

FATIGUE AND INTELLECTUAL PERFORMANCE IN THE AGED

Carol A. Furry  
Department of Psychology  
Clemson University  
Clemson, South Carolina

and

K. Warner Schaie  
Ethel Percy Andrus Gerontology Center  
University of Southern California  
Los Angeles, California

ABSTRACT

The hypothesis was that a portion of the age decrement in intellectual performance may result from the differential effects of pretest fatigue. The hypothesis was investigated in a sample of elderly individuals aged 50-61 (pre-retirement, N=45) and 62-72 post-retirement, N=45), with the Primary Mental Abilities Test as the standardized intelligence test. Three pretest conditions were used: (a) physical fatigue, (b) mental + physical fatigue, and (c) no fatigue control. Analyses of variance and multivariate analyses of variance revealed significant main effects of age or cohort and sex, but no significant differences due to pretest treatment. The possible sources of age and cohort differences are discussed, including both psychological and physiological variables. It is possible that fatigue proneness is a trait common to the elderly which is not sensitive to differences in source (mental vs. physical) or amount, but which may differ only according to age or cohort.

## RESULTS

Table 1 summarizes the analyses of variance of the five Primary Mental Abilities factors. The results of the multivariate analysis of variance are summarized in Table 2.

The pre-retirement group was superior to the post-retirement group on all five PMA factors, and the difference was significant on all except Word Fluency. Sex had a significant effect only on Space, on which males outperformed females. No other effects were reliable in any of the analyses. Thus, the manipulated conditions did not influence performance.

Multivariate analysis of variance results supported the results of the analysis of variance with respect to age or cohort differences, and sex differences.

TABLE 1  
Summary of Analyses of Variance: Significant F Values

Source	PIA Subtest									
	Verbal Meaning		Space		Reasoning		Number		Word Fluency	
	df	F	df	F	df	F	df	F	df	F
Age (A)	1	10.54*	1	15.38*	1	11.78*	1	9.00*	1	1.34
Sex (S)	1	.43	1	7.55*	1	1.12	1	3.44	1	.03
Fatigue (F)	2	.35	2	.61	2	.04	2	.31	2	.48
A X S	1	.41	1	.22	1	1.46	1	.10	1	.26
A X F	2	1.15	2	.10	2	.23	2	1.12	2	.36
F X S	2	2.36	2	.09	2	.47	2	.32	2	.57
A X F X S	2	.74	2	.57	2	.78	2	.83	2	.60

Note. Separate ANOVAs were conducted for each factor. Total N=90.

\*p. < .01

TABLE 2

Multivariate Analysis of Variance Test Criteria  
for Overall Effects

Source	Hotelling-Lawley's Trace		Pillai's Trace	
	df	F	df	F
Age (A)	74	4.33**	74	4.33**
Sex (S)	74	2.87*	74	2.87*
Fatigue (F)	146	.78	150	.81
A X S	74	1.65	74	1.65
A X F	146	.58	150	.59
F X S	146	1.38	150	1.36
A X F X S	146	.30	150	.30

Note. Total N=90.

\* p. .05

\*\* p. .01