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### **Attention Deficit/Hyperactivity Disorder and Reading Disorder and Reading Disorder More Alike than Different:**

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APPENDICES

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## APPENDIX A

## Words Orthographical Decision Task

Pseudohomo- phones			<i>English</i>			
	<i>Valid Words*</i>	Frequency	<i>Translation*</i>	Valid Word	Frequency	<i>English Translation*</i>
bant	<i>band</i>	222	<i>ribbon</i>	baard	33	<i>beard</i>
beelt	<i>beeld</i>	319	<i>picture</i>	bank	284	<i>couch</i>
blat	<i>blad</i>	85	<i>leave</i>	bleek	286	<i>pale</i>
bloet	<i>bloed</i>	170	<i>blood</i>	blik	199	<i>can</i>
breet	<i>breed</i>	161	<i>broad</i>	broer	308	<i>brother</i>
doot	<i>dood</i>	539	<i>death</i>	doos	74	<i>box</i>
drat	<i>draad</i>	43	<i>thread</i>	draak	15	<i>dragon</i>
faak	<i>vaak</i>	1577	<i>often</i>	gast	115	<i>guest</i>
fast	<i>vast</i>	867	<i>solid</i>	graag	1078	<i>readily</i>
fies	<i>vies</i>	124	<i>dirty</i>	grauw	12	<i>grey</i>
flet	<i>flat</i>	68	<i>flat</i>	groen	184	<i>green</i>
fuil	<i>vuil</i>	30	<i>dirt</i>	hond	247	<i>dog</i>
gelt	<i>geld</i>	1433	<i>money</i>	huid	101	<i>skin</i>
gijt	<i>geit</i>	10	<i>goat</i>	kaars	10	<i>candle</i>
gragt	<i>gracht</i>	19	<i>canal</i>	kast	194	<i>cupboard</i>
greis	<i>grijs</i>	62	<i>grey</i>	klaar	690	<i>ready</i>
hant	<i>hand</i>	926	<i>hand</i>	kont	33	<i>bottom</i>
haut	<i>hout</i>	275	<i>wood</i>	kous	7	<i>stocking</i>
hont	<i>hond</i>	247	<i>dog</i>	kwaad	184	<i>angry</i>
huit	<i>huid</i>	101	<i>skin</i>	lang	1861	<i>long</i>
kaard	<i>kaart</i>	318	<i>card</i>	leeg	166	<i>empty</i>
kand	<i>kant</i>	1266	<i>lace</i>	licht	443	<i>light</i>
kaud	<i>koud</i>	205	<i>cold</i>	macht	139	<i>power</i>
klijn	<i>klein</i>	806	<i>small</i>	mand	42	<i>basket</i>
kord	<i>kort</i>	494	<i>short</i>	meel	7	<i>flour</i>
kweit	<i>kwijt</i>	448	<i>lost</i>	meid	73	<i>maiden</i>
lant	<i>land</i>	855	<i>land</i>	naald	24	<i>needle</i>
leew	<i>leeuw</i>	15	<i>lion</i>	naast	752	<i>next</i>
lugt	<i>lucht</i>	320	<i>sky</i>	niets	1000	<i>nothing</i>
meew	<i>meeuw</i>	8	<i>seagull</i>	nooit	2462	<i>never</i>
mont	<i>mond</i>	307	<i>mouth</i>	post	82	<i>mail</i>

nieuws	<i>nieuws</i>	277	<i>news</i>	riem	20	<i>belt</i>
noort	<i>moord</i>	64	<i>murder</i>	rond	821	<i>round</i>
pund	<i>punt</i>	728	<i>point</i>	schot	49	<i>shot</i>
rant	<i>rand</i>	109	<i>edge</i>	snoep	18	<i>candy</i>
reik	<i>rijk</i>	129	<i>rich</i>	spuit	11	<i>syringe</i>
ront	<i>rond</i>	821	<i>round</i>	taal	362	<i>language</i>
saak	<i>zaak</i>	540	<i>case</i>	tent	289	<i>tent</i>
schad	<i>schat</i>	74	<i>treasure</i>	traan	15	<i>tear</i>
seep	<i>zeep</i>	26	<i>soap</i>	vaas	35	<i>vase</i>
sneeuw	<i>sneeuw</i>	122	<i>snow</i>	vals	39	<i>false</i>
speit	<i>spijt</i>	108	<i>regret</i>	vier	2375	<i>four</i>
tant	<i>tand</i>	12	<i>tooth</i>	vlot	42	<i>quick</i>
tauw	<i>touw</i>	56	<i>robe</i>	vraag	1399	<i>question</i>
trijn	<i>trein</i>	419	<i>train</i>	vroeg	982	<i>early</i>
vagt	<i>vacht</i>	11	<i>fur</i>	vuil	30	<i>dirt</i>
veif	<i>vijf</i>	1895	<i>five</i>	zaag	4	<i>saw</i>
vrouw	<i>vrouw</i>	1055	<i>woman</i>	zaal	123	<i>room</i>
zaat	<i>zaad</i>	9	<i>seed</i>	zeer	648	<i>very</i>
zagt	<i>zacht</i>	109	<i>soft</i>	zucht	66	<i>sigh</i>

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**Practice Items**


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eent	eend	9	duck	blind	38	blind
flees	vlees	181	meat	boot	170	boat
fork	vork	21	fork	eens	2406	agreement
jeugt	jeugd	140	youth	flink	245	sturdy
moort	moord	64	murder	juist	931	correct
regts	rechts	158	right	kans	441	chance
sgelp	schlep	2	shell	koord	11	ccord
sorg	zorg	259	sorrow	nicht	16	niece
sgool	school	1171	school	slaaf	14	slave
trem	tram	34	tramway	straf	80	punishment
vend	vent	116	fellow	vest	13	vest
vilm	film	442	film	zwaar	289	heavy
zant	zand	72	sand			

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\* Words in italics are not in the task but are mentioned for clarification purposes.

## Words Phonological Decision Task

Non-Words	Pseudohomophones	Valid Word	Frequency	English Translation
begun	beerun	<i>beren</i>	5	bears
bekkur	bakkur	<i>bakker</i>	53	baker
bissun	binnun	<i>binnen</i>	1631	indoors
bortun	bogtun	<i>bochten</i>	11	curves
buidun	buitun	<i>buiten</i>	939	outdoors
daapun	daagun	<i>dagen</i>	930	days
deefun	deelun	<i>delen</i>	184	to share
doldur	dogtur	<i>dochter</i>	226	daughter
faudun	fautun	<i>fouten</i>	80	mistakes
gaalun	gaatun	<i>gaten</i>	222	holes
geetun	geefun	<i>geven</i>	1397	to give
haadun	haafun	<i>haven</i>	76	harbour
haapun	haalun	<i>halen</i>	810	to get
heutel	heuful	<i>heuvel</i>	39	hill
jaalun	jaagun	<i>jagen</i>	34	to hunt
kaagur	kaamur	<i>kamer</i>	551	room
koepun	koejun	<i>koeien</i>	111	cows
koogun	koopun	<i>kopen</i>	579	to buy
laamun	laakun	<i>laken</i>	15	sheet
laapun	laatun	<i>laten</i>	2131	let
loorun	loopun	<i>lopen</i>	958	to walk
maafun	maakun	<i>maken</i>	3137	to make
miggun	middun	<i>midden</i>	345	midst
moelur	moedur	<i>moeder</i>	1417	mother
moonun	moogun	<i>mogen</i>	649	to allow
morpun	morgun	<i>morgen</i>	1048	tomorrow
neerul	naagul	<i>nagel</i>	3	nail
noepun	noemun	<i>noemen</i>	483	to name
nuffer	nummur	<i>nummer</i>	366	number
pangur	pantur	<i>panter</i>	2	panther
poetur	poedur	<i>poeder</i>	7	powder

poonun	pootun	<i>poten</i>	45	legs
raatun	raadun	<i>raden</i>	46	to guess
raagun	raakun	<i>raken</i>	135	to hit
saarun	saamun	<i>samen</i>	887	together
soedul	soepul	<i>soepel</i>	19	lean
taagul	taaful	<i>tafel</i>	454	table
tukkel	tunnul	<i>tunnel</i>	48	tunnel
vaatur	vaadur	<i>vader</i>	1182	father
vaapun	vaarun	<i>varen</i>	45	sail
veisur	veifur	<i>vijfer</i>	27	pond
voenen	voelun	<i>voelen</i>	184	to feel
vorgun	volgun	<i>volgen</i>	222	to follow
waamun	waagun	<i>wagen</i>	79	car
waffur	wakkur	<i>wakker</i>	225	awake
weedun	weetun	<i>weten</i>	1717	to know
windur	wintur	<i>winter</i>	98	winter
zaanun	zaakun	<i>zaken</i>	544	business
zijtun	zijlun	<i>zeilen</i>	68	to sail
zildur	zilfur	<i>zilver</i>	37	silver

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**Practice Items**


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begun	bauwun	<i>bouwen</i>	254	to build
buuwun	buurun	<i>buren</i>	107	neighbours
deefun	deelun	<i>delen</i>	184	to share
geegul	geefun	<i>geven</i>	1397	to give
haakur	haalun	<i>halen</i>	810	to get
haldur	heldur	<i>helder</i>	119	clear
hoogun	hollun	<i>hollen</i>	15	to run
jaamun	jammur	<i>jammer</i>	544	pity
kaggun	kaggul	<i>kachel</i>	43	stove
koepun	koejun	<i>koeien</i>	111	cows
moelur	moedur	<i>moeder</i>	1417	mother
miggun	moogun	<i>mogen</i>	649	to allow
morpun	morgun	<i>morgen</i>	1048	tomorrow

nandun	nagtun	<i>nachten</i>	46	nights
peikun	peilun	<i>pijlen</i>	7	arrows
poonun	pootun	<i>poten</i>	45	legs
rokkul	rommul	<i>rommel</i>	24	mess
soedul	soepul	<i>soepel</i>	19	flexible
tukkel	tunnul	<i>tunnel</i>	48	tunnel
vagtug	vogtug	<i>vochtig</i>	30	moist
voenen	volgun	<i>volgen</i>	222	to follow
vorgun	voogul	<i>vogel</i>	53	bird
weekul	weetun	<i>weten</i>	1717	to know
woopun	woonun	<i>wonen</i>	471	to live
zaanun	zaakun	<i>zaken</i>	544	business

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\* Words in italics are not in the task but are mentioned for clarification purposes.



## APPENDIX B

Summary of results for wordlength effects for orthographical decision

Table B1. Wordlength effects for orthographical decision for ADHD, RD and ADHD by RD.

	Orthographical Decision Accuracy		Orthographical Decision Speed	
	$F(1,90)$	$\eta_p^2$	$F(1,90)$	$\eta_p^2$
Wordlength by ADHD	8.32	.08*	2.57	.02
Wordlength by RD	26.66	.23**	2.40	.02
Wordlength by ADHD by RD	1.29	.01	1.86	.02

*Note.* ADHD=Attention Deficit Hyperactivity disorder; RD=Reading Disorder

\* significant at  $p < .05$  level    \*\* significant at  $p < .01$  level.

## APPENDIX C

Results of multiple regression models predicting inhibition, visuospatial working memory and lexical processing

To test the possibility that findings were related to subclinical elevations in clinical scores of the other disorder (not reaching diagnostic values) than to the primary disorder, we conducted multiple hierarchical regression analyses where after entering IQ and age, inattention, hyperactivity (as measured with the DBD, combined teacher and parent scores) and technical reading (as measured by the OMT, number correct words) were regressed on either scores for inhibition, visuospatial WM or lexical decision accuracy, see Table C1 below. After IQ and age, the combination inattention, hyperactivity and technical reading contributed to inhibition. Inattention and technical reading but not hyperactivity were significant predictors in this contribution. Inattention, hyperactivity and technical reading did not contribute to visuospatial WM after IQ and age. The combination attention, hyperactivity and technical reading added to lexical decision after age and IQ. Technical reading but not inattention and hyperactivity were significant predictors in this contribution.

**APPENDIX C** *continued*

Table C1. Results of multiple regression models predicting inhibition, visuospatial working memory and lexical processing from ADHD symptoms and technical reading after the effects of age and IQ are controlled.

	Inhibition (SSRT)				Visuospatial Working Memory (Maximum Span)				Lexical Processing (d')				
	$\Delta R^2$	<i>p</i>	Beta	t	$\Delta R^2$	<i>p</i>	Beta	t	$\Delta R^2$	<i>p</i>	Beta	t	<i>p</i>
Age	-	-	-3.40	-3.42	.001**	.25	.25	3.02	.003**	-	.10	1.18	.24
IQ	-	-	-.18	-2.15	.03*	.33	.33	3.89	<.001**	-	.41	4.84	<.001**
Inattention			.43	2.29	.02*	NA	NA	NA	NA		-.19	-1.13	.26
Hyperactivity	.10	.002**	-.24	-1.32	.18	.02	.34	NA	NA	.19	<.001**	.07	.94
Technical Reading			.20	-2.10	.04*	NA	NA	NA	NA		.41	4.67	<.001**

Note. SSRT=Stop Signal Reaction Time

\* significant at  $p < .05$  level    \*\* significant at  $p < .01$  level.

## APPENDIX D

Results for interrelatedness of the included IIV measures

Table D1. Intercorrelations for speed and IIV measures for choice reaction speed.

Variable	MRT	Mu	Tau	SD	CV	Sigma	Total ISD	Fast ISD	Slow ISD
1. MRT	1.00								
2. Mu	.73**	1.00							
3. Tau	.47*	.26**	1.00						
4. SD	.62**	.16	.58**	1.00					
5. CV	.12	-.24**	.38**	.84**	1.00				
6. Sigma	.21	.51**	-.37**	.15	.06	1.00			
7. Total ISD	.45**	.17	.67**	.89**	.67**	.17	1.00		
8. Fast ISD	.55**	.47**	.25**	.49**	.23*	.37**	.56**	1.00	
9. Slow ISD	.56**	.08	.62**	.87**	.71**	.15	.95**	.42**	1.00

CV= Coefficient of Variation ISD=Intra-Individual Standard Deviation; Mean Reaction Time; SD=Standard Deviation

\*  $p < .05$  \*\* $p < .01$ .

Table D2. Intercorrelations for speed and IIV measures for inhibition.

Variable	MRT	Mu	Tau	SD	CV	Sigma	Total ISD	Fast ISD	Slow ISD
1. MRT	1.00								
2. Mu	.78**	1.00							
3. Tau	.35**	-.26**	1.00						
4. SD	.69**	.28**	.53**	1.00					
5. CV	.15	-.20*	.42**	.81**	1.00				
6. Sigma	.48**	.67**	-.25**	.29**	.03	1.00			
7. Total ISD	.47**	.29**	.51**	.97**	.77**	.34**	1.00		
8. Fast ISD	.52**	.45**	.57**	.34**	.43**	.14	.59**	1.00	
9. Slow ISD	.44**	.09	.85**	.80**	.18*	.41**	.87**	.44**	1.00

CV=Coefficient of Variation; ISD=Intra-Individual Standard Deviation; MRT = Mean Reaction Time; SD=Standard Deviation

\*  $p < .05$  \*\* $p < .01$ .

Table D3. Intercorrelations for speed and IIV measures for lexical processing.

Variable	MRT	Mu	Tau	SD	CV	Sigma	Total ISD	Fast ISD	Slow ISD
1. MRT	1.00								
2. Mu	.87**	1.00							
3. Tau	.44**	-.02	1.00						
4. SD	.77**	.46**	.60**	1.00					
5. CV	.12	-.18*	.39**	.70**	1.00				
6. Sigma	.66**	.77**	-.07	.53**	.10	1.00			
7. Total ISD	.72**	.43**	.56**	.54**	.71**	.54**	1.00		
8. Fast ISD	.82**	.76**	.62**	.08	.67**	.32**	.61**	1.00	
9. Slow ISD	.33**	.06	.70**	.75**	.12	.37**	.75**	.23*	1.00

CV=Coefficient of Variation; ISD=Intra-Individual Standard Deviation; MRT = Mean Reaction Time; SD=Standard Deviation

\*  $p < .05$  \*\*  $p < .01$ .

## APPENDIX E

Summary for results on MRT and mu

Table E1. Univariate effects of ADHD, RD and ADHD by RD for MRT and Mu.

	ADHD		RD		ADHD by RD	
	$F$	$\eta_p^2$	$F$	$\eta_p^2$	$F$	$\eta_p^2$
MRT	2.31	.02	7.84**	.06	4.78*	.04
Mu	.11	.00	2.20	.01	3.75 <sup>a</sup>	.03

ADHD=Attention Deficit Hyperactivity Disorder; RD=Reading Disorder; MRT=Mean Reaction Time

<sup>a</sup>  $p = .055$

\*  $p < .05$  \*\*  $p < .01$ .

