

## 600 Instrumental Activities of Daily Living

- Kane, R., Bell, R., Reigler, S., Wilson, A., & Keeler, E. (1983). Predicting the outcomes of nursing home patients. *Gerontologist*, 23(2), 200-206.
- Kiely, D., Morris, J., & Morris, S. (1997). The effect of specific medical conditions on function decline. *Journal of the American Geriatrics Society*, 45, 1459-1463.
- Lawton, M. P. (1980). *Environment and aging*. Monterey, CA: Brooks/Cole.
- Liang, J., Liu, X., Tu, E., & Witelaw, N. (1996). Probabilities and lifetime durations of short-stay hospital and nursing home use in the United States, 1985. *Medical Care*, 34(10), 1018-1036.
- McAuley, W., & Travis, S. (1997). Positions of influence in the nursing home admission decision. *Research on Aging*, 19(1) 26-45.
- McAuley, W., & Usita, P. (1998). Conceptual model for the mobility patterns of nursing home admissions. *Gerontologist*, 38(6), 726-734.
- Miller, S., Prohaska, T., Runer, S., Freels, S., Brody, J., & Levy, P. (1998). Time to nursing home admission for persons with Alzheimer's disease: The effect of health care system characteristics. *Journals of Gerontology*, 53B(6), S341-S353.
- Morris, J., Sherwood, S., & Mor, V. (1984). Assessment tool for use in identifying functionally vulnerable persons in the community. *Gerontologist*, 24(4), 373-379.
- Murtaugh, C., Kemper, P., & Spillman, B. (1990). The risk of nursing home use in later life. *Medical Care*, 28, 10.
- National Center for Health Statistics. (1997). An overview of nursing homes and their current residents: Data from the 1995 National Nursing Home Survey. *Advance Data from Vital and Health Statistics*, No. 280. Bethesda, MD: National Center for Health Statistics.
- Patchner, M. A., & Balgopal, P. R. (1993). *Excellence in nursing homes*. New York: Springer Publishing.
- Payette, H., Coulombe, C., Boutier, V., & Gray-Donald, K. (2000). Nutrition risk factors for institutionalization in a free-living functionally dependent elderly population. *Journal of Clinical Epidemiology*, 53, 579-587.
- Reker, G. (2001-2002). Prospective predictors of successful aging in community-residing and institutionalized Canadian elderly. *Ageing International*, 27(1) 42-64.
- Rowland, M., Burns, B., Schafft, G., & Randolph, F. (1997). Innovative services for elderly populations. In S. Henggeler & A. Santos (Eds.), *Innovative approaches for difficult-to-treat populations* (pp. 289-310). Washington, DC: American Psychiatric Press.
- Savishinsky, J. S. (1991). *The ends of time: Life and work in a nursing home*. New York: Bergin and Garvey.
- Schimer, M. R., & Kahana, J. S. (1992). *Legal issues in the care of older adults*. Cleveland, OH: Western Reserve Geriatric Education Center, CWRU School of Medicine.
- Schulz, R., Belle, S., Czaja, S., McGinnis, K., Stevens, A., Zhang, S. (2004). Long-term care placement of dementia patients and caregiver health and well-being. *Journal of the American Medical Association*, 292(8), 961-967.
- Smyer, M., Shea, D., & Streit, A. (1994). The provision and use of mental health services in nursing homes: Results from the National Medical Expenditure Survey. *American Journal of Public Health*, 84, 284-287.
- Soth, N. B. (1997). *Informed treatment: Milieu management in psychiatric hospitals and residential treatment centers*. Lanham, MD: Medical Library Association/Scarecrow Press.
- Spector, W., Reschovsky, J., & Cohen, J. (1996). Appropriate placement of nursing-home residents in lower levels of care. *Milbank Quarterly*, 74(1), 139-160.
- Thomas, W. (1996). *Life worth living: How someone you love can still enjoy life in a nursing home. The Eden alternative in action*. Acton, MA: VanderWyk and Burnham.
- Thorson, J., & Davis, R. (2000). Relocation of the institutionalized aged. *Journal of Clinical Psychology*, 56(1), 131-138.
- Woo, J., Ho, S., Yu, A., & Lau, J. (2000). An estimate of long-term care needs and identification of risk factors for institutionalization among Hong Kong Chinese aged 70 years and over. *Journals of Gerontology Series A Biological Sciences and Medical Sciences*, 55, M64-M69.
- Yaffe, K., Fox, P., Newcomer, R., Sands, L., Lindquist, K., Dane, K., & Covinsky, K. (2002). Patient and caregiver characteristics and nursing home placement in patients with dementia. *Journal of the American Medical Association*, 287(16), 2090-2097.

## INSTRUMENTAL ACTIVITIES OF DAILY LIVING

See

Activities of Daily Living

## INTELLIGENCE

Maintaining intellectual competence assumes major importance for the quality of life of many older persons. Assessment of intellectual competence is often required to provide information relevant to

questions of retirement for cause (in the absence of mandatory retirement at an early age), sufficient competence for independent living, or for the control and disposition of an individual's property.

Changes in competence that represent actual intra-individual decrement must be differentiated from performance that has remained stable over time but that is now below the average performance of today's younger persons. The latter finding would not represent an older person's decline, but instead reflects the obsolescent functioning of older cohorts when compared to younger peers. Researchers and practitioners want to know at what age *developmental peaks in intelligence* occur in the level of performance and rate of age change, and why some individuals show *intellectual decrement in early adulthood* while others maintain or increase their level of functioning on some ability variables well into old age.

The intellectual processes required for the acquisition of cognitive structures and functions in childhood are not necessarily relevant to the maintenance of functions and the reorganization of structures that may be needed to meet the demands of later life. However, certain basic concepts relevant to the understanding of intelligence in childhood retain relevance throughout life, while the manner in which observable behaviors (*phenotypes*) express such constructs (*genotypes*) may change with age in pattern and organization.

### Intellectual Development in Old Age

Most data on *adult intellectual development* is based on work with the *Wechsler Adult Intelligence Scale* (WAIS; Matarazzo, 1982) or with Thurstone's *Primary Mental Abilities* test. Studies with the WAIS have focused upon a so-called classical pattern that shows a plateau reached in the 20s age cohort, with maintenance of performance on verbal subtests such as vocabulary and comprehension until the 60s, but early adult decline on performance tests such as block design or object assembly. More recent studies, however, suggest that in healthy individuals WAIS performance may hold up well into old age (Busse, 1993).

Age comparisons on the WAIS are compromised by the finding that the factorial structure of that battery changes from early adulthood to old age

(Cohen, 1959). By contrast, it has been established that the structure of the primary mental abilities remains rather stable across adulthood (Schaie, Maitland, Willis, & Intrieri, 1998). Data for the PMA indicate continued gains for most abilities until the persons reached ages of late 30s or early 40s. Thereafter a plateau is maintained until the early 60s, with the exception of the highly speeded measure of word fluency (vocabulary recall) that shows significant decline in the 50s. Gender differences have been reported that suggest earlier decline for spatial ability in men and word fluency in women. The average magnitude of *intellectual decline*, however, is quite small during the 60s and early 70s and is probably of little significance for the competent behavior of the young old. However, substantial average decline for most abilities are observed once the 80s are reached (Schaie, 1996, 2004).

### *Individual Differences in Adult Intellectual Development*

The data on average age changes tend to conceal a most important item. It might indicate to the casual observer that intellectual decrement in old age is universal and unavoidable. Data from the *Seattle Longitudinal Study* (Schaie, 2004) argues to the contrary. Only about one-third of individuals studied declined reliably over a 7-year period from age 60 to 67, and about 40% declined from age 67 to 74. Even by age 81, about 50% of the members of the longitudinal panels maintained their functional level over a 7-year period.

What accounts for these individual differences in intellectual change over time? In addition to factors that might be genetic in nature, other attributes characterize individuals who do not decline in old age; (1) they are free of cardiovascular and other chronic disease, (2) their *perceptual speed* has declined less than average, (3) they have at least average socioeconomic status, (4) they exhibit a stimulating and engaged life style, and (5) they describe themselves as having flexible attitudes and behaviors at mid-life (Schaie, 2004).

### Can Intellectual Decrement be Reversed?

In studies related to optimal or adaptive intellectual functioning, it has been recognized that older adults

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can be disadvantaged in at least 2 different ways. First, some age-related decline may occur through disuse, whether by personal choice or environmental restrictions. Second, some people may be disadvantaged because of rapid sociocultural and technological change. Cross-sectional *cognitive training* research has strongly suggested the modifiability of older adults' performance on a number of intelligence dimensions. However, the cross-sectional nature of this research made it impossible to examine one fundamental question: to what extent did training procedures result in remediation of age-related decline versus the acquisition of new performance levels in subjects experiencing no decline?

Within the context of a longitudinal study it has been found that reliably documented 14-year decrement could be reversed in approximately 40% of subjects undergoing a cognitive training program and significantly reduced in an additional 25% of participants (Schaie & Willis, 1986). Performance levels were enhanced also in substantial numbers of persons whose performance had remained stable. The effects of training were maintained over as long as 14 years (Schaie, 2004; Willis, 2001). The data suggests that for many older persons intellectual decline or cohort-related disadvantage (compared to younger peers) may be largely experiential in nature and can be modified by modest intervention efforts.

### *Intelligence in the Everyday World*

Attention has turned to the question of how traditional measures of intelligence relate to performance in real-life circumstances. Measures of so-called *practical intelligence* often appear to assess situation-specific competence rather than basic components of intelligence that would be widely generalizable. Hence, the application of intelligence to everyday situations will always require different combinations of more basic intellectual abilities. For an examination of practical intelligence from various points of view, see Schaie & Willis (1999).

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### References

- Busse, E. W. (1993). Duke longitudinal studies of aging. *Zeitschrift für Gerontologie*, 26, 123-128.
- Cohen, J. (1959). The factorial structure of the WAIS between early adulthood and old age. *Journal of Consulting Psychology*, 21, 283-290.
- Matarazzo, J. D. (1972). *Wechsler's measurement and appraisal of adult intelligence*. Baltimore: Williams and Wilkins.
- Schaie, K. W. (1996). *Intellectual development in adulthood: The Seattle Longitudinal Study*. New York: Cambridge University Press.
- Schaie, K. W. (2004). *Developmental influences on adult intelligence: The Seattle Longitudinal Study*. New York: Oxford University Press.
- Schaie, K. W., Maitland, S. B., Willis, S. L., & Intrieri, R. L. (1998). Longitudinal invariance of adult psychometric ability factor structures across seven years. *Psychology and Aging*, 13, 8-20.
- Schaie, K. W., & Willis, S. L. (1986). Can intellectual decline in the elderly be reversed? *Developmental Psychology*, 22, 223-232.
- Schaie, K. W., & Willis, S. L. (1999). Theories of everyday competence. In V. L. Bengtson & K. W. Schaie (Eds.), *Handbook of theories of aging*, (pp. 174-195). New York: Springer Publishing.
- Willis, S. L. (1996). Everyday cognitive competence in elderly persons: Conceptual issues and empirical finding. *Gerontologist*, 36, 595-601.
- Willis, S. L. (2001). Methodological issues in behavioral intervention research with the elderly. In J. E. Birren & K. W. Schaie (Eds.), *Handbook of the psychology of aging* (5th ed., pp. 78-108). San Diego, CA: Academic Press.

### INTERFERENCE

Interference is a general term for the disruptive effects of *irrelevant information*. This irrelevant information may come from *environmental distractors*, or it may be internally generated, such as currently irrelevant thoughts or memories or "strong but wrong" *habitual responses* that are inappropriate for the current situation. Interference is said to occur when such irrelevant information reduces the accuracy of or slows response. As a general rule, older adults are more susceptible to interference effects than young adults (Hasher & Zacks, 1988; Hasher, Zacks, & May, 1999; McDowd, Oseas-Kreger, & Filion, 1995).

*Older adults' vulnerability to interference* from environmental distraction can be seen on a variety of tasks including visual search, reading, problem-solving, and categorization. Age differences in distractor interference are especially large when there are many distractors, and when it is difficult to