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See also: Cognitive Development; Emotional Development; Personality Development

ADULT INTELLECTUAL DEVELOPMENT

Why do some individuals retain their behavioral competence well into advanced old age, whereas others show early decline? This question has long been a central topic in the psychology of adult development and aging. Five central questions and relevant research findings address this issue: (1) Does intelligence change uniformly through adulthood or are there different life-course ability patterns? (2) At what age is there a reliably detectable decrement in ability, and what is the magnitude of that decrement? (3) What are the patterns of generational differences, and what are their magnitudes? (4) What accounts for individual differences in age-related changes in adulthood; and (5) Can cognitive decline in old age be reversed?

The Measurement of Adult Intelligence

Most large-scale studies of adult intelligence conducted during the past few decades have used either the Wechsler

Adult Intelligence Scale (WAIS; Wechsler, 1939), one of its derivatives, or a derivative of Thurstone's (1935) work on the primary mental abilities. Findings of these studies differ markedly, however, depending on whether age comparisons have been made cross-sectionally or whether the same individuals have been followed longitudinally over time.

Differential Patterns of Change

There is no uniform pattern of age-related changes across all intellectual abilities. Studies of overall intellectual ability (IQ) are therefore insufficient to monitor age changes and age differences in intellectual functioning for either individuals or groups. Age-difference work with the WAIS suggests that verbal abilities are maintained well, whereas performance tests show early age differences favoring younger adults (Matarazzo, 1972). Longitudinal data on the WAIS also show high levels of stability of verbal behavior into advanced old age, while performance scores begin to decline in midlife. Studies of Primary Mental Abilities indicate that active or fluid abilities tend to decline earlier than passive or crystallized abilities. These findings are complicated by ability, gender, ability-by-age, and ability-by-cohort interactions. For example, women tend to decline earlier in the active abilities, whereas men decline sooner on crystallized abilities. Although fluid abilities begin to decline earlier, crystallized abilities appear to show steeper decrement once the late 70s are reached.

Age Level and Magnitude of Age-Related Intellectual Decline

Cross-sectional studies with the WAIS suggest that significant age differences favoring young adults can be found by the 30s for performance tests and by the 60s for verbal tests. These differences, however, confound cohort effects in education and health status. By contrast, in longitudinal studies, reliably replicable average age decrements in intellectual abilities are rarely found before age 60 but are observed for all intellectual functions at least by age 74. Analyses of individual differences in intellectual change, however, demonstrate that even at age 81 less than half of all observed individuals showed reliable decremental change over the preceding seven years. An example of trajectories for six abilities taken from the Seattle Longitudinal Study (Schaie, 2005) is provided in Figure 1.

Generational Differences

The existence of generational (cohort) differences in intellectual abilities has been conclusively demonstrated. Almost linear positive cohort shifts have been observed for inductive reasoning, with more spasmodic positive shifts for verbal ability and spatial orientation. A curvilinear

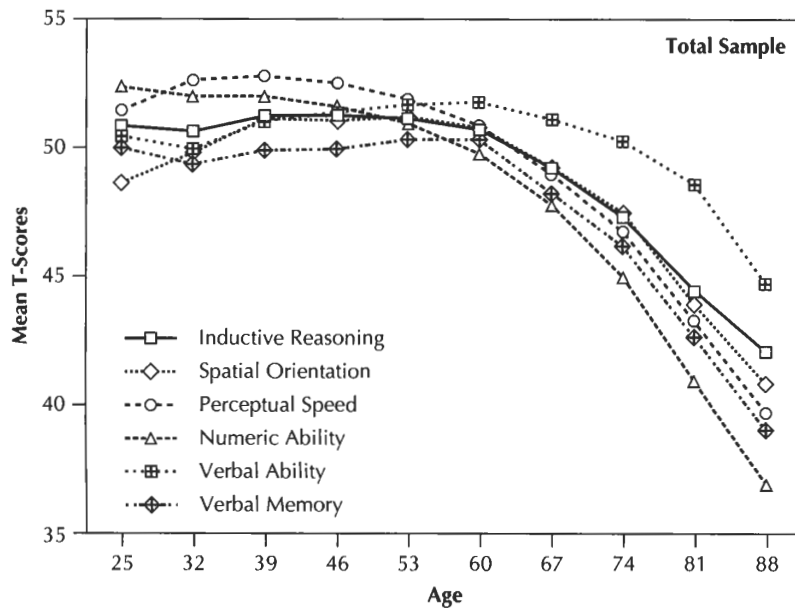


Figure 1. Longitudinal age changes in adulthood on six latent intellectual abilities. From K. W. Schaie, 2005.

cohort pattern has been found for number skills, which reach a peak for birth cohorts in the 1920s and then follow a largely negative slope. A similar curvilinear cohort pattern also has been observed for word fluency. As a consequence, cross-sectional studies of intellectual aging underestimate age changes before age 60 for abilities with negative cohort gradients and overestimate age changes for abilities with positive cohort gradients.

Individual Differences in Age-Related Change in Adulthood

Individual differences are large at all ages, such that substantial overlap among samples can be found from young adulthood into the mid-70s (Schaie, 2005). Very few individuals decline on all or most abilities. Indeed, maintaining functioning of one or more abilities is common for most individuals well into advanced old age. A number of factors account for individual differences in decline, some of which have been shown to be amenable to experimental intervention. Predictors of favorable cognitive aging include (1) absence of cardiovascular and other chronic diseases; (2) favorable environment as indicated by high SES; (3) involvement in a complex and intellectually stimulating environment; (4) flexible personality style at midlife; (5) high cognitive status of spouse; and (6) maintaining one's level of perceptual processing speed.

Reversibility of Cognitive Decline

Present understanding of individual differences in cognitive decline suggests that unless neurological pathology is present, cognitive interventions may serve to prevent known intellectual decline and reduce cohort differences

in individuals who have remained stable in their own performance over time but have become disadvantaged compared with younger peers. The effectiveness of cognitive interventions has been demonstrated in various laboratory studies as well as in a recent major clinical trial (Willis et al., 2007). Cognitive decline in many older people may well be the result of disuse of specific skills and can be reversed by appropriate training regimens. In two studies, approximately 66% of the experimental subjects showed significant improvement, and about 40% of those who had declined significantly over 14 years were returned to the pre-decline level (Schaie, 2005).

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See also: Aging and Intelligence; Primary Mental Abilities