1994a). When outbreaks of influenza A occur in nursing homes despite vaccination, prophylaxis with amantidine (or rimantidine) is a cost-effective strategy (Advisory Committee, 1994c; Patriarca, Arden, Koplan, & Goodman, 1987).

Because they can infect high-risk persons, health care personnel in a number of settings should also be immunized yearly. These include, but are not limited to, hospital and outpatient health care personnel, employees of long-term care facilities who come in contact with residents, and those who come in contact with high-risk individuals in the home, whether as household members or home care providers.

The effectiveness of pneumococcal vaccine has been controversial, and there are many contradictory studies in the literature. A recent meta-analysis (Hutchison, Oxman, Shannon, Lloyd, Altmayer, & Thomas, 1999) concluded that the vaccine reduced systemic infection significantly and found no evidence that effectiveness was lower in older people. Other studies (Sisk, Moskowitz, Whang, Lin, Fedson, McBean, et al., 1997; Nichol, Baken, Wuorenma, & Nelson, 1999) have concluded that pneumococcal vaccination is cost-effective and considerably underused in the older population. In contrast, a randomized trial in Sweden found no benefit in terms of preventing pneumonia in an elderly population (Ortqvist, Hedlund, Burman, Elbel, Hofer, Leinonen, et al., 1998). The general view is that the vaccine reduces the severity and health care costs associated with pneumococcal infection but may not have a perceptible effect on the incidence of pneumonia in the general community.

Currently, immunization with pneumococcal vaccination is recommended for all individuals 65 years of age and older and those placed at high risk because of chronic illness (Advisory Committee, 1994a). The current vaccine, which consists of antigens from 23 serotypes, has been available since 1983; the first vaccine, which was introduced in 1977, had only 14 serotypes (ACP, 1994). Because antibody levels decline more quickly in the elderly than in younger patients and may be undetectable after 6 years (ACP, 1994), the ACP Task Force on Adult Immunization recommends that older adults with high-risk conditions (such as functional asplenia) be revaccinated after 6 years (ACP, 1994). They do not recommend revaccination for healthy elderly.

Tetanus

Currently, revaccination with a combined tetanus diphtheria (Td) booster is recommended every 10 years after the initial immunization series (ACIP, 1994a). The ACP Task Force on Adult Immunization (1994) recommends an alterative strategy, that of a single booster at age 50 for those who completed the primary series of three in childhood followed by boosters in their teens and early 20s. A cost-effectiveness analysis examining a single immunization at age 65 for those who had previously received the primary immunization before age 6 (Balestra & Littenberg, 1993) lends support to the utilization of this simpler, single booster strategy. None of the proposed strategies changes the recommendations regarding wound prophylaxis.

Other Immunizations

The recommendations regarding immunization of older adults are based on the research and experience in the United States. Other countries have developed policies based on their own experience.

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See also
Immune System

IMPLICIT MEMORY AND LEARNING

Implicit memory occurs when performance reveals the effects of prior experiences (usually individual items or events), even in the absence of conscious recollection of those experiences. *Implicit learning* refers to acquiring information about the structural properties of relations among objects or events in the absence of either the intent to learn or the awareness of what has been learned. Implicit forms of learning and memory differ from their explicit counterparts in that they obey different principles of operation, rely on distinct brain areas, are differentially sensitive to brain injury, and serve different functions (for reviews, see Stadler & Frensch, 1997). For example, although being distracted during an initial encounter with an event usually hurts explicit memory for that event, it often does not hurt implicit memory. And although patients suffering from amnesia have profound impairments of explicit memory and learning, their performance on implicit tests is often indistinguishable from that of normal controls. Because implicit memory and learning differ from each other in important ways, implicit memory is considered first, followed by implicit learning.

Explicit tests of memory require *conscious recollection*. *Explicit memory* is called on when people attempt to recall an event from their childhood, to recall which words occurred on a list encountered in the laboratory, or to decide whether or not a particular stimulus, such as a word or face, occurred in a list they encountered earlier. In all these cases, memory requires that the person be aware that some event occurred in the past. In contrast, implicit tests do not require such conscious recollection, such awareness of remembering. For example, implicit memory for a word is demonstrated if that word is read more rapidly on its second presentation than its first, even in the absence of explicit memory for the earlier encounter; such facilitation is called *priming*.

Dissociations between implicit and explicit memory occur in the course of normal aging (for reviews, see Fleischman & Gabrieli, 1998; LaVoie & Light, 1994). Although substantial age-related deficits occur on almost all explicit tests of memory, age differences are usually smaller or absent on implicit tests. Whether the small age-related deficits seen on implicit tests are due to true age-related changes in implicit memory processes occurring for most individuals, to a decline in a small proportion of older people who are in the early stages of as yet undiagnosed dementia, or to the undetected influence of conscious recollection is as yet unknown. One observation favoring the latter interpretation is that the small number of studies using the process-dissociation procedure have consistently yielded age differences on the estimates of recollection but not on the automatic components of memory (e.g., Hay & Jacoby, 1999). However, these data too must be interpreted with caution, because this procedure also requires assumptions that are subject to debate.

The reliability of the finding of no or minimal age difference in implicit memory is as yet unclear. There are many different implicit tests, and although there is as yet no agreed on taxonomy nor an adequate theoretical account, it is clear that these different implicit memory tasks do not all tap the same underlying cognitive processes. Some implicit tests of memory require that new associations be formed, whereas others do not. Some implicit tests seem to reflect the continuing activation of perceptual processes, whereas others appear to be more conceptually based, reflecting the activation of a conceptually or semantically organized memory. So far, there is no consistent evidence that any of these categories of implicit memory is more likely than others to be impaired by normal aging (e.g., Fleischman & Gabrieli, 1998; LaVoie & Light, 1994).

Implicit forms of learning are at least as diverse as their implicit memory counterparts. Implicit learning, which is often called *procedural learning*, includes classical conditioning, skill learning (of both cognitive and motor skills), learning of stimulus covariations, sequence learning, learning of artificial grammars, and learning in control of complex systems. Here too, as in the case of memory, it is difficult to separate implicit from explicit learning, because both often occur simultaneously. To make generalizations yet more difficult, the aging of implicit learning has been studied even less than that of implicit memory. So far, all of the types of implicit learning that have been studied have revealed age-related deficits, at least under certain conditions. For example, classical conditioning is reduced in older people compared to younger ones (e.g., Woodruff-Pak & Jaeger, 1998), and implicit learning of sequential patterns shows age-related deficits at least when the patterns are complex and subtle (e.g., Howard & Howard, 1997). But even though implicit forms of learning are not completely spared the ravages of age, they do seem to be less severely impaired than most forms of explicit learning.

The demonstration of the relative age-constancy of implicit memory and learning has presented new challenges for theories of cognitive aging and has encouraged researchers to compare the patterns of savings and loss seen in amnesia, normal aging, and dementia, such as Alzheimer's disease. The relative age-constancy of implicit memory and learning also is important for everyday life, because implicit processes exert subtle, usually unnoticed, influences on common activities. For example, implicit memory affects the likelihood that particular ideas will come to mind. It also affects the meaning people assign to stimuli they encounter. Implicit learning and memory influence the ease and accuracy with which people perceive external stimuli, and they influence the preferences, impressions, and stereotypes they form. Implicit learning is involved in adapting to new environments, in learning the syntax of unfamiliar languages, and in learning to use new technologies, such as computers. In addition, the fact that implicit memory and learning are relatively age-constant suggests that they take on an even more central role, compared to explicit forms, as people get older. This relative age-constancy also implies that the effectiveness of cognitive interventions might be improved if memory remediation programs for normal elderly and for amnesia and dementia patients attempted to build on implicit memory and if rehabilitation programs for stroke victims took advantage of relatively preserved implicit learning abilities.

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See also
Memory and Memory Theory

INCARCERATION

See
Crime (Against and By the Elderly)

INCONTINENCE

See
Fecal and Urinary Incontinence

INDIVIDUAL DIFFERENCES

The term *individual differences* has served social, behavioral, and biological science for decades. It identifies differences among individuals—variation—in each given attribute or characteristic. Individual differences can refer to biological, behavioral, or social-contextual attributes. The attributes can be either qualitative or quantitative in character; as simple as single observables or as complex as patterns of age-related changes defined on multiple variables; as concrete as physical height or as abstract as spatial intelligence. Individual differences of this kind are sometimes referred to specifically as *interindividual differences*. In contrast, the term *intraindividual differences* identifies variation or differences manifested over different attributes within the same individual unit, and the term *intraindividual change* signifies variation or change over the same attribute within the same individual unit (Buss, 1979). The present discussion will attend only to interindividual differences.

Beginning in a major way with the investigations of Francis Galton, although the roots can be traced much farther back in history (Boring, 1950), many of the specialty areas of behavioral and social science have leaned heavily on the examination of individual differences. Included are human abilities, personality, developmental, and social psychology, status attainment deviance, social mobility, fertility, and behavior genetics, to name but a few. Work on individual differences has contributed substantially to the current status of empirical science and helped bring to the fore the names of Binet, Burt, Cattell, Spearman, Thorndike, Thurstone, and many others.

An Approach to the Study of Phenomena

Individual differences characterize a paradigmatic approach to the description, explanation, and prediction of behavior, broadly defined (Anastasi, 1958). Cronbach (1957) identified differential psychology—the study of behavior by focusing on individual differences—as one of two disciplines of scientific psychology. For the differential psychologist, the variation that can be measured among units is the source of data to be studied and analyzed. For example, relationships among the variations in different attributes (covariation) can be used to predict the individual's status on one attribute from his/her status on another attribute. Systematic analysis of covariation patterns can illustrate explana-