

AGE AND COHORT EFFECTS IN COGNITIVE

BEHAVIOR: A COHORT SEQUENTIAL

REPLICATION

Christopher Hertzog, K. Warner Schaie, and Kathy Gribbin

Table 1

Data Set	Mean Ages	Mean Birth Years	N_1 (m)	N_1 (F)	N_2 (M)	N_2 (F)	Total N
I	25,32	1938,1945	9	26	10	24	69
II	32,39	1931,1938	23	38	14	22	97
III	39,46	1924,1931	36	43	17	28	124
IV	46,53	1917,1924	36	37	28	26	127
V	53,60	1910,1917	29	45	24	29	127
VI	60,67	1903,1910	19	22	21	25	87
VII	67,74	1896,1903	19	24	18	16	77
VIII	74,81	1889,1896	8	13	6	17	44*

* 2 subjects with some missing data

N_1 = Number of subjects; 1963, 1970 sample

N_2 = Number of subjects; 1970, 1977 sample

Table 2
Verbal Meaning

Data Set	Mean Birth Years	Mean Ages	Cohort F	Mean Diff.	Age F	Mean Diff.	CxA F
I	1938,1945	25,32	1.14	-2.08	7.37 ^{**}	+1.17	<1
II	1931,1938	32,39	1.04	+ .73	14.37 ^{**}	+1.66	<1
III	1924,1931	39,46	1.32	-1.65	6.43	+1.16	3.00
IV	1917,1924	46,53	<1	+ .85	3.61	+ .71	<1
V	1910,1917	53,60	3.54	+2.53	3.21	- .82	3.03
+VI	1903,1910	60,67	4.33 [*]	+2.99	1.35	- .85	1.05
VII	1896,1903	67,74	<1	-1.16	18.32 ^{***}	-3.22	3.17
VIII	1889,1896	74,81	2.22	-2.84	1.71	-2.03	1.27

+ Sex x Cohort interaction (F = 10.77, p .01).

F = F ratio, Mean diff. = mean diff. in T score points (for cohort, positive sign is higher level for later birth year; for age, positive sign is gain over time)

* p .05

** p .01

*** p .001

Table 3
Space

Data Set	Mean Birth Years	Mean Ages	Cohort F	Mean	Age F	Mean	Sex F	CxA F
I	1938,1945	25,32	3.38	-3.79	1.08	+ .74	5.86 [*]	4.66 [*]
II	1931,1938	32,39	3.19	+2.94	2.39	+ .84	8.91 ^{**}	1.00
III	1924,1931	39,46	<1	+ .76	<1	+ .50	13.77 ^{***}	<1
IV	1917,1924	46,53	<1	+ .99	<1	+ .13	15.95 ^{***}	<1
V	1910,1917	53,60	1.48	+1.72	<1	+ .06	9.00 ^{**}	<1
VI	1903,1910	60,67	1.50	+1.66	11.85 ^{***}	-3.31	9.83 ^{**}	<1
VII	1896,1903	67,74	<1	- .97	14.73 ^{***}	-2.68	11.06 ^{***}	1.38
VIII	1889,1896	74,81	<1	-1.71	16.33 ^{***}	-3.12	<1	<1

Table 4

Reasoning

Data Set	Mean Birth Years	Mean Ages	Cohort		Age		CxA F
			F	Mean	F	Mean	
I	1938,1945	25,32	<1	- .89	<1	+ .74	2.52
II	1931,1938	32,39	1.41	+1.95	<1	+ .68	1.72
III	1924,1931	39,46	<1	+ .18	<1	+ .34	<1
IV	1917,1924	46,53	3.69	+2.45	<1	- .41	<1
V	1910,1917	53,60	4.55*	+3.08	1.56	+ .60	<1
VI	1903,1910	60,67	5.55*	+3.08	17.43***	-2.26	1.61
VII	1896,1903	67,74	<1	+ .48	12.04***	-2.12	<1
VIII	1889,1896	74,81	<1	-1.04	3.99	-1.81	<1

Table 5

Number

Data Set	Mean Birth Years	Mean Ages	Cohort		Age		Sex	CxA
			F	Mean	F	Mean		
I	1938,1945	25,32	<1	-1.16	2.37	+ .68	<1	<1
II	1931,1938	32,39	<1	+ .90	3.92*	- .80	8.17**	4.51*
III	1924,1931	39,46	<1	- .73	<1	- .11	<1	<1
IV	1917,1924	46,53	2.51	+2.29	1.67	- .50	2.08	1.48
V	1910,1917	53,60	<1	+ .86	<1	- .13	1.44	10.10**
VI	1903,1910	60,67	6.05*	+5.10	10.75**	-2.02	1.45	<1
VII	1896,1903	67,74	<1	+ .19	14.37***	-2.96	<1	<1
VIII	1889,1896	74,81	<1	+ .11	20.05***	-4.00	<1	4.03*

Table 6

Word Fluency

Data Set	Mean Birth Year	Mean Age	Cohort		Age		Sex	CxA
			F	Mean diff.	F	Mean diff.		
I	1938,1945	25,32	4.09*	2.84	2.53	+1.78	3.80	<1
II	1931,1938	32,39	<1	-1.84	2.04	+ .98	3.89*	1.49
III	1924,1931	39,46	<1	+1.07	12.68 ^{***}	+2.08	<1	<1
IV	1917,1924	46,53	7.33 ^{**}	+3.88	<1	- .02	1.33	10.17 ^{**}
V	1910,1917	53,60	3.65	+2.72	<1	- .24	<1	2.33
VI	1903,1910	60,67	<1	- .05	5.21 [*]	-2.83	18.10 ^{***}	23.50 ^{***}
VII	1896,1903	67,74	1.04	-2.51	2.30	-1.07	2.51	1.21
VIII	1889,1896	74,81	3.74	-4.29	21.10 ^{***}	-3.56	<1	2.48

Table 7

Intellectual Ability (Composite IQ)

Data Set	Mean Birth Year	Mean Age	Cohort		Age		CxA
			F	Mean diff.	F	Mean diff.	
I	1938,1945	25,32	<1	-1.22	5.89	+1.24	2.57
II	1931,1938	32,39	<1	1.36	<1	+ .59	1.74
III	1924,1931	39,46	<1	- .25	4.45 [*]	+ .75	<1
IV	1917,1924	46,53	5.43*	+2.82	<1	- .20	<1
V	1910,1917	53,60	2.90	+1.95	<1	- .18	9.36 ^{**}
+VI	1903,1910	60,67	7.15 ^{**}	+3.87	21.75 ^{***}	-2.40	<1
VII	1896,1903	67,74	<1	- .83	32.51 ^{***}	-2.99	<1
VIII	1889,1896	74,81	1.22	-2.27	28.35 ^{**}	-2.83	<1

+ PS VI, Sex x Cohort interaction (F = 7.10, p .01).

Table 1

Data Set	Mean Ages	Mean Birth Years	$N_1(M)$	$N_1(F)$	$N_2(M)$	$N_2(F)$	Total N
I	25, 32	1938, 1945	9	26	10	24	69
II	32, 39	1931, 1938	23	38	14	22	97
III	39, 46	1924, 1931	36	43	17	28	124
IV	46, 53	1917, 1924	36	37	28	26	127
V	53, 60	1910, 1917	29	45	24	29	127
VI	60, 67	1903, 1910	19	22	21	25	87
VII	67, 74	1896, 1903	19	24	18	16	77
VIII	74, 81	1889, 1896	8	13	6	17	44*

* 2 subjects with some missing data

N_1 = Number of subjects; 1963, 1970 sample

N_2 = Number of subjects; 1970, 1977 sample

Table 2
Verbal Meaning

Data Set	Mean Birth Years	Mean Ages	Cohort		Age		C x A
			F	Mean Diff	F	Mean Diff	F
I	1938, 1945	25, 32	1.14	-2.08	7.37**	+1.17	<1
II	1931, 1938	32, 39	1.04	+1.73	14.37**	+1.66	<1
III	1924, 1931	39, 46	1.32	-1.65	6.43*	+1.16	3.00
IV	1927, 1924	46, 53	<1	+1.85	3.61	+1.71	<1
V	1910, 1917	53, 60	3.54	+2.53	3.21	-.82	3.03
+ VI	1903, 1910	60, 67	4.33*	+2.99	1.35	-.85	1.05
VII	1896, 1903	67, 74	<1	-1.16	18.32***	-3.22	3.17
VIII	1889, 1896	74, 81	2.22	-2.84	1.71	-2.03	1.27

+ Sex x Cohort interaction ($F = 10.77, p < .01$).

F = F ratio, Mean diff. = mean difference^{in T score points} (for cohort, positive sign is higher level for later birth year; for age, positive sign is gain over time)

* $p < .05$

** $p < .01$

*** $p < .001$

Table 3
Space

Data Set	Mean Birth Years	Mean Ages	Cohort		Age		Sex CxA	
			F	Mean diff	F	Mean diff	F	F
I	1938, 1945	25, 32	3.38	-3.79	1.08	+7.4	5.86*	4.66*
II	1931, 1938	32, 39	3.19	+2.94	2.39	+8.4	8.91**	1.00
III	1924, 1931	39, 46	<1	+7.6	<1	+5.0	13.77***	<1
IV	1917, 1924	46, 53	<1	+9.9	<1	+1.3	15.95***	<1
V	1910, 1917	53, 60	1.48	+1.72	<1	+0.6	9.00**	<1
VI	1903, 1910	60, 67	1.50	+1.66	11.85***	-3.31	9.83**	<1
VII	1996, 1903	67, 74	<1	-9.7	14.73***	-2.68	11.06***	1.38
VIII	1889, 1896	74, 81	<1	-1.71	16.33***	-3.12	<1	<1

Table 4
Reasoning

Data Set	Mean Birth Years	Mean Ages	Cohort		Age		C x A F
			F	Mean Diff.	F	Mean Diff.	
I	1938, 1945	25, 32	<1	-.89	<1	+ .74	2.52
II	1931, 1938	32, 39	1.41	+1.95	<1	+ .68	1.72
III	1924, 1931	39, 46	<1	+ .18	<1	+ .34	<1
IV	1917, 1924	46, 53	3.69	+2.45	<1	-.41	<1
V	1910, 1917	53, 60	4.55 [*]	+3.08	1.56	+ .60	<1
VI	1903, 1910	60, 67	5.55 [*]	+3.08	17.43 ^{***}	-2.26	1.61
VII	1896, 1903	67, 74	<1	+ .48	12.04 ^{***}	-2.12	<1
VIII	1889, 1896	74, 81	<1	-1.04	3.99	-1.81	<1

Table 5
Number

Data Set	Mean Birth Year	Mean Ages	Cohort		Age		Sex	CxA
			F	Mean Diff.	F	Mean Diff.		
I	1938, 1945	25, 32	<1	-1.16	2.37	+1.68	<1	<1
II	1931, 1938	32, 39	<1	+1.90	3.92*	-.80	8.17**	4.51*
III	1924, 1931	39, 46	<1	-.73	<1	-.11	<1	<1
IV	1917, 1924	46, 53	2.51	+2.29	1.67	-.50	2.08	1.48
V	1910, 1917	53, 60	<1	+1.86	<1	-.13	1.44	10.10**
VI	1903, 1910	60, 67	6.05*	+5.10	10.75**	-2.02	1.45	<1
VII	1896, 1903	67, 74	<1	+1.19	14.37***	-2.96	<1	<1
VIII	1889, 1896	74, 81	<1	+1.11	20.05***	-4.00	<1	4.03*

Table 6
Word Fluency

Data Set	Mean Birth Year	Mean Age	Cohort		Age		Sex CxA	
			F	Mean Diff	F	Mean Diff	F	F
I	1938, 1945	25, 32	4.09 [*]	2.84	2.53	+1.78	3.80	<1
II	1931, 1938	32, 39	<1	-1.84	2.04	+ .98	3.89 [*]	1.44
III	1924, 1931	39, 46	<1	+1.07	12.68 ^{***}	+2.08	<1	<1
IV	1917, 1924	46, 53	7.33 ^{**}	+3.88	<1	- .02	1.33	10.17 ^{**}
V	1910, 1917	53, 60	3.65	+2.72	<1	- .24	<1	2.33
VI	1903, 1910	60, 67	<1	- .05	5.21 [*]	-2.83	18.10 ^{***}	23.50 ^{***}
VII	1896, 1903	67, 74	1.04	-2.51	2.30	-1.07	2.51	1.21
VIII	1889, 1896	74, 81	3.74	-4.29	21.10 ^{**}	-3.56	<1	2.48

Table 7
Intellectual Ability
(Composite IQ)

Data Set	Mean Birth Year	Mean Age	Cohort		Age		C x A
			F	Mean diff	F	Mean diff	
I	1938, 1945	25, 32	< 1	-1.22	5.89*	+1.24	2.57
II	1931, 1938	32, 39	< 1	1.36	< 1	+5.9	1.74
III	1924, 1931	39, 46	< 1	-.25	4.45*	+7.5	< 1
IV	1917, 1924	46, 53	5.43*	+2.82	< 1	-.20	< 1
V	1910, 1917	53, 60	2.90	+1.95	< 1	-.18	9.36**
+ VI	1903, 1910	60, 67	7.15**	+3.87	21.75***	-2.40	< 1
VII	1896, 1903	67, 74	< 1	-.83	32.51***	-2.99	< 1
VIII	1889, 1896	74, 81	1.22	-2.27	28.35**	-2.83	< 1

+ DS VI, Sex x Cohort interaction (F=7.10, p<.01).