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ISSUES OF AGING

PSYCHOLOGICAL CHANGES FROM MIDLIFE TO EARLY OLD AGE: Implications for the Maintenance of Mental Health

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Changes from midlife to old age are described and conceptual models of adult development are discussed to debunk some commonly held stereotypes. Effects of biological change on behavior; age differences in learning, memory, and motivation; and age changes in intelligence and personality are considered, including implications for primary prevention, diagnosis, and social intervention.

Researchers and practitioners who were the pioneers in the mental health fields at first focused primarily upon the early developmental stages, only slowly shifting their interest from childhood to adolescence and the early adult parenting years, but largely ignoring what came beyond. Such early focus was not unjustified. In 1900, only 28% of the American population exceeded the age of 35, and an almost trivial three percent had reached or exceeded the magical age of 65, popularly thought of in our culture as the onset of old age.[36] By contrast, in 1981, 45% exceed age 35, and 11% of the population are 65 or older. During the same period of time, life expectancy in America has increased from an average of 51.1 years to 76.4 years for women, and from an average of 48.2 years to 68.7 years for men. A little publicized fact is that the U.S. census in 1970 identified more than 106,000 Americans 100 years of age or older.

In the past, surviving into old age was a relatively rare phenomenon and one often restricted to the most hardy and environmentally favored, those least likely to encounter mental health problems. In addition, major theoretical positions have treated development as concluding in young adulthood. Beyond that point, one might, of course, encounter regression, organic pathology, and other personal catastrophies. But intervention in such instances seemed difficult and, with limited life expectancy, often not worth the professional's effort. Moreover, in the past, the mental health professional's stereotype of the "old crock" who could not be treated successfully, was matched by the elderly client's apprehension that utilization of mental health services implied an admission of low personal worth or outright "insanity." While such stereotypes may have interfered in the provision of services for the elderly in the public sector, apprehension concerning their insufficient resources may often inappropriately deter referral within the context of private practice.

Although the great majority of today's elderly are not poor (only 14% of those over 65 are under the poverty line) and 95% of those over 65 remain community residents, there are detectable changes that begin to impose constraints upon the behavior of most of us as we get older. During the past two decades there has been a knowledge explosion in the field of adult age changes.[6, 10, 11, 15, 26] Much of this material suggests that old age is likely to be experienced by most individuals in developed societies, that old age for most need not be and is not a disastrous experience, but also that our knowledge based on the behavior of young adults cannot be generalized to the elderly with impunity because of a wealth of both normative and non-normative age changes and because of generational differences. All of these developments suggest that the periods of adulthood and old age must become of increasing concern to the mental health professional. The extension of the normative life span into a long period of postparental and postvocational behavior is creating new life crises and increasing the frequency of psychopathology which cannot readily be identified or dismissed as consequences of early development. More information on the psychological changes that occur from mid-life into old age is therefore essential to understand the needs and opportunties for primary and secondary prevention as well as remediation.

Normal and Abnormal Aging

Any balanced presentation of adult age changes must distinguish among the occurrence of events that are implicit in the biological characteristics of humans as a species, those that are programmed to occur at given life stages by a particular culture, and those personal accidents or pathologies that may appear to be signs of premature aging, but whose permanence or reversibility may have little to do with chronological age. The first two sets of events are generally considered to be normative, although the second is likely to be influenced by historical variation. (For example, life stage expectations may be influenced by increased longevity, changes in social structure, or socialization practices.) The third set would be identified as non-normative (albeit not unique), with frequency of occurrence influenced by environmental factors as well as changes in our knowledge base with respect to the prevention or treatment of the consequences of accidents, illness, and the modification of unfavorable environments.[5]

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Scope of this Presentation

It is the purpose of this synthesis paper to convey a sense of the transitions that occur from mid-life into early old age. Emphasis will be given to normative nonpathological changes, an understanding of which may help facilitate the maintenance of mental health and prevention of late life problems. As part of this enterprise, a number of stereotypes need to be debunked. To do so some attention will first be paid to the way in which conceptual models of adult development must differ from those used to describe early growth and development. Next, some of the normative biological changes that directly affect behavior, changes in the sense organs and of the general state of health, will be considered. Attention will then be paid to age differences in learning, memory, and motivation and age changes in intelligence and personality. Finally, some implications will be drawn with respect to primary prevention, diagnosis, and psychosocial intervention.

MODELS OF ADULT DEVELOPMENT

Mental health professionals and researchers interested in the course of adult development must understand that while further growth will occur beyond mid-life, such growth does not necessarily imply continued behavioral differentiation. The latter concept implies that, as each new developmental plateau is attained, further development occurs through the evolvement of more complex structures. In adulthood, this kind of differentiation is not likely to occur.[27] Instead, transformations will be of a more qualitative nature, and as old age is reached a return may occur to greater structural simplicity, if only to counteract experiential overload.[56]

Because of the multiplicity of situations that elicit meaningful adult behavior,[66] it is a *sine qua non* of adult development models that behavioral variability will increase over the life span.[2] Throughout childhood one is struck by the prevalence of modal patterns with limited variations during the period of behavior acquisition. By contrast, there is great variety in the expression of inter- and intraindividual differences in adulthood. Four topics need be addressed in relation to the specifications of models of adult development: First, development and aging must be differentiated; second, ontogenetic development (age changes) must be distinguished from differential sociocultural attributes characteristic of successive birth cohorts (age differences); third, three basic models that alternatively assume stability, irreversible decrement, or decrement with compensation will be described; and, fourth, attention will be called to the extent of behavioral plasticity (intraindividual variability), which becomes most noteworthy with increasing age.

The Difference Between Development and Aging

It is quite possible to use the terms *aging* and *development* interchangeably as indicators for a developmental process which, throughout life, may take a variety of directions, intensity, and range of occurrence.[4] For the mental health professional, who is oriented toward an appreciation of early development, it may be useful, however, to explore the subtle ways in which one's

interests shift as the inquirers' concern moves from the study of emergent behavior to that ubiquitous plateau of apparent adult behavior stability, and beyond to eventual decline and deficit.

The expression of early development is characterized by the remarkable degree of isomorphism between the physiological structures that appear to be essential to the development of a given behavior and the actual observation of that behavior's emergence.[28] Practically every noteworthy behavior change identified to occur between birth and maturity can readily be observed in practically every surviving individual, the variability in such adaptive behavior is small, and the time interval between the occurrence of the behavior in the least and most advanced is brief. But as adulthood is reached, the isomorphic relation between structure and function breaks for the most part.[61] In the cognitive realm, for example, attainment of the Piagetian stage of formal operation does not depend upon the appearance of specific structural properties of the organism[49] and, at the other end, performance decrements in the elderly are only infrequently tied to specific physiological deficits.[9] Another important distinction involves the shift of goal objectives for individuals from the acquisition of skills during childhood to the application of acquired skills and then to responsible societal roles and tasks in adulthood.[17, 35] The transformation of behavior in terms of the goals of the individual's social setting may again be modified in favor of maintenance of adaptive behavior, within a physiologically less stable structure, as governed by increasingly egocentric goals during old age.

Whether during development or aging, however, it is certain that some basic concepts found to be of relevance in the understanding of children will remain of importance; self-care, social interaction, problem solving, and language functions will obviously remain important throughout life. Nevertheless, the manner in which observable behavior (phenotypes) serves to express these constructs (genotypes) is likely to change, as is their pattern of organization.

Age Changes, Age Differences and Sociocultural Change

Models of adult development are closely related to assumptions about the nature of aging as well as to the data bases used to generate empirical findings. It is not possible here to review the complex issues involved in the interpretation of data obtained from cross-sectional, longitudinal, or sequential data collection strategies. However, it is important to mention briefly the assumptions implicit in these different sources of information (for greater detail, see Nesselroade and Baltes;[44] Schaie;[54, 55] and Wohlwill[70]).

Most reported data on human aging involve *age differences,* that is cross-sectional studies in which, at one point in time, persons are compared who belong to two or more different age groups. Of far greater interest for our purposes are *age changes* observed in longitudinal studies where the same individuals are compared over two or more points in time, as they get older. Note that the first method must confound ontogenetic change with generational differences; obviously, no two age groups can belong to the same birth cohort in a cross-sectional study! The second method, on the other hand, must confound on-

togenetic change with the impact of sociocultural events occurring between measurement points. Most behavior of interest to mental health professionals is likely to involve generational differences and sociocultural change, and results from cross-sectional studies cannot therefore be treated interchangably with those from longitudinal inquiries. In fact, most age differences reported in the aging literature can probably be more parsimoniously interpreted to be generational differences. As a consequence, sequential strategies have been advocated which involve the replication of traditional data collections by means of longitudinal or cross-sectional sequences.[1] The former are of interest when effects of age are to be separated from those of generational differences, the latter are appropriate when age and secular trends are to be separated. Specific strategies, called the cohort-sequential, cross-sequential, and time-sequential methods, have further been advocated.[55] Choice of these strategies and inferences drawn therefrom must, of course, depend on certain *a priori* assumptions. Inferences with respect to age changes therefore assume that secular trends are trivial when using the longitudinal or cohort-sequential methods; generational trends are assumed to be unimportant if cross-sectional or time-sequential data analysis strategies are utilized; and trivial age effects are assumed where the cross-sequential method is advocated.

Three Basic Models for Adult Development

Although during childhood it is possible to view development as a unidirectional phenomenon leading from simple to more complex behavior, no such assumption is warranted beyond adolescence. In previous discussions of this matter, therefore, attention has been called to at least three alternate models for the further life course.[54]

Of these, the first states that behavior will remain stable once the most adaptive maturational level is reached in young adulthood. The *adult stability* model may be particularly appropriate for those types of behavior whose biological constraints remain relatively stable from maturity until death. The model is of interest to clinicians in the assessment of cognitive behavior of the crystallized variety; if all environmentally available information has been mastered and none is lost, behavior should remain stable.[16] The model is also appropriate for many personality traits and attitudes that are formed early in life and continue to remain stable.[62] For those variables, where the stability model holds, interest is no longer centered in age-related behavior change, but rather in the secular trends and generational differences that may affect adaptive behavior and, of course, such matters as test norms or client expectations.

The model that implicitly underlies most traditional discussions of behavioral development past the prime of life has been called *irreversible decrement*. Where true, the model is attractive, because it would indeed permit prediction of behavior change from chronological age; respectively, it would permit classifying individuals as behaving like persons who are older or younger than they are. The unfortunate aspect of this model is the attention that is focused on those characteristics that are strongly affected by pheripheral sensory functions and reaction speed, which

might well be compensated for otherwise by the provision of prosthetic strategies and environments. Although age functions for variables fitting the irreversible decrement model ought to be universally relevant, it still behooves the clinician to note that both level and rate of decline may and will shift across generations and subcultures.

Perhaps most relevant to the interests of mental health professionals is the third, the *decrement with compensation* model. This model may fit variables such as fluid intelligence, temperament, and other personality traits. These are variables relatively insensitive to generational differences, but that will show the effect of changes in social support systems, stereotypes, and educational practices. Variables fitting this model might also show the terminal drop phenomena often seen in effective behavior in close proximity to death.[67] What is happening here, obviously, is that the compensatory processes fail to suffice beyond some critical threshold. Alternate evidence for the credibility of this model would be provided by variables showing a slow but progressively accelerating decrement pattern marked by temporary reversals (*e.g.*, improvement of hearing upon fitting of an aid).

The Greater Plasticity of Adult Behavior

Suggesting the prevalence of different developmental progressions in adulthood for the physiological and behavioral domains next requires calling attention to the progressively increased range of individual differences in the maintenance of adaptive functions and in the ability to modify undesirable behavior and relearn lost skills.[3,4] The extent of this variability is not always obvious because the clinician is likely to encounter most often older individuals with physiological pathology that also tends to constrict their behavior. It is important therefore to know that the *range* of observed behavior increases markedly, to the extent that many elderly adults will still perform well above the average of young adults.[57] The increasing number of individual instances of lack of substantial decline with age suggests that intervention to restore presumed deficits may be quite feasible.[37,50] Finally, it should be noted that individual differences are maximized by differential life style which may markedly affect the maintenance or decline of complex behavior.[30]

BIOLOGICAL CHANGES AFFECTING BEHAVIOR

Although it is not the purpose of this paper to review biological age changes *per se*, it is necessary to call attention to those normative age changes that directly affect behavior and may have to be taken into account by the clinician who wishes to help the aging individual understand and compensate for the behavioral constraints imposed by changing biological capabilities. Of primary interest to the mental health professional here are changes in sensory and perceptual capabilities, and some general health factors (including changes in energy level, the increasing importance of adequate cardiovascular functioning, and the role of the autonomic nervous system). The variables covered here are of necessity selective rather than exhaustive.

Changes in Sensory and Perceptual Capability

Visual acuity. Beginning in the fourth decade of life, structural changes occur

in the eye that lead to a lessening of light transmission and accommodation power. The cortex region of the crystalline lens thickens progressively, reducing its transparency. In addition, yellowing of the lens reduces the amount of light reaching the retina and decreases sensitivity to the shorter wave lengths of the visible spectrum. Older persons have difficulty, therefore, in discriminating between blue, blue-green and violet. Reduced accommodative power affects accuracy of distance vision, sensitivity to glare, binocular depth perception, and color sensitivity. In the sixth decade, moreover, circulatory and metabolic changes lead to a reduction of the size of the visual field, decreased sensitivity to flicker and to low quantity of light. Particularly critical, however, for determining the visual acuity is the brightness of the image reaching the retina (for further details, see the review by Fozard *et al*[29]).

Perceptual changes with age lead to an increasing tendency to retain the initial perception of a stimulus, with consequent difficulty or inability to reorganize that perception. It is not yet clear, however, whether this phenomenon should be attributed to the decline in visual acuity or to a personality trait of cognitive rigidity.[19]

In an interesting study, Pastalan, Mautz and Merrill[47] have tried to simulate the effects of lens yellowing, opacity, and light scatter in order to examine the environmental experiences of aging persons with "normal" sensory losses. They found that age-related decrements in visual ability do have a limiting effect upon the older adult's ability to use buildings, facilities, and other spatial environments.

Many of the above deficits can be compensated for, however, by providing appropriate corrective lenses, by environmental changes involving increasing contrasts between visual objects and their surrounding fields, and by increasing the level of overall illumination.

Auditory acuity. Some degree of hearing loss has been reported as early as age 32 for men and age 37 for women.[38] Such changes occur as a function of presbycusis, the physiological degeneration in the auditory system involving a sensorineural bilateral loss of auditory acuity for the high frequency tones. Presbycusis results in decrements in thresholds for pure tones, speech, and pitch discrimination, deficits likely to interfere with the older person's ability to communicate. The high frequency loss introduces difficulty in discriminating phonetically similar words, particularly those containing the letters *s, t, q, f* and *g*. And increased noise level can enhance the sound discrimination problem.[20]

By the time the seventies are reached, some hearing loss is virtually universal, but sex differences exist, such that men have greater loss at higher frequencies than do women and vice versa. Because of the importance of high frequency sounds in speech discrimination it is not surprising that men show a correlation between hearing impairment and level of intellectual functioning.[59]

Again, it is possible to compensate for hearing losses occurring with normal aging by fitting appropriate aids and by attending to the acoustic properties of the public and private areas frequented by older individuals. The mental health practitioner must be particularly alert to the possibility that adaptation failures and suspected paranoid ideations may often be a function of inadequately compensated but quite compensable auditory loss.

Perceptual speed. Age-related slowing in behavior has been attributed in the past to slower mediation processes in the central nervous system.[8] However, recent studies of the phenomenon of perceptual masking seem to implicate more strongly changes in the peripheral perceptual system. *Perceptual masking* is the failure to perceive a visual or auditory stimulus if the sound or display is followed too quickly by a second competing stimulus. Adults over 60 have been found to require substantially greater intervals between two successive stimuli to be able to discriminate them.[69] Research also points to longer scanning time required with increasing age, particularly when complex information is to be digested.

It appears certain that slower exposure of materials, redundancy of presentation, and decrease of information complexity would be of substantial help to the aging adult. It is not that the world is becoming too complex for the older person to manage; what increases in difficulty is the manner in which that person is expected to digest what must be known to cope successfully.

General Health Factors

Energy level. Without doubt one of the first signs of physiological aging which affects a variety of behavior is the subjective and objective experience of lowered energy level. Much of this drop may be merely the consequence of adopting more sedentary and less active life styles and may well be reversible by suitable programs of fitness maintenance.[32] Nevertheless, it is likely that perceived low energy will affect such diverse behavior as the initiation of sexual activity, participation in intellectually stimulating and physically invigorating activities, or the development and replacement of friendships or interest patterns. The apparent listlessness of many older people should first be investigated with respect to common minor physiological problems or for the possibility of counseling life style changes before a hypothesis of a beginning depression is investigated further. While there are clearly objective bodily changes that contribute to the lowered energy level[52] attention must also be called to generational differences in life style, which contribute largely to the problems of today's elderly, but are likely to reduce in importance in future generations.

The role of cardiovascular disease. There is a close interaction of the cardiac system and the brain in controlling voluntary behavior. Even small changes in efficient blood-flow and cardiac output may therefore affect behavioral competence. For example, it is known that heart rate is lowered as part of attending to and perceiving a visual display or auditory signal. Less than perfect synchrony between the cardiac cycle and CNS processing will therefore be expressed in lowering of optimal function. It is not unusual therefore to hear older clients report that they did not hear a statement in a lecture which the lecturer certainly included. Formal evidence is amassing that at least some of the cognitive deficit thought to be inevitable in old age might be directly linkable to specific cardiovascular problems.[33] Consequently, both lifestyle intervention which prevents cardiovascular disease, as well as prompt treatment of early symptoms of such

disorders are likely to improve maintenance of behavioral functions as well.

Arousal level. Destabilization to some extent also occurs to the autonomic nervous system. Although there are conflicting opinions as to whether the aging ANS becomes over- or underaroused,[42] there is evidence that arousal level becomes increasingly critical for successful performance in problem solving situations[23] and that susceptibility to stress consequently increases with age.[24] These findings do not suggest that life stresses should or can be avoided with increasing age; they do, however, suggest that routine interventions to gain better control, whether by means of biofeedback or chemotherapeutic intervention, become of interest. Much caution is in order for the latter techniques, however, as it is well known that the increase in prescribed and nonprescribed drug use with increasing age and the resulting adverse drug interactions (sometimes referred to as the "disease of polypharmacy") in itself may be one of the major causes of behavioral destabilization in the elderly.[68]

AGE DIFFERENCES IN LEARNING AND MEMORY

This section is entitled *age differences* in order to focus upon the fact that, except for incidental data coming from longitudinal studies of intelligence, most of our information on learning and memory is based on cross-sectional evidence; caution is therefore in order, before we conclude that the lower performance of older comparison groups reflects lowered performance with age rather than sociocultural obsolescence. Furthermore, only limited evidence is available on learning and memory of meaningful and everyday information.[65] The following section will consider some of the more important information on apparent age differences in how information is acquired and retrieved and on complex problem solving.

Information Acquisition

Perceived information is entered into short-term memory where it is held temporarily before being encoded for storage. Given ample opportunity for stimulus recognition, older individuals do not seem to be at a disadvantage with respect to short-term memory, but substantial age differences have been found at the deeper level of processing required for retention in long-term memory.[21] It is here that the older learner seems at a disadvantage because less efficient encoding strategies are used. The disadvantage is greater when unfamiliar materials are learned than for the memorization of well known facts. Often self-pacing and the use of idiosyncratic mnemonics may be more helpful than the "expert's" instruction on how the older learner should proceed. Age differences have been found to be related to meaningfulness of material, with older learners well able to handle materials perceived to be meaningful.

Information Retrieval

While there is no evidence that the older person "loses" information, provided it was learned and stored in the first place, it seems certain that there are increasing problems with efficient retrieval. For example, age-related deficit has been observed when attention must be divided between registering stimuli and retrieving them from memory, with the older person attending to one aspect while neglecting the other. Performance

decrements are particularly apparent when the older person must reorganize information. It has long been known that older persons have greater difficulty in recalling information from storage than in recognizing and identifying the correct information from cues presented to them. It has also been found that information is retrieved more easily if it was encoded in more than one sensory modality. In other words, when information has been both heard *and* seen it is more likely to be remembered.

Many of the items to be remembered in the everyday experience of older persons are so overlearned, that a pronounced deficit here must be viewed as evidence of depression or organic pathology. But much can be done to teach the aging person to retain efficient strategies for information acquisition and recall, as well as providing reassurance that the often-reported minor memory lapses are characteristic of human behavior at all ages.

Problem solving. There is no question then that old dogs *can* learn new tricks. Indeed, living organisms remain learning organisms as a prerequisite for remaining alive! Nevertheless, there are some qualitative and quantitative changes that occur toward the beginning of the seventh decade of life. Slowing sensory and perceptual processes require that more time be taken to solve problems in order to achieve equal levels of accuracy. The older problem solver is somewhat disadvantaged because of learned strategies that are obsolescent in today's complex society (see section on intelligence). To compensate, there is a tendency to simplify conceptual frameworks even when this may be maladaptive. And older persons often tend to become increasingly egocentric in their problem-solving activities. Nevertheless, what is most impressive is not that old people asked to perform by criteria set for their juniors do perform somewhat less well, but that, for most, the ability to solve problems and make independent decisions remains intact well into old age.[58]

AGE CHANGES IN INTELLIGENCE

It has been the traditional view that intelligence, that global attribute describing complex adaptive behavior, reaches a peak in young adulthood and rapidly declines soon thereafter, even though in a paradoxical manner it has also been thought that wisdom can be achieved only by attaining a ripe old age! Before taking issue with this stance we must first distinguish between intellectual ability and behavioral competence. When we speak of intelligence we refer to the complex system of cognitive traits which are basic to adaptive behavior. Intelligence tests tell us how this system of cognitive traits is organized within the individual. Competence, on the other hand, refers to the manner in which intelligence relates to the problems of daily living. An intelligent person has *acquired* the basic skills required for many types of adaptive behavior; a competent person can *apply* a specific combination of such skills to a specific life situation.[18] This section will address three questions: *1*) Is there evidence for decline of intellectual functions in adulthood; *2*) is such decline, if present, uniform for different abilities; and *3*) what is the practical extent and consequence of age-related changes?

Adult Age Changes: Decline or Obsolescence?

Much of the literature on intellectual change in adulthood in the past has been based on cross-sectional data that have exaggerated generational differences such as educational levels, nutritional histories, and the like. A summary view of the more recent research results gathered over the past two decades by means of longitudinal studies, however, permits a number of well-supported conclusions. First of all, it seems safe to state that intellectual decrement occurring before the late fifties must be considered to be pathological rather than normal. From the early sixties to the mid-seventies there is normative decline on some but not all abilities, with wide interindividual differences. Beyond 80, however, decrement is the rule for most. It should also be noted, however, that for abilities requiring speed of response, some decline may be noted beginning in the fifties. This is also true for abilities sensitive to modest impairment of the peripheral nervous system. And individual life styles or cardiovascular disease may exacerbate the otherwise moderate normative changes.

These normative events, however, must be clearly distinguished from the fact that most persons now in their fifties and older, because of the enormous pace of sociocultural change, are suffering to some extent from obsolescence effects. That is, they compare poorly with their younger peers, even though, as is true for most, they function intellectually as well as they ever have. The mental health professional, therefore, has a major stake in distinguishing between individual pathological decline and personal disadvantage due to sociocultural obsolescence. The former requires psychotherapeutic and medical intervention, while the latter calls for remedial education (for further elaboration, see Schaie[57, 58] or Schaie and Willis[64]).

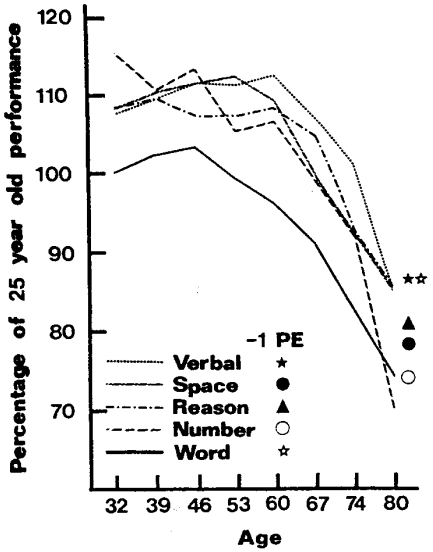
Differential Decline

Not all abilities change at the same rate or show similar cohort patterns. For example, traditional cross-sectional studies, such as the normative data offered for the Wechsler Adult Intelligence Scale, provide what has been called the "classic aging pattern."[13] This pattern involves the maintenance of performance on verbal scales till late in life, but shows early drop for nonverbal or performance tasks. Cattell[16] and Horn[34] have proposed that there are two kinds of abilities, which they call "crystallized" and "fluid" intelligence. The former depends upon the acquisition of information and skills transmitted by the culture, the latter is more dependent upon the physiological characteristics of the organism. Horn and Cattell argue that there is little reason why there should be decrement in crystallized intelligence but every reason why such decrement should appear for the abilities which involve fluid intelligence.

The above arguments are complicated by the facts of differential cohort flow. That is, persons who went through the educational system prior to World War II are likely to have had training which gave emphasis to the memorization of facts, while younger cohorts received educational exposures emphasizing the recognition of relationships. It is therefore not surprising that the differential

Figure 1

CHANGES IN PERFORMANCE LEVEL WITH AGE ON THE PRIMARY MENTAL ABILITIES EXPRESSED AS PROPORTION OF PERFORMANCE AT AGE 25



Data from the Seattle Longitudinal Study.[57, 58]

declines noted in cross-sectional studies should be cohort-specific. In our studies with the Primary Mental Abilities based on longitudinal data, we do find that cohort effects are greater for those of our measures which have "fluid" components: spatial visualization and inductive reasoning. Within a particular cohort, drop occurs first for a measure that is highly speeded, Word Fluency; then indeed there is drop for Inductive Reasoning and Space, but at the oldest age, it is the crystallized variable Number which shows the greatest drop (see FIGURE 1).

It is clear, then, that changes in intellectual functioning occur in a complex ability pattern and measurement of global IQ will not be very instructive. On the other hand, carefully relating specific patterns of cognitive behavior to clearly defined competence-demanding situations is likely to increase in importance.

Practical Consequences of Age-Related Change in Intelligence

Much of the literature on age changes and age differences tells us that there are statistically reliable age changes and differences as we move from mid-life into old age. It often does not answer directly the question of what the practical consequences might be. In other words, are these changes large enough to matter? One way in which this question can be addressed is to consider longitudinal study findings in terms of the magnitude of loss as a proportion of performance at a younger age. Another is to find the value equivalent to the lower bound of the middle 50% of performance at such earlier age (one PE below the mean). Such analysis for our data suggests that, by age 67, this lower bound had not been reached for any but highly speeded measures; by age 81, however it is reached or passed for most measures. By age 67, drop of performance is as much as 27% for Word Fluency, but on Verbal Meaning (recognition vocabulary) performance was actually 17% higher than at age 25! (See FIGURE 1 and Schaie.[58])

These findings suggest that the major change from mid-life to early old age as far as intellectual competence is concerned involves the increased reaction time required in certain tasks to reach quantitatively high response. Rapid intraindividual change on cognitive functions observed by the clinician

should therefore always be suspected as evidence of possible pathology, and the well-functioning person can and should be reassured that aging is *not* synonymous with intellectual incompetence. It is only as the eighties are reached that age-related decrement becomes evident in many persons, and even then to a lesser extent than previous literature has led us to believe.

PERSONALITY AND MOTIVATION

It is often argued that it is the differentiated adult personality and the incentives that will initiate adult behavior which may be most important in understanding changes during the adult life course. Nevertheless, those studies that have tried to investigate systematic changes across adulthood have brought little information on systematic change. This is not to say that personality is indeed firmly fixed in early childhood as proposed by the orthodox psychoanalytic model. Rather, the remarkable changes observable in many individuals seem to be a function of individual non-normative experience. What is important, however, is to identify those few traits that do seem to shift systematically, as well as the striking generational differences between old and young which may contribute to the difficulties of today's elderly. In the area of motivation, we must note apparent age changes in cautiousness, the increase in social conformity, differences in perceived competence, and the increasing importance of egocentric meaning.

Age Changes in Personality Traits

Popular treatments of mid-life changes, such as Gail Sheehy's *Passages* or Daniel Levinson's[39] more scholarly treatment, tend to create the impression that there are regular transformations occurring for all of us. Their evidence is based on rather limited data and what there is would rather support the proposition that most of us face common culturally programmed demands that are responded to in unique ways, often depending upon our early experiences. Certain dynamic models of adult personality[25, 35] imply that adult personality differentiation occurs by successive moves to more advanced stages. But none of these models require that the transformations occur according to an ontogenetically determined timetable. If there is a timetable, it may more likely be programmed by social expectations. Take the case of the once popular disengagement theory of aging.[22] Here was the notion that adjustment to aging required progressive withdrawal from societal interaction. What has become clear, however, with changing expectations, is that most old people do not wish to disengage but are frequently forced to do so.

For the purpose of determining what changes with age and what differentiates the generations because of sociocultural change, it may be useful to distinguish three types of personality traits.[62] First, there are certain *biostable* traits, which are genetically determined or shaped by early environmental influence, perhaps during a critical imprinting period. Such traits typically show marked sex differences but also remain stable across the life span. They may, however, show marked generational differences, because of the permanence of early socialization effects. In our studies, examples are the dimension of toughtendermindedness, threat reactivity,

but also value sets such as expressed honesty and community involvement.

A second set of *acculturated* traits, conversely, seems to be affected by environmental events occurring at different stages in the individual's life and is further subject to rapid modification by sociocultural change. Such traits show no systematic sex differences, but they do occasionally have age patterns that appear to follow culturally imposed prescription. They may also be stable across the life span, but show well defined generational differences. Among the former we found an age-related decline in self-sentiment but increase in humanitarian concern, among the latter positive cohort differences for self-sentiment and superego strength. Non-age-related traits of this type included dominance, flexibility, social responsibility, and willingness to offer financial support for society.

Finally, there are certain *biocultural* traits that involve genetic bases but are also subject to modification in their expression because of universal life-stage expectancies. Here we might name excitability (which increases with age, and more so for women than men) and need for heterosexual expression (which seems to go down, but less so for men than for women).

When all is said and done, however, it is clear that personality styles occurring in mid-life will likely be maintained well into old age or even exaggerated, unless non-normative individual experiences determine otherwise. And whether men become more like women and women more like men[31] seems to be specific to different cultures and individual life experiences. For good accounts of individual personality progressions from mid-life into old age, see Britton and Britton,[14] Maas and Kuypers,[41] or Reichard, Livson and Peterson.[51]

Age Differences in Motivation

Of particular interest here are the differences found between middle-aged and older adults in risk-taking behavior or cautiousness, perceived competence, social conformity, and changing value systems.

Cautiousness and risk-taking. Both reported and self-perceived declines in performance with age may often be a function of increase in cautiousness. For example, older persons may be less likely to guess in problem-solving situations unless risk-taking is specifically rewarded,[7] and they may often exercise the option of selecting the less risky course of action regardless of success.[12] Increased cautiousness may also result in the unnecessarily lowering of expectation levels.[46] One of the most important clinical interventions in early old age, therefore, may well be to help counteract the lowered willingness to take risks and explore new solutions, so necessary for continued high quality living.

Social conformity. Individuals of all ages are subject to social pressure, but with increasing age there is a tendency to become more susceptible. Age itself functions as a normative criterion for role definitions, age-related sanctions, and age-appropriate behavior.[43] It is therefore not surprising that older individuals tend to show greater congruence between their personal norms and what they think society expects of people their age.[45] With increasing age, therefore, many individuals become more acceptant of social stereotypes, and, due to perceived social pressure, are also more subject to advertising schemes and

consumer fraud. Again, educational intervention and therapeutic techniques designed to enhance perceived self-worth may be important in maximizing the individual's potential for effective functioning.

Perceived competence. Changes in behavior often occur as a function of altered attributions of the demands of a given situation in relation to the perception of one's relevant competencies. Little information exists on this topic, but some data from our studies of the attributes of situations in which older persons must display competence are relevant.[60, 66] In general, most older adults perceive themselves most competent in situations that are judged to be common, do not require social interaction, have a low activity level and are perceived as leading to positive outcomes. Conversely, situations are thought to be most difficult if they involve social interactions of an uncommon nature. With increasing age, however, social interaction is perceived as less competence-threatening than solitary activities, but the perceived favorable outcome increases in importance as a factor for positive attribution of a given situation.

Value systems. Substantial generational differences have been found in judgment about behavior having personal and social implications, the oldest generation being most severe in its judgment.[48] But there is reason to believe that value changes also occur within generations as we get older. I have recently suggested a model of adult cognitive development that includes four adult stages of development under which value changes may be subsumed.[56] These stages are: acquisitive, achieving, responsible, and reintegrative. They seem to fit well the data on value changes reported by Lowenthal, Thurnher and Chiriboga.[40]

During the stage of skill *acquisition* occurring in childhood through young adulthood, instrumental material values seem to dominate. Once maturity is attained, young adults strive to *achieve* by integrating role independence with the assumption of responsibilities during the stage of family formation. Lowenthal *et al*[40] here found a decline in instrumental-material and increase in personal growth values. Middle age, the *responsible* stage, involves long-term goal integration and the attainment of increased problem-solving skills. During this period, Lowenthal found a decline in personal growth values, with concomitant increases in interpersonal-expressive values. Finally, during the *reintegrative* stage, marked by the onset of old age, there is a relinquishment of occupational and family obligations and increased simplification of cognitive structures by selective attention to egocentric meaningfulness. During this stage, Lowenthal found a decline in interpersonal-expressive values and an increase in instrumental-material and hedonistic values, particularly in men.

It is once again not clear whether these observed value changes are characteristic of today's cultural setting and the early socialization of older persons, or whether such value changes are indeed characteristic of normal aging. The observed patterns, however, mark the seeds of intergenerational conflicts as the numbers of elderly increase. But perhaps the selfish-appearing values of some of our elders may be no more than a reasonable defense against an ageist society.[53]

IMPLICATIONS FOR THE MAINTENANCE OF MENTAL HEALTH

A number of implications for the work of the mental health practitioner have been suggested throughout this presentation. In this final section some further implications will be focused on the topics of primary prevention of psychopathology, psychosocial diagnosis, and therapeutic intervention.

Primary Prevention

The period of the life course extending from middle age into early old age is often characterized at the outset by the height of social and economic success as well as physical well-being. But slowly changes occur which for most of us are simply a somewhat lower level of physical and psychological energy, accompanied by society's subtle and open pressures to make room for the next generation. It was noted, however, that the documentable quantitative changes in learning ability, intellectual competence, and other contextual behavior are relatively small, and often within the realm of individual and environmental compensatory interventions. The evidence is strong, also, that individual differences in the maintenance of behavioral competence are related primarily to the person's state of health and the opportunities and tendencies to be fully involved in a stimulating environment.

There are three broad areas likely to be of major importance in assuring that the transition from mid-life into old age is accomplished successfully. The first is concerned with a major educational effort with respect to the media and the public services sector. Many of the disabilities of early old age are directly related to stereotypes about aging which become self-fulfilling prophecies. It is important, therefore, to urge the media to concentrate on the 95% of the elderly population who are not institutionalized, to report on and show successful older individuals, and to portray the elderly as active participants in our society. Similarly, in the public service sector it is important to train personnel to be more understanding of the moderate changes occurring with age and to value the older client as being equally important and deserving of high quality service and attention.

The second area is that of health education. While an increasingly successful job is being done in convincing the general public that dietary, smoking, and drinking behavior must be controlled in mid-life to assure physical fitness in old age, a similar major effort awaits us in the mental health area. Such efforts begin with urging individuals to monitor and seek adequate compensation for sensory changes, both by regular fitting and modification of eyeglasses and hearing aids, as well as suitable modification of working and living environments to maximize vision and audition. They continue with organized efforts to teach stress management and personal energy conservation on a large scale, and they must include selling the public on the notion that mental health problems in later life are as important and worth treating as at younger ages. Particular emphasis must be placed on the development of obsolescence-reducing educational mechanisms and their wide-spread use. There are pressing mental health objectives for urging greater allocations of educational funds for adult and continuing education facilities which most likely will bear the

major share of mental health education activities for our older citizens.

The third area is the transition from the world of work to that of (sometimes enforced) leisure. Recent changes in mandatory retirement legislation make it more and more likely that retirement will become an increasingly complex decision process, since the arbitrary guideposts of chronological age will now provide constraining time frames rather than specific time points. To meet the challenge of changed social policies, industry is likely to become interested in and offer flexible retirement plans. While these developments open new options and opportunities for the person moving into old age, they also introduce much uncertainty. It is likely that mental health professionals will have to become increasingly active in preretirement counseling programs, including formal evaluations to help workers and their employers to appraise their needs and abilities as they relate to the retirement decision.

Psychosocial Diagnosis and Therapeutic Intervention

The increasing number of persons reaching old age in good physical condition but with many resultant personal fears and conflicts is likely to create a substantial increase in demands for mental health services. Within the current economic climate, it is unlikely that these demands will result in the development of clinical specialties providing exclusive services to the aging target population. However, there will be a great need to provide additional training for many professionals concerning the issues addressed in this paper. In addition, there will be need for at least some specialized consultation centers and resource panels to provide back-up for many mental health and social service facilities.

As we have indicated earlier, there are substantial questions about whether clinical assessment tools devised for young adults are likely to retain their validity in work with older adults. Because of the interaction of sociocultural change and intraindividual development, test norms are likely to require more frequent updating than has been the case thus far. Specialized techniques geared to the problems of the second half of life which possess greater ecological validity than what is now available must be developed. In the interim, practicing clinicians must learn how to adjust their interpretations based on instruments that tend to produce systematic biases. (For further elaboration of these matters, see Schaie and Schaie.[63]) This is particularly important as mental health professionals become increasingly involved in assessments that may lead to forced retirement or restriction on personal freedom through involuntary institutionalization or the imposition of guardian or conservatorships.

In the area of therapeutic intervention, it behooves us to keep in mind the increasing physical fragility of the aging organism but to remember that a high level of psychological functioning will remain in most clients until the end. Indeed, one of the great risks of social service and other milieu type intervention is the creation of unnecessary and often premature dependency conditions for the aging individual. Maximum effort must therefore be placed on supportive services and individual rehabilitative efforts designed to permit the individual to exercise as much personal freedom as possible. It is the individual who has options, who can develop a meaningful role, and who can maintain self-worth, who will be most resistant to the ravages of time. The goal of mental health intervention in the process of aging, therefore, should be to deal with presenting symptoms as at any age, but then quickly turn to an examination of how the client can be helped to experience conditions of life, that permit a qualitatively satisfying existence.

CONCLUSIONS

It has been the purpose of this position paper to indicate some of the psychological changes from mid-life into early adulthood which may interfere with the continued maintenance of a high level of mental health. It has been underscored that many of the observed changes, while statistically reliable, are quantitatively of limited importance for many individuals until relatively late in life. Many of these changes can be adequately compensated for by minor adjustments in personal behavior and environmental support systems. Others are important primarily because they lead to adverse social stereotypes with accompanying restrictions imposed on the older person. The quality of life in developed societies can be readily sensed from the manner in which transition from mid-life to old age is accomplished with a minimum of stress and the preservation of maximum personal freedom and opportunities. Mental health professionals have a large stake in ensuring that our society will pass this test.

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