Reduced4	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness slope	Intercept	Singular fit.		
Full_Reduced_P2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept	Singular fit.		
Full_Reduced_I1	Relatedness * Overlap * Reading skills +	Intercept	Intercept + Relatedness slope	Converges		

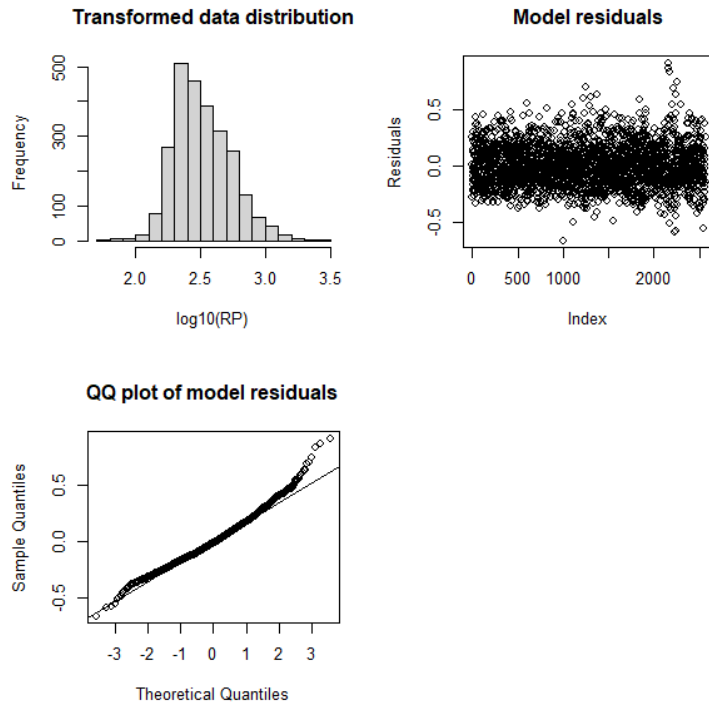
	Relatedness * Overlap * Phonological skills					
Full_Reduced_I2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept	Intercept + Overlap slope	Singular fit.		

Final random-effects structure selected: (1|Participants) + (Relatedness|Item)

FIXED-EFFECTS STRUCTURE REDUCTION with drop 1 (removing non-significant higher order interactions in descending order).

Model reduction					
	Sum Sq	df	Density df	F	<i>p</i>
Reading skills:Relatedness:Overlap	0.042	1	2411	1.21	.27
Phonological skills:Relatedness:Overlap	0.0037	1	2419	0.11	.74
New model: log10(FPDT) ~ (Relatedness + Overlap + scale(Reading skills))^2 + (Relatedness + Overlap + scale(Phonological skills))^2 + RE					
Reading skills:Relatedness	0.081	1	2410	2.32	.13
Reading skills:Overlap	0.42	1	2411	12.14	.0005
Relatedness:Overlap	0.0003	1	63	0.008	.93
Phonological skills: Relatedness	0.0017	1	2418	0.049	.82
Phonological skills: Overlap	0.0079	1	2436	0.23	.63
New model: log10(FPDT) ~ scale(Reading skills) * Overlap + Relatedness + scale(Phonological skills) + RE					
Relatedness	0.002	1	63	0.048	.83
Phonological skills	0.016	1	46	0.47	.50
Reading skills * Overlap	0.48	1	2423	13.67	.0002

Final model selected: log10(FPDT) ~ scale(Reading skills) * Overlap + Relatedness + (1|Participant) + (Relatedness|Item)



Model summary (p values from model comparison)

Fixed Effects						
	Est/Beta	SE	95% CI	df	t	Significance
Intercept	2.51	0.016	2.47; 2.54	73	154.04	<.0001
Reading skills (scaled)	-0.04	0.014	-0.070; -0.016	46	-3.12	$\chi^2(1) = 8.87, p = .0029$ **
Overlap	0.024	0.018	-0.011; 0.059	63	1.33	$\chi^2(1) = 1.80, p = .18$
Relatedness	0.002	0.009	-0.015; 0.019	63	0.22	$\chi^2(1) = 0.042, p = .84$
Reading skills* Overlap	-0.027	0.007	-0.042; -0.013	2423	-3.70	$\chi^2(1) = 13.64, p = .0002$ ***

Random Effects			
	Variance	S.D.	Correlation
Item (Intercept)	0.0043	0.066	
Relatedness (Intercept)	0.0011	0.034	-0.21
Participant (Intercept)	0.0087	0.093	
Residual	0.035	0.19	
Model fit			
R ²	Marginal	Conditional	
	0.044	0.31	
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 2568; Nb of participants: 48; Nb of items: 64			

3.1.4 Regression rate

RANDOM EFFECT STRUCTURE REDUCTION

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness*Overlap slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness & Overlap slopes	Singular fit.					

Full_Reduced2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		
Full_Reduced3	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P1	Relatedness * Overlap * Reading skills +	Intercept + Relatedness slope	Intercept	Singular fit.		

	Relatedness * Overlap * Phonological skills					
Full_Reduced_P2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept	Singular fit.		
Full_Reduced_I1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept	Intercept + Relatedness slope	Singular fit.		
Full_Reduced_I2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept	Intercept + Overlap slope	Does not converge.		

Final random-effects structure selected: (1|Participants) + (1|Item)

FIXED-EFFECTS STRUCTURE REDUCTION with model comparison (removing non-significant higher order interactions in descending order). The significance of each term in the left column was evaluated by comparing a model without it to the model right above in the table.

Model name	Model reduction							
		npar	AIC	BIC	LL	df	χ^2	<i>p</i>
Full	Full model	14	1729	1812	-850.60			

Reduced 1	Reading skills:Relatedness:Overlap	13	1729	1805	-851.35	1	1.50	.22
Reduced 2	Phonological skills:Relatedness:Overlap	12	1727	1798	-851.56	1	0.42	.52
Reduced 3	Phonological skills: Overlap	11	1725	1790	-851.59	1	0.063	.80
Reduced 4	Phonological skills: Relatedness	10	1723	1782	-851.59	1	0.0018	.97
Reduced 5	Reading skills:Overlap	9	1727	1780	-854.61	1	6.04	.014
<i>This interaction is retained in the model. The following model is therefore compared to model Reduced 4, which includes the Reading skills: Overlap interaction.</i>								
Reduced 6	Reading skills:Relatedness	9	1721	1774	-851.69	1	0.20	.66
Reduced 7	Relatedness:Overlap	8	1720	1767	-851.99	1	0.60	.44
Reduced 8	Phonological skills	7	1718	1759	-851.99	1	0.0015	.97

Final model selected: Reg_out ~ Relatedness + Overlap + scale (Reading skills) : Overlap + (1 | Participant) + (1 | Item), family = binomial(link = "logit").

Model summary (*p* values from model comparison)

Fixed Effects					
	Est/Beta	SE	95% CI	z	Significance
Intercept	-2.51	0.16	-2.82; -2.19	-15.48	<.0001
Reading skills (scaled)	0.26	0.12	0.023; 0.50	2.15	$\chi^2(1) = 4.39, p = .036 *$
Overlap	-0.17	0.23	-0.62; 0.29	-0.71	$\chi^2(1) = 0.93, p = .34$
Relatedness	-0.15	0.13	-0.40; 0.10	-1.15	$\chi^2(1) = 1.25, p = .26$
Reading skills: Overlap	-0.33	0.13	-0.59; -0.071	-2.50	$\chi^2(1) = 5.96; p = .015$
Random Effects					
	Variance	S.D.	Correlation		
Item (Intercept)	0.56	0.75			
Participant (Intercept)	0.48	0.69			
Model fit					
R ² (theoretical)	Marginal		Conditional		
	0.024		0.26		
R ² (delta)	Marginal		Conditional		
	0.0093		0.10		
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method.					

Nb observations: 2651; Nb of participants: 48; Nb of items: 64
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3.1.5 Skipping rate

RANDOM EFFECT STRUCTURE REDUCTION

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness*Overlap slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness & Overlap slopes	Singular fit.					
Full_Reduced2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness & Overlap slopes	Singular fit.					
Full_Reduced3	Relatedness * Overlap * Reading skills +	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness slope	Singular fit.					

	Relatedness * Overlap * Phonological skills					
Full_Reduced4	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness slope	Intercept	Singular fit.		
Full_Reduced_P2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept	Converges.		

Full_Reduced_I1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept + Relatedness slope	Singular.		
Full_Reduced_I2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept + Overlap slope	Converges, but reduced models do not converge.		

Final random-effects structure selected: (Overlap|Participants) + (1 |Item)

FIXED-EFFECTS STRUCTURE REDUCTION with model comparison (removing non-significant higher order interactions in descending order). The significance of each term in the left column was evaluated by comparing a model without it to the model right above in the table.

Model name	Model reduction	Model reduction						
		npar	AIC	BIC	LL	df	χ^2	<i>p</i>
Full	Full model	16	2170	2266	-1068.9			
Reduced 1	Reading skills:Relatedness:Overlap	15	2169	2259	-1069.2	1	0.77	.38
Reduced 2	Phonological skills:Relatedness:Overlap	14	2168	2253	-1070.1	1	1.69	.19
Reduced 3	Phonological skills: Overlap	13	2166	2245	-1070.1	1	0.056	.81
Reduced 4	Phonological skills: Relatedness	12	2165	2237	-1070.4	1	0.56	.45
Reduced 5	Reading skills:Overlap	11	2163	2229	-1070.5	1	0.25	.61
Reduced 6	Reading skills:Relatedness	10	2161	2221	-1070.6	1	0.069	.79
Reduced 7	Relatedness:Overlap	9	2160	2214	-1070.9	1	0.75	.39
Reduced 8	Phonological skills	8	2158	2206	-1071.0	1	0.24	.62
Reduced 9	Reading skills	7	2159	2201	-1072.4	1	2.72	.099

Final model selected: Skips ~ scale (Reading skills) + Relatedness + Overlap + (Overlap |Participant) + (1 | Item), family = binomial(link = "logit").

Full	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness*Overlap slope	Singular fit.		
Full_Reduced1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness & Overlap slopes	Singular fit.		
Full_Reduced2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		
Full_Reduced3	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Reading skills +	Intercept + Relatedness & Overlap slopes	Intercept + Overlap slope	Singular fit.		

	Relatedness * Overlap * Phonological skills					
Full_Reduced5	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness slope	Intercept	Singular fit.		
Full_Reduced_P2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept	Singular fit.		
Full_Reduced_I1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept	Intercept + Relatedness slope	Singular fit.		

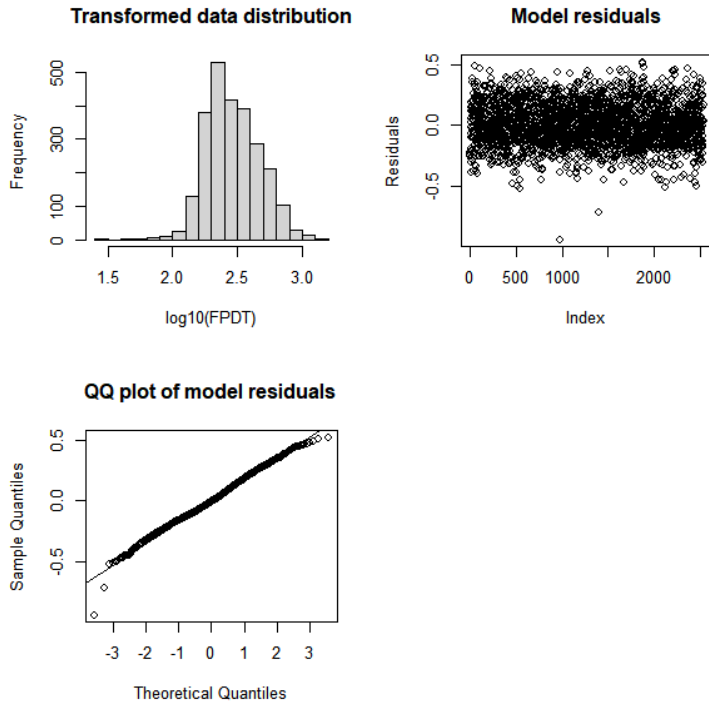
Full_Reduced_I2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept	Intercept + Overlap slope	Singular fit.		
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Final random-effects structure selected: (1|Participants) + (1 |Item)

FIXED-EFFECTS STRUCTURE REDUCTION with drop 1 (removing non-significant higher order interactions in descending order).

Model reduction					
	Sum Sq	df	Density df	F	<i>p</i>
Reading skills:Relatedness:Overlap	0.11	1	2434	0.35	.56
Phonological skills:Relatedness:Overlap	0.072	1	2441	2.34	.13
New model: $\log_{10}(\text{FPDT}) \sim (\text{Relatedness} + \text{Overlap} + \text{scale}(\text{Reading skills}))^2 + (\text{Relatedness} + \text{Overlap} + \text{scale}(\text{Phonological skills}))^2 + \text{RE}$					
Reading skills:Relatedness	0.0006	1	2435	0.020	.89
Reading skills:Overlap	0.018	1	2435	0.60	.44
Relatedness:Overlap	0.037	1	2433	1.20	.27
Phonological skills: Relatedness	0.000000	1	2442	0.000	> .99
Phonological skills: Overlap	0.031	1	2435	1.00	.32
New model: $\log_{10}(\text{FPDT}) \sim \text{scale}(\text{Reading skills}) + \text{Relatedness} + \text{Overlap} + \text{scale}(\text{Phonological skills}) + \text{RE}$					
Reading skills	0.28	1	47	9.15	.004
Relatedness	0.004	1	2434	0.14	.71
Overlap	0.050	1	63	1.64	.21
Phonological skills	0.038	1	47	1.25	.27

Final model selected: $\log_{10}(\text{FPDT}) \sim \text{scale}(\text{Reading skills}) + \text{Relatedness} + \text{Overlap} + (1 | \text{Participant}) + (1 | \text{Item})$



Model summary (*p* values from model comparison)

Fixed Effects						
	Est/Beta	SE	95% CI	df	t	Significance
Intercept	2.46	0.014	2.43; 2.48	82	179.82	<.0001
Reading skills (scaled)	-0.045	0.011	-0.067; -0.023	47	-4.04	$\chi^2(1) = 14.08, p = .0002$ ***
Relatedness	-0.0026	0.007	-0.016; 0.011	2434	-0.37	$\chi^2(1) = 0.14, p = .71$
Overlap	0.022	0.017	-0.012; 0.055	63	1.28	$\chi^2(1) = 1.62, p = .20$
Random Effects						
	Variance		S.D.		Correlation	
Item (Intercept)	0.0039		0.062			

Participant (Intercept)	0.0054	0.074	
Residual	0.031	0.18	
Model fit			
R ²	Marginal	Conditional	
	0.051	0.27	
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 2542; Nb of participants: 48; Nb of items: 64			

3.2.2 Dwell time

RANDOM EFFECT STRUCTURE REDUCTION

Data: log10 transformed

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness*Overlap slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness & Overlap slopes	Singular fit.					

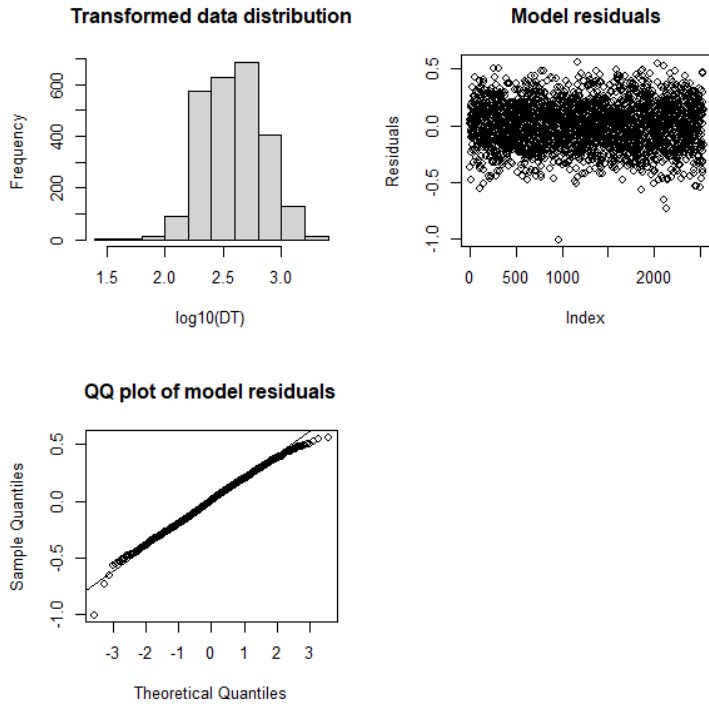
Full_Reduced2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness & Overlap slopes	Converges.		
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Final random-effects structure selected: (Relatedness + Overlap|Participants) + (Relatedness + Overlap|Item)

FIXED-EFFECTS STRUCTURE REDUCTION with drop 1 (removing non-significant higher order interactions in descending order).

Model reduction					
	Sum Sq	df	Density df	F	<i>p</i>
Reading skills:Relatedness:Overlap	0.0005	1	2356	0.012	0.91
Phonological skills:Relatedness:Overlap	0.0077	1	2359	0.19	0.66
New model: log10(FPDT) ~ (Relatedness + Overlap + scale(Reading skills))^2 + (Relatedness + Overlap + scale(Phonological skills))^2 + RE					
Reading skills:Relatedness	0.0074	1	50	0.18	.67
Reading skills:Overlap	0.018	1	46	0.44	.51
Relatedness:Overlap	0.00083	1	1859	0.021	.89
Phonological skills: Relatedness	0.016	1	52	0.39	.53
Phonological skills: Overlap	0.013	1	47	0.32	.58
New model: log10(FPDT) ~ scale(Reading skills) + Relatedness + Overlap + scale(Phonological skills) + RE					
Reading skills	0.044	1	47	1.09	.30
Relatedness	0.00015	1	48	0.0038	.95
Overlap	0.024	1	61	0.059	.45
Phonological skills	0.055	1	47	1.37	.25

Final model selected: log10(FPDT) ~ Relatedness + Overlap + (Relatedness + Overlap|Participant) + (Relatedness + Overlap|Item)



Model summary (*p* values from model comparison)

Fixed Effects						
	Est/Beta	SE	95% CI	df	t	Significance
Intercept	2.58	0.023	2.53; 2.62	71	112.87	<.0001
Relatedness	-0.00062	0.008	-0.017; 0.015	48	-0.076	$\chi^2(1) = 0.0043, p = .95$
Overlap	0.018	0.023	-0.027; 0.063	61	0.77	$\chi^2(1) = 0.59, p = .44$
Random Effects						
	Variance		S.D.		Correlation	
Item (Intercept)	0.0057		0.075			
Relatedness (Item)	0.0000085		0.0029		-0.93	
Overlap (Item)	0.0057		0.075		-0.40	0.70
Participant (Intercept)	0.019		0.14			

Relatedness (Participant)	0.00012	0.011	0.49	
Overlap (Participant)	0.00096	0.031	-0.21	0.06
Residual	0.040	0.20		
Model fit				
R ²	Marginal		Conditional	
	0.0012		0.40	
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 2540; Nb of participants: 48; Nb of items: 64				

3.2.3 Regression path duration

RANDOM EFFECT STRUCTURE REDUCTION

Data: log10 transformed

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness*Overlap slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness & Overlap slopes	Singular fit.					

Full_Reduced2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		
Full_Reduced3	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P1	Relatedness * Overlap * Reading skills +	Intercept + Relatedness slope	Intercept	Singular fit.		

	Relatedness * Overlap * Phonological skills					
Full_Reduced_P2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept	Singular fit.		
Full_Reduced_I1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept	Intercept + Relatedness slope	Converges		
Full_Reduced_I2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept	Intercept + Overlap slope	Singular fit.		

Final random-effects structure selected: (1|Participants) + (Relatedness|Item)

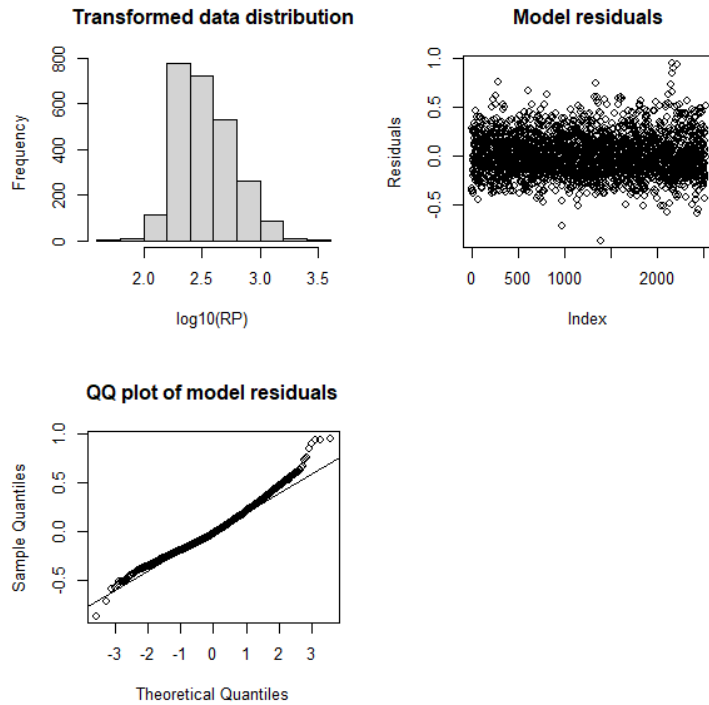
Final random-effects structure selected: (1|Participants) + (Relatedness |Item)

FIXED-EFFECTS STRUCTURE REDUCTION with drop 1 (removing non-significant higher order interactions in descending order).

Model reduction

	Sum Sq	df	Density df	F	<i>p</i>
Reading skills:Relatedness:Overlap	0.029	1	2374	0.65	.42
Phonological skills:Relatedness:Overlap	0.00003	1	2376	0.0008	.98
New model: log10(FPDT) ~ (Relatedness + Overlap + scale(Reading skills))^2 + (Relatedness + Overlap + scale(Phonological skills))^2 + RE					
Reading skills:Relatedness	0.087	1	2375	1.96	.16
Reading skills:Overlap	0.0021	1	2373	0.048	.83
Relatedness:Overlap	0.00052	1	61	0.012	.91
Phonological skills: Relatedness	0.21	1	2376	4.68	.031
Phonological skills: Overlap	0.026	1	2402	0.58	.44
New model: log10(FPDT) ~ scale(Reading skills) + Overlap + scale(Phonological skills) * Relatedness+ RE					
Reading skills	0.33	1	47	7.46	.0089
Relatedness	0.061	1	63	1.38	.25
Phonological skills * Overlap	0.13	1	2420	2.91	.088

Final model selected: log10(FPDT) ~ scale(Reading skills) + Overlap + scale(Phonological skills) * Relatedness + (1 |Participant) + (Relatedness | Item)



Model summary (p values from model comparison)

Fixed Effects						
	Est/Beta	SE	95% CI	df	t	Significance
Intercept	2.52	0.017	2.48; 2.55	86	150.55	<.0001
Reading skills (scaled)	-0.041	0.015	-0.071; -0.012	47	-2.7	$\chi^2(1) =$
Overlap	0.026	0.022	-0.017; 0.069	63	1.18	$\chi^2(1) = 1.37, p = .24$
Phonological skills (scaled)	-0.0087	0.015	-0.039; 0.021	47	-0.57	$\chi^2(1) = 0.33, p = .57$
Relatedness	0.0081	0.009	-0.0090; 0.025	61	0.93	$\chi^2(1) = 0.91, p = .34$
Phonological skills: Relatedness	-0.015	0.009	-0.031; 0.0022	2377	-1.70	$\chi^2(1) = 2.90, p = .089$
Random Effects						

	Variance	S.D.	Correlation
Item (Intercept)	0.0065	0.081	
Relatedness (Item)	0.00036	0.020	0.19
Participant (Intercept)	0.0076	0.087	
Residual	0.044	0.21	
Model fit			
R ²	Marginal	Conditional	
	0.039	0.27	
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 2522; Nb of participants: 48; Nb of items: 64			

3.2.4 Regression rate

RANDOM EFFECT STRUCTURE REDUCTION

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness*Overlap slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Reading skills + Relatedness * Overlap *	Intercept + Relatedness*Overlap slope	Intercept + Relatedness & Overlap slopes	Singular fit.					

	Phonological skills					
Full_Reduced2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		
Full_Reduced3	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P1	Relatedness * Overlap *	Intercept + Relatedness slope	Intercept	Singular fit.		

	Reading skills + Relatedness * Overlap * Phonological skills					
Full_Reduced_P2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept	Converges.		
Full_Reduced_I1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept + Relatedness slope	Singular fit.		
Full_Reduced_I2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept + Overlap slope	Converges.		

Final random-effects structure selected: (Overlap|Participants) + (Overlap |Item)

Due to the fact that some of the submodels do not converge for significance testing, the random structure (Overlap | Participants) + (1|Item) was selected. There was no significant difference between the two ($\chi^2(2) = 0.63, p = .73$).

FIXED-EFFECTS STRUCTURE REDUCTION with model comparison (removing non-significant higher order interactions in descending order).

The significance of each term in the left column was evaluated by comparing a model without it to the model right above in the table.

Model name	Model reduction	Model reduction						
		npar	AIC	BIC	LL	df	χ^2	p
Full	Full model	16	1913	2007	-940.41			
Reduced 1	Reading skills:Relatedness:Overlap	15	1918	2006	-943.81	1	6.70	.0091
<i>This interaction is retained in the model. The following model is therefore compared to model Full.</i>								
Reduced 2	Phonological skills:Relatedness:Overlap	15	1915	2003	-942.46	1	4.11	.043

Final model selected: Reg_out ~ scale(Reading skills) * Relatedness * Overlap + scale (Phonological skills) * Relatedness * Overlap + (Overlap | Participant) + (Overlap | Item), family = binomial(link = "logit").

Model summary (p values from model comparison)

Fixed Effects					
	Est/Beta	SE	95% CI	z	Significance
Intercept	-2.26	0.14	-2.54; -1.98	-15.91	<.0001
Reading skills (scaled)	-0.050	0.11	-0.27; 0.17	-0.44	$\chi^2(1) = 0.019, p = .89$
Relatedness	0.22	0.12	-0.021; 0.47	1.79	$\chi^2(1) = 1.75, p = .19$
Overlap	-0.09	0.23	-0.55; 0.37	-0.39	$\chi^2(1) = 0.022, p = .88$
Phonological skills (scaled)	0.17	0.12	-0.058; 0.40	1.47	$\chi^2(1) = 0.78, p = .38$
Reading skills: Relatedness	0.18	0.14	-0.092; 0.44	1.28	$\chi^2(1) = 0.20, p = .89$
Reading skills: Overlap	-0.072	0.15	-0.36; 0.22	-0.49	$\chi^2(1) = 0.21, p = .65$
Relatedness: Overlap	0.32	0.25	-0.17; 0.81	1.27	$\chi^2(1) = 0.61, p = .43$
Phonological skills: Relatedness	-0.43	0.15	-0.73; -0.13	-2.80	$\chi^2(1) = 6.68, p = .0097^{**}$
Phonological skills: Overlap	0.30	0.16	-0.012; 0.62	1.88	$\chi^2(1) = 1.99, p = .16$
Reading skills: Relatedness: Overlap	0.56	0.27	0.029; 1.10	2.05	$\chi^2(1) = 4.11, p = .043^*$
Phonological skills: Relatedness: Overlap	-0.80	0.30	-1.40; -0.21	-2.62	$\chi^2(1) = 6.70, p = .0091^{**}$
Random Effects					
	Variance	S.D.	Correlation		
Item (Intercept)	0.50	0.71			
Participant (Intercept)	0.29	0.54			
Overlap (Participant)	0.087	0.30	0.64		

Model fit		
R ² (theoretical)	Marginal	Conditional
	0.032	0.22
R ² (delta)	Marginal	Conditional
	0.013	0.095
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 2603; Nb of participants: 48; Nb of items: 64		

FOLLOW-UP

Sub-model for begin-overlap items

Fixed Effects					
	Est/Beta	SE	95% CI	z	Significance
Intercept	-2.24	0.19	-2.61; -1.87	-11.89	<.0001
Phonological skills (scaled)	0.033	0.13	-0.22; 0.28	0.26	$\chi^2(1) = 0.27, p = .87$
Relatedness	0.072	0.17	-0.26; 0.41	0.42	$\chi^2(1) = 0.17, p = .68$
Reading skills (scaled)	-0.026	0.12	-0.27; 0.21	-0.21	$\chi^2(1) = 0.06, p = .81$
Phonological skills: Relatedness	-0.020	0.20	-0.42; 0.38	-0.10	$\chi^2(1) = 0.16, p = .69$
Reading skills: Relatedness	-0.10	0.20	-0.49; 0.28	-0.53	$\chi^2(1) = 0.27, p = .60$
Random Effects					
	Variance	S.D.	Correlation		
Item (Intercept)	0.20	0.44			
Participant (Intercept)	0.61	0.78			
Model fit					
R ² (theoretical)	Marginal	Conditional			
	0.0014	0.20			
R ² (delta)	Marginal	Conditional			
	0.00056	0.081			
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 1286; Nb of participants: 48; Nb of items: 32					

Sub-model for end-overlap items

Fixed Effects					
	Est/Beta	SE	95% CI	z	Significance
Intercept	-2.26	0.18	-2.61; -1.91	-12.55	<.0001
Phonological skills (scaled)	0.29	0.15	0.0011; 0.59	1.97	$\chi^2(1) = 2.56, p = .11$
Relatedness	0.38	0.18	0.025; 0.73	2.10	$\chi^2(1) = 2.33, p = .13$
Reading skills (scaled)	-0.07	0.14	-0.35; 0.21	-0.51	$\chi^2(1) = 0.097, p = .76$
Phonological skills: Relatedness	-0.76	0.22	-1.19; -0.33	-3.44	$\chi^2(1) = 7.92, p = .0049 **$
Reading skills: Relatedness	0.44	0.19	0.065; 0.82	2.30	$\chi^2(1) = 5.10, p = .024 *$
Random Effects					
	Variance	S.D.	Correlation		
Item (Intercept)	0.37	0.61			
Participant (Intercept)	0.39	0.63			
Model fit					
R ² (theoretical)	Marginal			Conditional	
	0.052			0.23	
R ² (delta)	Marginal			Conditional	
	0.022			0.099	
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 1286; Nb of participants: 48; Nb of items: 32					

3.2.5 Skipping rate

RANDOM EFFECT STRUCTURE REDUCTION

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap *	Intercept + Relatedness*Overlap slope	Intercept + Relatedness*Overlap slope	Singular fit.					

	Reading skills + Relatedness * Overlap * Phonological skills					
Full_Reduced1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness & Overlap slopes	Singular fit.		
Full_Reduced2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		
Full_Reduced3	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Reading skills + Relatedness * Overlap *	Intercept + Relatedness & Overlap slopes	Intercept + Overlap slope	Singular fit.		

	Phonological skills					
Full_Reduced5	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness slope	Intercept	Singular fit.		
Full_Reduced_P2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept	Singular fit.		
Full_Reduced_I1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept	Intercept + Relatedness slope	Singular fit.		
Full_Reduced_I2	Relatedness * Overlap *	Intercept	Intercept + Overlap slope	Does not converge.		

	Reading skills + Relatedness * Overlap * Phonological skills					
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Final random-effects structure selected: (1|Participants) + (1 |Item)

FIXED-EFFECTS STRUCTURE REDUCTION with model comparison (removing non-significant higher order interactions in descending order). The significance of each term in the left column was evaluated by comparing a model without it to the model right above in the table.

Model name	Model reduction	Model reduction						
		npar	AIC	BIC	LL	df	χ^2	<i>p</i>
Full	Full model	14	2320	2405	-1146.2			
Reduced 1	Reading skills:Relatedness:Overlap	13	2320	2398	-1146.8	1	1.37	.24
Reduced 2	Phonological skills:Relatedness:Overlap	12	2318	2390	-1146.9	1	0.13	.72
Reduced 3	Phonological skills: Overlap	11	2316	2382	-1146.9	1	0.081	.78
Reduced 4	Phonological skills: Relatedness	10	2314	2374	-1147.0	1	0.001	.98
Reduced 5	Reading skills:Overlap	9	2315	2369	-1148.3	1	2.77	.096
<i>This interaction is retained in the model. The following model is therefore compared to model Reduced 4.</i>								
Reduced 6	Reading skills:Relatedness	9	2312	2366	-1147	1	0.12	.73
Reduced 7	Relatedness:Overlap	8	2313	2361	-1148.3	1	2.51	.11
Reduced 8	Phonological skills	7	2311	2353	-1148.3	1	0.0097	.92

Final model selected: Skips ~ scale (Reading skills)*Overlap + Relatedness + (1 |Participant) + (1 | Item), family = binomial(link = “logit”).

Model summary (*p* values from model comparison)

Fixed Effects					
	Est/Beta	SE	95% CI	z	Significance
Intercept	-2.26	0.19	-2.63; -1.89	-11.96	<.0001
Reading skills (scaled)	0.41	0.14	0.14; 0.68	2.96	$\chi^2(1) = 8.11, p = .0044 **$
Overlap	-0.13	0.27	-0.66; 0.40	-0.47	$\chi^2(1) = 0.40, p = .53$
Relatedness	-0.040	0.11	-0.25; 0.17	-0.36	$\chi^2(1) = 0.12, p = .72$
Reading skills : Overlap	-0.19	0.11	-0.41; 0.028	-1.71	$\chi^2(1) = 2.79, p = .095$

Random Effects			
	Variance	S.D.	Correlation
Item (Intercept)	0.93	0.96	
Participant (Intercept)	0.74	0.86	
Model fit			
R ² (theoretical)	Marginal	Conditional	
	0.035	0.36	
R ² (delta)	Marginal	Conditional	
	0.019	0.19	
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 3070; Nb of participants: 48; Nb of items: 64			

3.3 Prime/Control

3.3.1 First pass dwell time

RANDOM EFFECT STRUCTURE REDUCTION

Data: log10 transformed

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness*Overlap slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Reading skills +	Intercept + Relatedness*Overlap slope	Intercept + Relatedness & Overlap slopes	Singular fit.					

	Relatedness * Overlap * Phonological skills					
Full_Reduced2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		
Full_Reduced3	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		

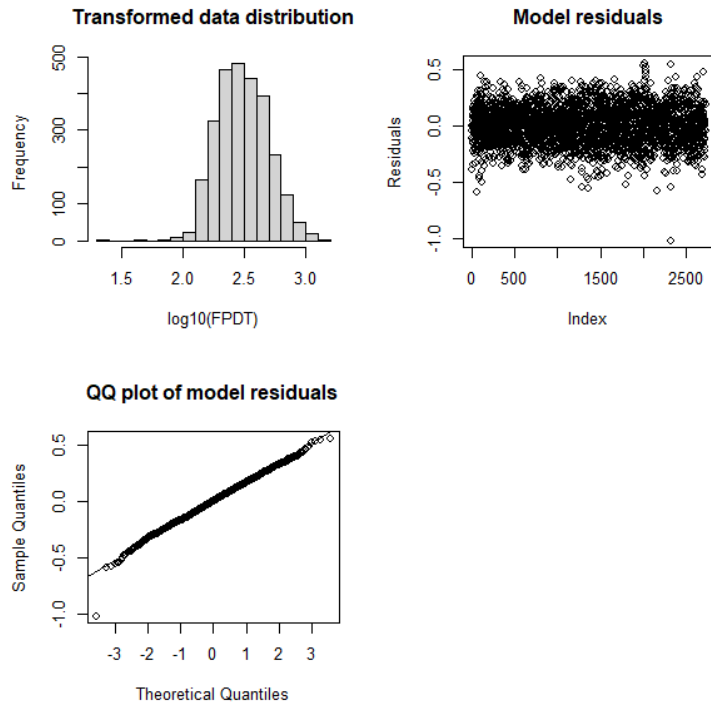
Full_Reduced_P1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness slope	Intercept	Singular fit.		
Full_Reduced_P2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept	Singular fit.		
Full_Reduced_I1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept	Intercept + Relatedness slope	Converges.		
Full_Reduced_I2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept	Intercept + Overlap slope	Does not converge.		

Final random-effects structure selected: (1|Participants) + (Relatedness|Item)

FIXED-EFFECTS STRUCTURE REDUCTION with drop 1 (removing non-significant higher order interactions in descending order).

Model reduction					
	Sum Sq	df	Density df	F	<i>p</i>
Reading skills:Relatedness:Overlap	0.016	1	2568	0.53	.47
Phonological skills:Relatedness:Overlap	0.001	1	2573	0.031	.86
New model: $\log_{10}(\text{FPDT}) \sim (\text{Relatedness} + \text{Overlap} + \text{scale}(\text{Reading skills}))^2 + (\text{Relatedness} + \text{Overlap} + \text{scale}(\text{Phonological skills}))^2 + \text{RE}$					
Reading skills:Relatedness	0.088	1	2567	2.99	.084 .
Reading skills:Overlap	0.010	1	2566	0.34	.56
Relatedness:Overlap	0.021	1	65	0.70	.41
Phonological skills: Relatedness	0.041	1	2572	1.41	.24
Phonological skills: Overlap	0.009	1	2588	0.30	.58
New model: $\log_{10}(\text{FPDT}) \sim \text{scale}(\text{Reading skills}) * \text{Relatedness} + \text{Overlap} + \text{scale}(\text{Phonological skills}) + \text{RE}$					
Reading skills:Relatedness	0.052	1	2571	1.77	.18
Phonological skills	0.006	1	47	0.21	.65
Overlap	0.15	1	64	5.07	.028
New model: $\log_{10}(\text{FPDT}) \sim \text{scale}(\text{Reading skills}) + \text{Relatedness} + \text{Overlap} + \text{RE}$					
Reading skills	0.71	1	47	24.22	< .001 ***
Relatedness	0.001	1	65	0.028	.87

Final model selected: $\log_{10}(\text{FPDT}) \sim \text{scale}(\text{Reading skills}) + \text{Relatedness} + \text{Overlap} + (1|\text{Participant}) + (\text{Relatedness}|\text{Item})$



Model summary (p values from model comparison)

Fixed Effects						
	Est/Beta	SE	95% CI	df	t	Significance
Intercept	2.48	0.014	2.45; 2.51	88	172.68	< .0001
Reading skills (scaled)	-0.055	0.011	-0.077; -0.033	47	-4.92	$\chi^2(1) = 19.69, p < .001$ ***
Relatedness	-0.002	0.009	-0.020; 0.017	65	-0.17	$\chi^2(1) = 0.026, p = .87$
Overlap	-0.041	0.018	-0.078; -0.005	64	-2.25	$\chi^2(1) = 4.81; p = .028$ *
Random Effects						
	Variance		S.D.		Correlation	
Item (Intercept)	0.005		0.070			

Relatedness (Item)	0.003	0.052	0.23
Participant (Intercept)	0.006	0.075	
Residual	0.029	0.017	
Model fit			
R ²	Marginal	Conditional	
	0.079	0.33	
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 2733; Nb of participants: 48; Nb of items: 64			

3.3.2 Dwell time

RANDOM EFFECT STRUCTURE REDUCTION

Data: log10 transformed

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness*Overlap slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness & Overlap slopes	Singular fit.					

Full_Reduced2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		
Full_Reduced3	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P1	Relatedness * Overlap * Reading skills +	Intercept + Relatedness slope	Intercept	Converges.		

	Relatedness * Overlap * Phonological skills					
Full_Reduced_P2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept	Singular.		
Full_Reduced_I1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness slope	Intercept + Relatedness slope	Converges.		
Full_Reduced_I2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness slope	Intercept + Overlap slope	Does not converge.		

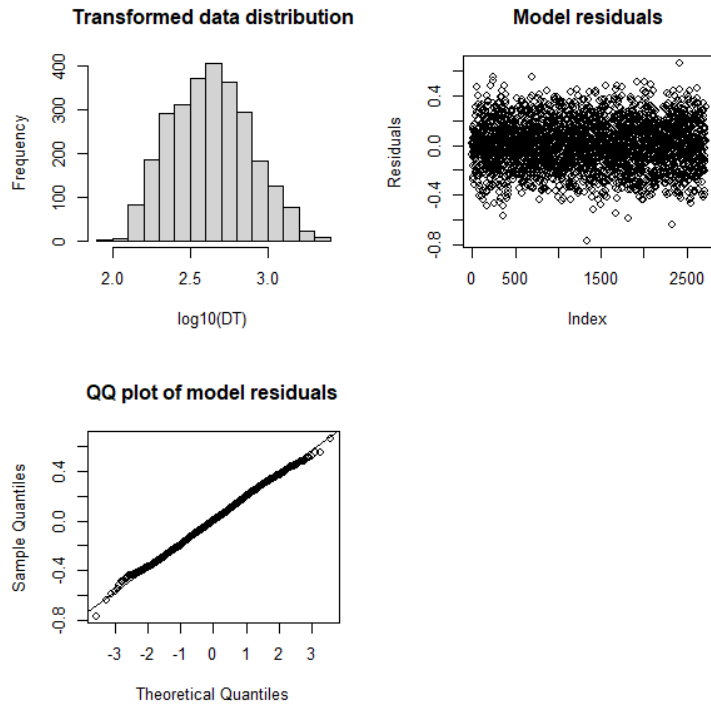
Final random-effects structure selected: (Relatedness|Participant) + (Relatedness |Item)

FIXED-EFFECTS STRUCTURE REDUCTION with drop 1 (removing non-significant higher order interactions in descending order).

Model reduction					
	Sum Sq	df	Density df	F	<i>p</i>
Reading skills:Relatedness:Overlap	0.0001	1	2511	0.005	.94

Phonological skills:Relatedness:Overlap	0.028	1	2514	0.75	.39
New model: $\log_{10}(\text{FPDT}) \sim (\text{Relatedness} + \text{Overlap} + \text{scale}(\text{Reading skills}))^2 + (\text{Relatedness} + \text{Overlap} + \text{scale}(\text{Phonological skills}))^2 + \text{RE}$					
Reading skills:Relatedness	0.034	1	47	0.90	.35
Reading skills:Overlap	0.004	1	2509	0.11	.74
Relatedness:Overlap	0.001	1	63	0.023	.88
Phonological skills: Relatedness	0.004	1	49	0.10	.75
Phonological skills: Overlap	0.17	1	2526	0.44	.51
New model: $\log_{10}(\text{FPDT}) \sim \text{scale}(\text{Reading skills}) + \text{Relatedness} + \text{Overlap} + \text{scale}(\text{Phonological skills}) + \text{RE}$					
Reading skills	0.017	1	47	0.45	.51
Phonological skills	0.042	1	47	1.10	.30
Relatedness	0.015	1	57	0.40	.53
Overlap	0.12	1	63	3.10	.083

Final model selected: $\log_{10}(\text{DT}) \sim \text{Relatedness} + \text{Overlap} + (\text{Overlap}|\text{Participant}) + (1|\text{Item})$



Model summary (p values from model comparison)

Fixed Effects						
	Est/Beta	SE	95% CI	df	t	Significance
Intercept	2.62	0.024	2.57; 2.67	71	111.49	<.0001
Relatedness	-0.008	0.012	-0.032; 0.016	57	-0.63	$\chi^2(1) = 0.39, p = .53$
Overlap	-0.041	0.023	-0.086; 0.005	63	-1.76	$\chi^2(1) = 3.03, p = .082$
Random Effects						
	Variance		S.D.		Correlation	
Item (Intercept)	0.008		0.087			
Relatedness (Item)	0.005		0.070		0.03	

Participant (Intercept)	0.020	0.14	
Relatedness (Participant)	0.001	0.027	-0.14
Residual	0.038	0.19	
Model fit			
R ²	Marginal	Conditional	
	0.006	0.44	
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 2717; Nb of participants: 48; Nb of items: 64			

3.3.3 Regression path duration

RANDOM EFFECT STRUCTURE REDUCTION

Data: log10 transformed

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness*Overlap slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness & Overlap slopes	Singular fit.					

Full_Reduced2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		
Full_Reduced3	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P 1	Relatedness * Overlap * Reading skills +	Intercept + Relatedness slope	Intercept	Converges.		

	Relatedness * Overlap * Phonological skills					
Full_Reduced_P 2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept	Singular fit.		
Full_Reduced_I1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness slope	Intercept + Relatedness slope	Converges.		
Full_Reduced_I2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness	Intercept + Overlap slope	Does not converge.		

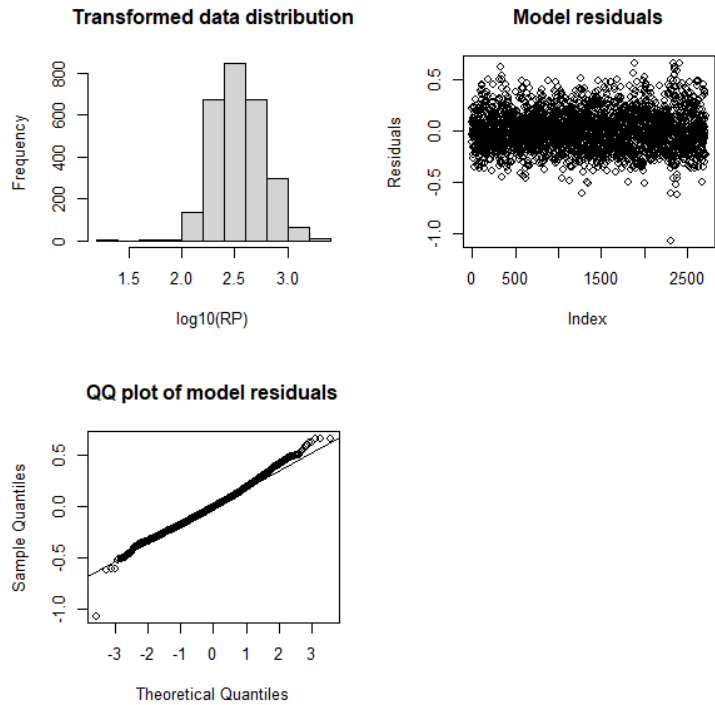
Final random-effects structure selected: (Relatedness|Participant) + (Relatedness|Item)

FIXED-EFFECTS STRUCTURE REDUCTION with drop 1 (removing non-significant higher order interactions in descending order).

Model reduction					
	Sum Sq	df	Density df	F	<i>p</i>
Reading skills:Relatedness:Overlap	0.006	1	2507	0.17	.68

Phonological skills:Relatedness:Overlap	0.10	1	2510	0.29	.59
New model: $\log_{10}(\text{FPDT}) \sim (\text{Relatedness} + \text{Overlap} + \text{scale}(\text{Reading skills}))^2 + (\text{Relatedness} + \text{Overlap} + \text{scale}(\text{Phonological skills}))^2 + \text{RE}$					
Reading skills:Relatedness	0.057	1	46	1.60	.21
Reading skills:Overlap	0.015	1	2503	0.42	.52
Relatedness:Overlap	0.003	1	62	0.09	.76
Phonological skills: Relatedness	0.005	1	48	0.13	.72
Phonological skills: Overlap	0.0001	1	2524	0.003	.96
New model: $\log_{10}(\text{FPDT}) \sim \text{scale}(\text{Reading skills}) + \text{Relatedness} + \text{Overlap} + \text{scale}(\text{Phonological skills}) + \text{RE}$					
Reading skills	0.26	1	47	7.10	.011 *
Phonological skills	< 0.001	1	47	< 0.001	.98
Relatedness	0.19	1	64	5.41	.023 *
Overlap	0.017	1	47	0.47	.49

Final model selected: $\log_{10}(\text{DT}) \sim \text{scale}(\text{Reading skills}) + \text{Relatedness} + \text{Overlap} + (\text{Relatedness}|\text{Participant}) + (\text{Relatedness}|\text{Item})$



Model summary (p values from model comparison)

Fixed Effects						
	Est/Beta	SE	95% CI	df	t	Significance
Intercept	2.53	0.017	2.50; 2.56	82	150.71	<.0001
Reading skills	-0.047	0.014	-0.074; -0.020	47	-3.43	$\chi^2(1) = 10.21, p = .001^{**}$
Relatedness	-0.0002	0.010	-0.020; 0.020	47	-0.020	$\chi^2(1) < .001, p = .98$
Overlap	-0.046	0.020	-0.085; -0.007	64	-2.33	$\chi^2(1) = 5.18, p = .023^*$
Random Effects						
	Variance		S.D.		Correlation	
Item (Intercept)	0.006		0.075			

Relatedness (Item)	0.003	0.056	0.26
Participant (Intercept)	0.009	0.093	
Relatedness (Participant)	0.0002	0.014	0.31
Residual	0.036	0.19	
Model fit			
R ²	Marginal		Conditional
	0.051		0.033
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 2709; Nb of participants: 48; Nb of items: 64			

3.3.4 Regression rate

RANDOM EFFECT STRUCTURE REDUCTION

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	LL	npar	df	X ²
Full	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness*Overlap slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness & Overlap slopes	Singular fit.					

Full_Reduced2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness & Overlap slopes	Singular fit.		
Full_Reduced3	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P1	Relatedness * Overlap * Reading skills +	Intercept + Relatedness slope	Intercept	Converges.		

	Relatedness * Overlap * Phonological skills					
Full_Reduced_P2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept	Converges.		
Full_Reduced_I1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness slope	Intercept + Relatedness slope	Converges.		
Full_Reduced_I2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness slope	Intercept + Overlap slope	Does not converge.		

Final random-effects structure selected: (Relatedness|Participants) + (Relatedness |Item)

FIXED-EFFECTS STRUCTURE REDUCTION with model comparison (removing non-significant higher order interactions in descending order). The significance of each term in the left column was evaluated by comparing a model without it to the model right above in the table.

Model name	Model reduction							
		npar	AIC	BIC	LL	df	χ^2	<i>p</i>
Full	Full model	18	1926	2033	-945.03			

Reduced 1	Reading skills:Relatedness:Overlap	17	1925	2026	-945.31	1	0.56	.45
Reduced 2	Phonological skills:Relatedness:Overlap	16	1923	2018	-945.40	1	0.19	.67
Reduced 3	Phonological skills: Overlap	15	1925	2014	-947.34	1	3.88	.049 *
<i>As the interaction is significant, it is retained in the model. The following model is compared to model Reduced 2.</i>								
Reduced 4	Phonological skills: Relatedness	15	1921	2010	-945.47	1	0.15	.70
Reduced 5	Reading skills:Overlap	14	1922	2005	-947.05	1	3.16	.075 .
<i>As the interaction is marginally significant, it is retained in the model. The following model is compared to model Reduced 4.</i>								
Reduced 6	Reading skills:Relatedness	14	1920	2003	-945.79	1	0.63	.43
Reduced 7	Relatedness:Overlap	13	1920	1997	-947.11	1	2.66	.10

Final model selected: Reg_out ~ scale (Reading skills) + Relatedness + Overlap + scale (Phonological skills) + scale (Reading skills) : Overlap + scale(Phonological skills) : Overlap + (Relatedness |Participant) + (Relatedness | Item), family = binomial(link = "logit").

Model summary (*p* values from model comparison)

Fixed Effects					
	Est/Beta	SE	95% CI	z	Significance
Intercept	-2.34	0.14	-2.62; -2.07	-16.72	<.0001
Reading skills (scaled)	0.21	0.14	-0.069; 0.48	1.47	$\chi^2(1) = 2.58, p = .11$
Relatedness	-0.071	0.17	-0.41; 0.27	-0.41	$\chi^2(1) = 0.24, p = .63$
Overlap	-0.15	0.16	-0.46; 0.16	-0.97	$\chi^2(1) = 1.17, p = .28$
Phonological skills (scaled)	-0.015	0.14	-0.29; 0.26	-0.11	$\chi^2(1) = 0.048, p = .83$
Reading skills: Overlap	-0.27	0.14	-0.54; 0.010	-1.89	$\chi^2(1) = 1.24, p = .27$
Phonological skills: Overlap	0.28	0.14	0.002; 0.56	1.98	$\chi^2(1) = 3.79, p = .051$
Random Effects					
	Variance	S.D.	Correlation		
Item (Intercept)	0.15	0.38			
Relatedness (Item)	0.37	0.65	0.60		
Participant (Intercept)	0.53	0.73			
Relatedness (Participant)	0.011	0.10	0.33		
Model fit					
R ² (theoretical)	Marginal		Conditional		

	0.016	0.20
R ² (delta)	Marginal	Conditional
	0.006	0.079
Key: p-values for fixed effects calculated using Satterthwaite's approximations. Confidence Intervals have been calculated using the Wald method. Nb observations: 2795; Nb of participants: 48; Nb of items: 64		

3.3.5 Skipping rate

RANDOM EFFECT STRUCTURE REDUCTION

Model name	Fixed effects	Random Effects (participants)	Random Effects (item)	Model fit				LRT Test against nested	
				AIC	BIC	L L	npar	df	X ²
Full	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness*Overlap slope	Singular fit.					
Full_Reduced1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness*Overlap slope	Intercept + Relatedness & Overlap slopes	Singular fit.					
Full_Reduced2	Relatedness * Overlap *	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness & Overlap slopes	Singular fit.					

	Reading skills + Relatedness * Overlap * Phonological skills					
Full_Reduced3	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Relatedness slope	Singular fit.		
Full_Reduced4	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept + Overlap slope	Singular fit.		
Full_Reduced5	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Relatedness & Overlap slopes	Intercept	Singular fit.		
Full_Reduced_P 1	Relatedness * Overlap * Reading skills + Relatedness * Overlap *	Intercept + Relatedness slope	Intercept	Singular fit.		

	Phonological skills					
Full_Reduced_P2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept + Overlap slope	Intercept	Singular fit.		
Full_Reduced_I1	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept	Intercept + Relatedness slope	Singular fit.		
Full_Reduced_I2	Relatedness * Overlap * Reading skills + Relatedness * Overlap * Phonological skills	Intercept	Intercept + Overlap slope	Singular fit.		

Final random-effects structure selected: (1|Participants) + (1|Item)

FIXED-EFFECTS STRUCTURE REDUCTION with model comparison (removing non-significant higher order interactions in descending order). The significance of each term in the left column was evaluated by comparing a model without it to the model right above in the table.

Model name	Model reduction	Model reduction						
		npar	AIC	BIC	LL	df	χ^2	<i>p</i>
Full	Full model	14	1663	1742	-818.54			

Reduced 1	Reading skills:Relatedness:Overlap	13	1665	1750	-818.54	1	0.003	.96
Reduced 2	Phonological skills:Relatedness:Overlap	12	1662	1734	-818.95	1	0.81	.37
Reduced 3	Phonological skills: Overlap	11	1662	1728	-819.95	1	2.008	.16
Reduced 4	Phonological skills: Relatedness	10	1660	1721	-820.10	1	0.29	.59
Reduced 5	Reading skills: Overlap	9	1659	1713	-820.48	1	0.78	.38
Reduced 6	Reading skills: Relatedness	8	1659	1713	-820.48	1	0.002	.97
Reduced 7	Relatedness: Overlap	7	1655	1687	-820.52	1	0.069	.79
Reduced 8	Phonological skills	6	1653	1689	-820.58	1	0.12	.73
Reduced 9	Reading skills	5	1658	1688	-823.82	1	6.47	.011 *

Final model selected: Skips ~ scale (Reading skills) + Relatedness + Overlap + (1 |Participant) + (1 | Item), family = binomial(link = "logit").

Model summary (*p* values from model comparison)

Fixed Effects					
	Est/Beta	SE	95% CI	z	Significance
Intercept	-2.95	0.20	-3.34; -2.56	-14.74	<.0001
Reading skills (scaled)	0.44	0.17	0.11; 0.76	2.63	$\chi^2(1) = 6.47, p = .011 *$
Relatedness	0.045	0.13	-0.21; 0.30	0.34	$\chi^2(1) = 0.11, p = .74$
Overlap	0.23	0.23	-0.22; 0.68	1.01	$\chi^2(1) = 1.00, p = .32$
Random Effects					
	Variance	S.D.	Correlation		
Item (Intercept)	0.53	0.73			
Participant (Intercept)	1.03	1.01			
Model fit					
R ² (theoretical)	Marginal			Conditional	
	0.04			0.35	
R ² (delta)	Marginal			Conditional	
	0.015			0.13	
Key: p-values for fixed effects calculated using Satterthwaite's approximations.					
Confidence Intervals have been calculated using the Wald method.					
Nb observations: 3070; Nb of participants: 48; Nb of items: 64					