

Supplemental Table 2. Characteristics of studies with cognitive flexibility tasks.

Study	<i>N</i>		Age (mos.)		Language <i>M</i> (<i>SD</i>) ¹		EF task	Verbal loading	Outcome measure	Hedges's <i>g</i> (<i>SE</i>)	95% CI
	SLI	TD	SLI	TD	SLI	TD					
Switching tasks											
Beck Mutch, 2001	8	10	105	97	76 (12.57)	108 (9.38)	Trails task	V	Trails B time	0.10 (0.45)	−1.22, 1.42
Das & Åystö, 1994	60	163	170	146	81.4 (15.8)	—	Planned connections	V	Time to completion	0.19 (0.15)	−0.57, 0.95
Dibbets et al., 2006	4	7	82	82	6.5 ² (0.6)	11.57 ² (2.7)	Switch task	V	Switch cost in errors	0.40 (0.58)	−1.10, 1.89
							Switch task	V	Errors at switch	−1.02 (0.61)	−2.56, 0.51
							Switch task	V	Switch cost in RT	−0.15 (0.57)	−1.64, 1.33
							Switch task	V	RT at switch	−1.48 (0.66)	−3.07, 0.10
Farrant et al., 2012	30	30	63	63	—	—	DCCS: border version	N	Level passed	−0.71 (0.26)	−1.72, 0.29
Henry et al., 2012	41	88	138	118	3.8 ² (2.5)	10.5 ² (1.9)	Trails task	V	Switch cost in time	0.11 (0.19)	−0.74, 0.96
							Card sorting task: perceptual rule	N	Correct sorts	−0.56 (0.19)	−1.42, 0.30
							CANTAB: card sorting, nonverbal	N	Total errors	−0.22 (0.19)	−1.07, 0.63
							Card sorting: verbal rule	V	Correct sorts	−0.31 (0.19)	−1.16, 0.55
Im-Bolter, 2003	45	45	121	122	5.58 ² (1.94)	10.11 ² (1.65)	Children's Color Trail Test (Llorente et al., 2009)	V	Time ratio (Trail B: Trail A)	−0.04 (0.21)	−0.94, 0.86
							Children's Color Trail Test	V	Time difference between conditions	−0.46 (0.21)	−1.36, 0.44
							Set shifting task: compatible trials	V	Switch cost in RT	0.02 (0.21)	−0.88, 0.91
							Set shifting task: incompatible trials	V	Switch cost in RT	−0.07 (0.21)	−0.96, 0.83
							Set shifting task: compatible trials	V	Ratio score (switch: nonswitch trials)	0.09 (0.21)	−0.80, 0.99
							Set shifting task: incompatible trials	V	Ratio score (switch: nonswitch trials)	0.07 (0.21)	−0.82, 0.97
							Set shifting task: compatible trials	V	Switch cost in errors	0 (0.21)	−0.90, 0.90

Study	<i>N</i>		Age (mos.)		Language <i>M (SD)</i> ¹		EF task	Verbal loading	Outcome measure	Hedges's <i>g (SE)</i>	95% CI
	SLI	TD	SLI	TD	SLI	TD					
							Set shifting task: incompatible trials	V	Switch cost in errors	0.26 (0.21)	−0.64, 1.16
Kiernan et al., 1997	30	30	56	56	−5.12 ³ (1.81)	−0.05 ³ (1.22)	Shape sorting task	N	Trials to criterion at shift	−0.23 (0.26)	−1.22, 0.76
Victorino, 2011	15	15	128	130	81.1 (11.6)	112 (8.2)	Children's Color Trails Test	V	Time to completion (color & numbers)	−0.93 (0.38)	−2.13, 0.27
							Children's Color Trails Test	V	Switch cost in time	−0.41 (0.36)	−1.58, 0.76
Williams et al., 2000	10	10	72	72	9.2 ² (2.2)	12.5 ² (2.72)	Card sorting	N	Errors at shift	−0.10 (0.43)	−1.38, 1.19
Yang, 2015	19	28	57	57	77.09 (8.97)	106.6 (7.03)	DCCS adapted: linguistic	V	% correct after shift	−0.87 (0.31)	−1.96, 0.21
	12	28	57	57	77.09 (8.97)	106.6 (7.03)	DCCS adapted: nonlinguistic	N	% correct after shift	−0.95 (0.35)	−2.12, 0.22
Fluency tasks											
Beck Mutch, 2001	11	12	105	97	76 (12.57)	108 (9.38)	Phonemic fluency: FAS	V	Correct responses	−0.31 (0.40)	−1.27, 1.21
							Verbal fluency: animals	V	Correct responses	−0.14 (0.40)	−1.39, 1.10
							Verbal fluency: food	V	Correct responses	−0.06 (0.40)	−1.30, 1.18
Bishop & Norbury, 2005a	17	18	112	103	69.67 (11.64)	101.47 (10.01)	Verbal fluency: uses of objects	V	Total responses	0.31 (0.33)	−0.82, 1.44
							Verbal fluency: uses of objects	V	Correct responses	−0.32 (0.33)	−1.45, 0.81
							Verbal fluency: uses of objects	V	Repetitions	−0.47 (0.34)	−1.60, 0.66
							Verbal fluency: uses of objects	V	Redundant responses	−0.29 (0.33)	−1.42, 0.84
							Verbal fluency: uses of objects	V	"Not useful" responses	−0.43 (0.33)	−1.57, 0.70
							Verbal fluency: uses of objects	V	Incorrect responses	−0.53 (0.34)	−1.67, 0.61
							Verbal fluency: uses of objects	V	Unintelligible responses	0.08 (0.33)	−1.04, 1.21
							Verbal fluency: uses of objects	V	% correct	−0.90 (0.35)	−2.05, 0.26
							Verbal fluency: pattern meanings task	V	Total responses	0.78 (0.34)	−0.37, 1.93

Study	<i>N</i>		Age (mos.)		Language <i>M (SD)</i> ¹		EF task	Verbal loading	Outcome measure	Hedges's <i>g</i> (<i>SE</i>)	95% CI
	SLI	TD	SLI	TD	SLI	TD					
							Verbal fluency: pattern meanings task	V	Correct responses	0.86 (0.35)	−0.30, 2.01
							Verbal fluency: pattern meanings task	V	Repetitions	−0.37 (0.33)	−1.50, 0.77
							Verbal fluency: pattern meanings task	V	Redundant responses	−0.34 (0.33)	−1.47, 0.79
							Verbal fluency: pattern meanings task	V	Incorrect responses	−0.49 (0.33)	−1.62, 0.63
							Verbal fluency: pattern meanings task	V	Unscoreable responses	−0.51 (0.34)	−1.65, 0.63
							Verbal fluency: pattern meanings task	V	% correct	−0.47 (0.34)	−1.60, 0.67
							Verbal fluency: pattern meanings task	V	% correct	−0.47 (0.34)	−1.60, 0.67
Dunn et al., 1996	10	10	75	59	70.2 (26.56)	70.9 ⁴ (24.95)	Semantic fluency	V	Standard score	−0.02 (0.43)	−1.30, 1.27
							Semantic fluency	V	Correct response	0.36 (0.43)	−0.93, 1.64
							Semantic fluency	V	Perseverations	−0.76 (0.45)	−2.06, 0.55
							Semantic fluency	V	Intrusions	0 (0.43)	−1.28, 1.28
							Semantic fluency	V	% correct	−0.51 (0.44)	−1.80, 0.79
							Semantic fluency	V	% perseverations	−0.57 (0.44)	−1.87, 0.72
							Semantic fluency	V	% intrusions	0.21 (0.43)	−1.08, 1.49
Hall & Jordan, 1987, Sample A	19	48	88	73	—	—	Semantic fluency	V	Total responses	−0.38 (0.27)	−1.40, 0.64
Hall & Jordan, 1987, Sample B	25	32	91	87	—	—	Semantic fluency	V	Total responses	−0.73 (0.27)	−1.75, 0.30
Hall & Jordan, 1987, Sample C	23	38	105	99	—	—	Semantic fluency	V	Total responses	−0.03 (0.26)	−1.03, 0.97
Hall & Jordan, 1987, Sample D	23	31	109	110	—	—	Semantic fluency	V	Total responses	−0.13 (0.27)	−1.15, 0.89
Hall & Jordan, 1987, Sample E	11	36	130	122	—	—	Semantic fluency	V	Total responses	−0.65 (0.35)	−1.80, 0.51
Hall & Jordan, 1987, Sample F	8	26	136	131	—	—	Semantic fluency	V	Total responses	−0.26 (0.40)	−1.49, 0.98

Study	<i>N</i>		Age (mos.)		Language <i>M (SD)</i> ¹		EF task	Verbal loading	Outcome measure	Hedges's <i>g</i> (<i>SE</i>)	95% CI
	SLI	TD	SLI	TD	SLI	TD					
Hall & Jordan, 1987, Sample G	5	28	152	145	—	—	Semantic fluency	V	Total responses	0.58 (0.48)	−0.78, 1.93
Hall & Jordan, 1987, Sample H	3	20	161	160	—	—	Semantic fluency	V	Total responses	−1.62 (0.64)	−3.19, −0.05
Henry et al., 2012	41	88	138	118	3.8 ² (2.5)	10.5 ² (1.9)	Design fluency	N	Mean # unique designs	−0.14 (0.19)	−0.99, 0.71
							Verbal fluency: phonemic & semantic	V	Mean # responses	−0.99 (0.20)	−1.86, −0.12
Lukács et al., 2015	31	31	94	94	17.9 ⁵ (9.31)	35.35 ⁵ (6.35)	Verbal fluency	V	Correct responses	−0.77 (0.26)	−1.77, 0.23
							Verbal fluency	V	Errors	−0.26 (0.25)	−1.24, 0.73
							Nonverbal fluency	N	Correct responses	0.22 (0.25)	−0.77, 1.20
							Nonverbal fluency	N	Errors	0.26 (0.25)	−0.73, 1.24
Marshall et al., 2013	10	12	130	130	84.23 (19.67)	—	Verbal fluency	V	Total responses	−0.39 (0.42)	−1.65, 0.88
							Verbal fluency	V	Correct responses	−0.51 (0.42)	−1.78, 0.76
							Verbal fluency	V	Repeated responses	0.37 (0.42)	−0.90, 1.63
							Verbal fluency	V	Irrelevant responses	−0.42 (0.42)	−1.69, 0.84
							Verbal fluency	V	Uninterpretable responses	−0.49 (0.42)	−1.76, 0.78
							Verbal fluency	V	Responses in 1–15 s	−1.12 (0.45)	−2.42, 0.19
							Verbal fluency	V	Responses in 16–30 s	0.24 (0.41)	−1.02, 1.50
							Verbal fluency	V	Responses in 31–45 s	−0.42 (0.42)	−1.69, 0.84
							Verbal fluency	V	Responses in 46–60 s	0.24 (0.41)	−1.02, 1.50
							Verbal fluency	V	Clusters	−0.15 (0.41)	−1.41, 1.11
							Verbal fluency	V	Average cluster size	−0.17 (0.41)	−1.43, 1.09
							Verbal fluency	V	Switches	−0.46 (0.42)	−1.72, 0.81
Weckerly et al., 2001	24	28	113	114	—	—	Semantic fluency	V	Total responses	−0.55 (0.28)	−1.59, 0.48

Study	<i>N</i>		Age (mos.)		Language <i>M (SD)</i> ¹		EF task	Verbal loading	Outcome measure	Hedges's <i>g (SE)</i>	95% CI
	SLI	TD	SLI	TD	SLI	TD					
							Semantic fluency	V	Valid responses	−0.68 (0.28)	−1.72, 0.36
							Semantic fluency	V	Errors	−0.24 (0.28)	−1.27, 0.78
							Semantic fluency	V	Cluster size	0.18 (0.28)	−0.84, 1.21
							Semantic fluency	V	Switches	−0.40 (0.28)	−1.43, 0.63
							Phonemic fluency	V	Total responses	−0.54 (0.28)	−1.58, 0.49
							Phonemic fluency	V	Valid responses	−0.77 (0.28)	−1.82, 0.27
							Phonemic fluency	V	Errors	−0.30 (0.28)	−1.33, 0.73
							Phonemic fluency	V	Cluster size	0.25 (0.28)	−0.78, 1.27
							Phonemic fluency	V	Switches	−0.55 (0.28)	−1.59, 0.48
Weyandt & Willis, 1994	34	45	103	108	28.41 ⁶ (8.47)	39.15 ⁶ (6.58)	Verbal fluency	V	Correct responses	−0.29 (0.23)	−1.22, 0.65
WCST											
Cane, 2007	29	685	132	144 ⁷	—	—	WCST	N	Perseverations	−0.80 (0.19)	−1.65, 0.06
Hughes, 2006	18	18	173	175	71 (14.1)	—	WCST	N	Total errors	−0.90 (0.34)	−2.05, 0.25
Hughes et al., 2009	21	21	168	170	70 (13.1)	—	WCST	N	Total errors	−0.83 (0.32)	−1.93, 0.27
Liss et al., 2001	34	80	109	114 ⁷	97.2 (12.8)	—	WCST	N	Perseverative errors	−0.05 (0.21)	−0.84, 0.93
Marton, 2008, Sample B	25	25	117	118	71.57 ⁸ (16.74)	92.49 ⁸ (6.78)	WCST	N	Total errors	−1.16 (0.30)	−2.24, −0.09
							WCST	N	Perseverative errors	−0.88 (0.29)	−1.94, 0.18
							WCST	N	Concept level score	−1.07 (0.30)	−2.14, 0.00
Weyandt & Willis, 1994	34	45	103	108	28.41 ⁶ (8.47)	39.15 ⁶ (6.58)	WCST	N	Errors	0.15 (0.23)	−0.78, 1.08
							WCST	N	Perseverations	−0.10 (0.23)	−1.03, 0.83

Note. SLI = specific language impairment; TD = typically developing; EF = executive function; V = verbal; N = nonverbal; DCCS = Dimensional Change Card Sort (Zelazo, 2006); CANTAB = Cambridge Neuropsychological Test Automated Battery (Robbins et al., 1994); WCST = Wisconsin Card Sorting Test (Heaton, Chelune, Talley, Kay, & Curtis, 1993); — = data not collected.

¹Standardized around M=100, SD=15 unless otherwise noted. ²Standardized around M=10, SD=3. ³Standard deviations below the mean. ⁴Groups matched on receptive vocabulary.

⁵Raw score from sentence repetition test. ⁶Number of correctly identified pictures. ⁷Information about TD group taken from norming study (Paniak et al., 1996). ⁸Percent correct.

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