

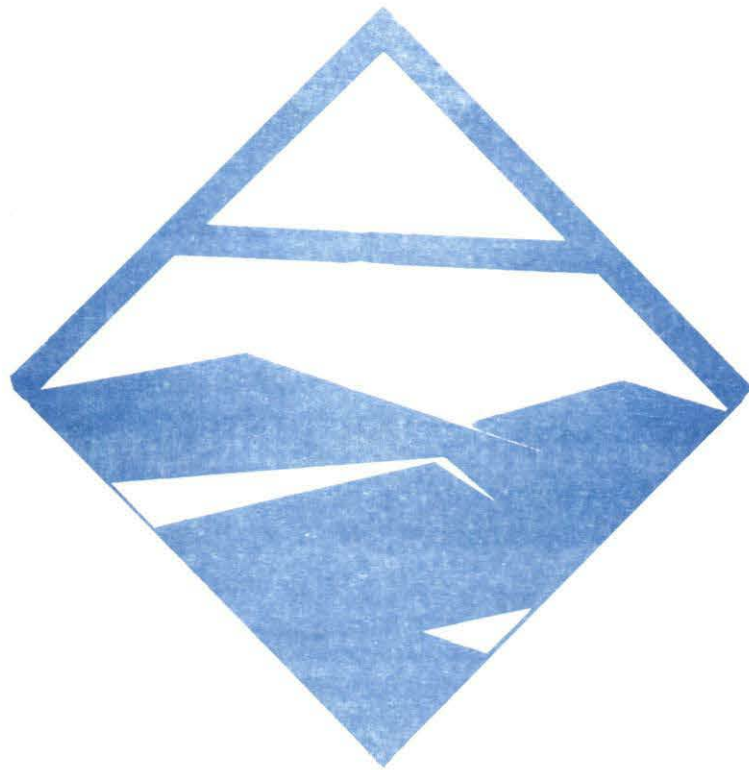
Teacher Training Reading Syllabus

MONOGRAPH ONE

Too Old to Learn?

by

Jack Botwinick and Husain Qazilbash



APPALACHIAN ADULT EDUCATION CENTER

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INTRODUCTION

This monograph covers findings of research in gerontological psychology as related to adult education. Discussed under the heading "Aspects of Man," by Jack Botwinick, are intelligence, speed, learning, perception, and personality. Discussed under the heading "Too Old to Learn," by Husain Qazilbash, are intelligence, involvement in information-seeking activities, and educational achievement. Each section is followed by its own references.

This monograph has the purpose of acquainting the trainer with research on the ability of adult students to learn.

The Editors

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ASPECTS OF MAN*

by Jack Botwinick

In this paper, reference to young adults usually means people in their twenties, extending into the thirties and dipping into the late teens. Reference to elderly people, the aged or the old, usually means sixty-five years and over. Sometimes it means people in their early sixties.

Intelligence, That Which the Test Measures

It has been said that developmental growth curves, determined either by the cross-sectional method or by the longitudinal method, are based upon increasingly biased samples of subjects as one moves up the adult age periods. The initially superior tend to survive and be available for late-life testing, and the initially inferior die or otherwise become unavailable.

The fact that over time the proportion of initially superior subjects in the sample increases becomes disquieting when one examines the developmental curves of intelligence in later life and finds that they are curves of decline. If the initially less able were more adequately represented in the older age groups, the trend of decline would be even greater. It

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is necessary, however, to keep two issues in mind when considering developmental curves. First, individual differences are so great that, when dealing with persons rather than with groups, the curves may actually be misleading. The curves probably reflect much of what is in the general nature of man, but they do not reflect much about any one particular man. To know about one particular man, it is necessary to test him individually. It is not possible to predict the individual from the group. A second reason for not being overwhelmed by developmental curves of intelligence is that the decision of which test to use, or what items to include in constructing a test to measure intelligence, is crucial. Intelligence is in part defined by decisions about tests, and the age changes in intelligences are measured by those tests. For example, Demming and Pressey reported results of a test based on practical tasks in which they tested subjects on the use of the yellow pages of a telephone directory, on common legal terms, and on obtaining services needed in everyday life.¹ They found a rise in scores through the middle and later years with this test, even when the subjects declined in their test scores with the conventional tests.

Demming and Pressey's results demonstrate that not all functions decline with age. Moreover, those functions that do decline do so at varying rates. Developmental curves of adult intelligence based upon the Wechsler tests (1944, 1948) clearly show a varying rate of decline. Each version of the Wechsler test comprises eleven subtests, and each of these subtests reflects a different rate of change with age. To examine

this variation comprehensively, the results of ten aging studies based upon the Wechsler tests were combined.² In each of the ten studies the subtests were ranked to show how elderly subjects performed on them. In this report, 11 represented the best score and 1 the poorest score; for example, if in one study a group of elderly people were found to have performed best in the vocabulary subtest, vocabulary would be ranked 11. If in another study the subjects performed second best in vocabulary, it would be ranked 10. The mean rank of vocabulary, combining these two studies, would be 10.5. The subtests Information, Vocabulary, and Comprehension were the three highest ranked; and Block Design, Picture Arrangement, and Digit Symbol were the three lowest ranked. These rankings are remarkably similar across the ten studies. They reflect what has been referred to as "the classic aging pattern." A group of functions referred to as "verbal" hold up with increasing age, and a group of functions referred to as "performance" do not. However, performance is a poor term since all assessment is based on some aspect of behavior, including verbal performance. Not only do functions such as vocabulary seem to hold up with age, but in very bright people vocabulary scores have been found to improve with age.

What do the top and bottom ranked subtests measure? When similar data were examined with the highly mathematical technique of principal component analysis, Birren, Botwinick, Weiss, and Morrison suggested that tests similar to the three top-ranked subtests measure achievement and tend to be related to general experience in our culture.³ This

achievement and experience can be regarded as stored information. Performance tests seem to measure manipulative skills, perceptual functions, and the processing of new information. These are the subtests ranked lowest in maintainance with age.

Speed of Response Involves Attentive Expectation

The specific procedures involved in the subtests involve speed of responding for the bottom-ranking tests but not for the top-ranking tests. This observation led to a controversy regarding the significance of loss of speed in old age. One extreme held that the observed slowing is a matter of the muscles only and thus is of no consequence to cognition. Psychometrically, it was argued, speeded tests are unfair and inappropriate for testing the elderly. The other extreme held that speed of response is a reflection of central nervous system functioning and as such is crucial to cognition. Proponents of the latter view held that speeded tests are not only appropriate in testing the elderly, but are desirable and necessary. This controversy has been discussed in greater detail in a different report where still a third view was described.⁴

Doppelt and Wallace gave the Wechsler Test (WAIS) both with and without time limits, and the age patterning of scores was essentially the same in both conditions.⁵ From a psychometric viewpoint, therefore, the controversy centering upon speeded tests no longer seems of great importance. From the point of view of understanding the loss of speed, however, questions remain. What are the antecedents of the loss?

Does the loss of speed affect skills and other performances? Most studies seem to show that slowing with age is more than just a matter of the muscles. It still is not clear whether the loss of behavioral speed is a reflection of slowed rates of neural conduction within the central nervous system. Studies have shown, however, that behavioral slowing may be a function of transient states of the responder; for example, the readiness or state of expectation of the responder determines how quick he can be.

The literature relating to the issue of readiness is extensive and very technical, and it is only necessary to describe here a few studies which highlight main points. Weiss, and later Botwinick and Thompson, segmented reaction time (RT) into two component parts--premotor time and motor time.⁶ Premotor time includes the time it takes to process the input of the stimulus and to associate this input with the appropriate behavior. Motor time is essentially the peripheral, muscle portion of RT. Elderly adults were found to be slower than young adults in both the premotor and motor components of RT. The premotor component was regarded as the more important because it constituted approximately eighty four percent of the total RT, and because it paralleled RT in its relation to an experimental manipulation of states of attentive expectancy.

Attentive expectation of an environmental event - that is, stimulus--permits the responder to get set and respond quickly. Conversely, when a person is surprised by the stimulus, either because he did not expect it or because he expected its arrival at a different point in time, he

responds slowly. RT is fastest when the conditions of anticipation or expectancy are optimal; RT is slowest when conditions do not favor accurate expectancy.

In a RT study the conditions of expectancy are manipulated by the preparatory interval (PI), which is defined as the duration of time between a warning signal and the stimulus indicating the need for response. If the PI is the same from one RT trial to the next, it is called "regular," and if the PI is varied from one RT trial to the next it is "irregular." The extent to which elderly and young people differ in speed of response depends not only upon whether the PI is regular or irregular, but upon the specific time duration of the PI. When the PI is long, that is, 6.0 seconds, the difference in RT between old and young is nearly twice that when the PI is short, that is, 0.5 second. One reason for the difference of RT with length of PI by age is that with longer periods of sustained expectation, attention and concentration are taxed. It is with the taxing of attention that the elderly perform particularly poorly. Even with a task as relatively simple as speed of response, the age pattern varies as a function of context. Not all situations reflect slowing to the same extent; some contexts maximize the extent of slowing and some minimize it, although almost all situations reflect some slowing.

Learning -- Process and Act

The importance of slowing with age depends upon the extent to which speed is involved in a particular act. It is often overlooked that

what is commonly called "learning" involves some behavioral expression which in itself is not learning; for example, one must speak or do something to demonstrate learning. If loss of speed is reflected in the speaking or doing and this makes performance poor, it does not mean that the learning itself is poor. Psychologists emphasize the distinction between learning (the process) and performance (the act expressing the process). In the analysis of learning in late adulthood much effort has been directed to the questions of whether learning itself falls off with age, or whether it is only the learning performance that does.

Laboratory studies dealing with the problem of learning versus performance have involved simple rote tasks of paired-associate and serial verbal learning. In paired-associate verbal learning the experimenter presents a series of paired words to the subject who must learn the pairing. Preceding each pair in the list, the first word of the pair (the stimulus word) is presented by itself. When the pairing is learned, the subject is able to anticipate and supply the second word (the response word) without further information.

Canestrari varied the time period between word pairs so that he had three pacing or speed-of-stimulus-presentation conditions.⁷ He had a fast-paced condition in which each word pair was exposed for only a brief period of time with a similar brief period before the next word pair appeared. Fast pacing made the task one of assimilating rapidly changing information. Canestrari also had a condition involving

slower pacing and one in which the subject paced himself. In the self-paced condition the subject controlled the apparatus to get as much time between words pairs as he desired. Canestrari found that the largest difference between an elderly group and a young-adult group occurred in the condition of fastest pacing, and the smallest difference between age groups occurred in the self-paced condition. A large proportion of the poor learning performance seen in advanced age may be accounted for by loss of speed, rather than decreased learning ability as such. However, the performance of the elderly were poorer than those of the young in all three conditions of learning, including the condition of self-pacing. A learning disability in the aged cannot, therefore, be totally ruled out,

Arenberg carried out two studies, the first of which was similar to that of Canestrari. His second experiment was more complicated but also more informative.⁸ Arenberg had elderly and young adults learn paired words using a procedure in which paced and self-paced trials were alternated. One group of each age experienced fast-paced trials alternated with self-paced trials, and a second group of each age experienced slow-paced trials alternated with self-paced trials.

The major test in Arenberg's study involved a comparison between learning on the self-paced trials which followed the slow pacing and learning on the self-paced trials which followed the fast pacing. If the older subjects had poor scores during the fast-paced trials simply because of an insufficient time to respond and not because

of poor learning, then their performance during the subsequent self-paced trials would be good. On the other hand, if the older people were not able to learn during the fast-paced trials, then their performances would be poor during the self-pacing which followed. Arenberg's results showed that the scores of the older group, as compared with the younger group, were poorer in the self-paced trials which followed the slow-paced ones. His conclusion, therefore, was that the poor performance of the old group during the fast pacing could not "be attributed to insufficient time to emit a correctly learned response."⁹ Once again speed of response affected the performance of the elderly, but poor learning could not be ruled out.

Eisdorfer, Axelrod, and Wilkie tested serial learning performance for the same purpose of distinguishing between the process (learning) and the act (performance).¹⁰ In serial learning single words are presented one at a time. The subject anticipates the next word in the list and tries to verbalize it before the experimenter presents it to him. Eisdorfer, Axelrod, and Wilkie presented the words to be learned in one of three exposure durations -- brief, long or in between. Elderly adults improved their learning scores as the time allowed for viewing the words was made longer. Interestingly, young adults made their best scores with the middle exposure durations and their worst scores with the longest stimulus durations which tells us something about the preferred pacing of older and younger people. Again, in each condition

the scores of the elderly subjects were poorer than those of the younger ones, possibly reflecting a true learning deficit.

The tasks used in the studies described above involved rote learning of material which had no relevance for the subject. What data are available with regard to meaningful life tasks? The number of studies involving meaningful life tasks is limited and they are often of poor scientific quality. The more an investigation is centered in the factory or in other natural settings, the more difficult it is to have proper experimental controls. Shooter, Schonfield, King, and Welford reported that the results of studies in natural settings tend to fall into four categories.¹¹ To assess competence, workers are either: (1) graded in examinations taken during or at the end of training programs; (2) rated by training staff; (3) marked on the basis of length of training necessary to reach a given criterion of performance; or (4) evaluated by measuring the progress of the work itself when training is given on the job. The authors indicated that the first three types of evaluation tend to show decline with age, whereas the fourth tends to show neither decline nor improvement.

Perception -- The Processing of Sense Data

In later life there is a decrease in sensory acuity which diminishes the effective intensity of physical environmental stimulation. Diminishing intensity of stimulation determines in part the world in which older people respond, but if the decrease in acuity does not reach an extreme form, it does not need to present a very great problem.

Corrections of sensory acuity can be made, as seen by the increasing use of hearing aids and stronger eye glasses, as people age. Corrections are also made by the tendency in the aged to rely on more than one sense at a time. A famous neurologist, for example, once described his observation that young people tend to drink water from a glass without any apparent visual attention to the glass. The kinesthetic and proprioceptive cues are sufficient to carry out the drinking. However, some older people, particularly the impaired aged, tend to monitor their drinking by a close, visual watch.

An experimental analysis of the tendency for older people to look at what they are doing was made by Szafran.¹² He had industrial workers of widely varying ages locate targets with a pointer under two conditions; (1) when direct vision was permitted, and (2) when the use of goggles made it possible to see the general display but not the targets or pointers. Szafran reported that when older workers were unable to make use of vision, they had special difficulty in locating the targets. They tended to make postural adjustments, turning their heads and often bodies in the direction of the particular target to be located.

How Man patterns his world is not only a matter of what his senses pick up. His central nervous system processes the sensory inputs, and his decisions and behaviors reflect this processing. Szafran's data may be more revealing of the difficulty older people have in processing inputs than of their disability in peripheral

sensory functioning. When a stimulus input is ambiguous or strong, individual differences in the perception of the input are small. Accordingly, ambiguous or weak stimuli are often used in studies designed to examine individual differences.

Basowitz and Korchin tested a young adult and an elderly group of subjects with two tasks.¹³ One task, called Gestalt completion, involved a set of drawings. A portion of each drawing was obliterated and had to be supplied perceptually by the subject. The other task involved finding simple geometric figures embedded in complex designs. Basowitz and Korchin reported that the young group performed each of these tasks better than the elderly group, but of special interest was the kind of error the older people tended to make. They omitted many items altogether. Basowitz and Korchin suggested that the older people may have manifested a type of excessive caution, "a defensive reluctance to venture response for fear of recognizing their inadequacy."

A changing pattern of stimulation was used in another study by Korchin and Basowitz.¹⁴ They compared elderly and young adults on a series of thirteen line drawings. The first drawing portrayed a cat which by successive modifications in subsequent drawings became a dog. The most ambiguous drawing was the seventh in the series--it was as much a cat as it was a dog. The younger subjects changed from "cat" to "dog" near the center of the series and continued with that response. The older subjects tended to shift from "cat" to "dog" later in the series and tended to vacillate more, shifting back to the response "cat" after having reported "dog." These data were inter-

puted as reflecting susceptibility to novelty and to potential threat in the situation on the part of the elderly.

Korchin and Basowitz's study was followed up by one in which both the cat-dog series and a triangle-circle series were presented.¹⁵ The latter series were comprised of twenty-two photographs of drawings, the first of which was an isosceles triangle and the last a circle. The results of this study conflicted with those of Korchin and Basowitz, but the instructions to the subjects were different. In the study by Korchin and Basowitz the older subjects shifted percepts later in the series than did the young; in the Botwinick study the older subjects shifted earlier in the series. The instructions used in the Botwinick study were more structured than those used by Korchin and Basowitz. Korchin and Basowitz asked the subject, "Is it a cat or a dog?" -- that is, the set to shift was not emphasized. They found the older subjects to be uncertain and vacillating. In the Botwinick study the end points of the stimulus series were indicated, the set to shift was clearly given, but the opportunity to vacillate was restricted by the termination of the procedure at the point of shift. With a very structured procedure, there was no uncertainty and, of course, no vacillation. Decisive, early shift of response was made by the elderly. The combined results of Korchin and Basowitz and Botwinick suggested the hypothesis that given appropriate structural sets rather than the opportunity to develop them, the older person will respond with minimum difficulty. The problem becomes difficult for the aged to the extent that a lack of structure, uncertainty, and the need to

change patterns of thought are prominent. An alternate hypothesis may be that the instructions emphasizing shift of percepts were more compelling for the old than young. The old may have been more susceptible to the instructional set to shift; they may have feared to fail reporting the change.

The inclination to shift percepts was examined more directly in two very similar studies. In the first, Botwinick, Robbins, and Brinley presented young adult and elderly subjects with Boring's ambiguous figure, commonly known as "my wife and my mother-in-law" which can be seen either as a young woman (wife) or as an old one (mother-in-law).¹⁶ Of those reporting either percept, ninety-four percent of the elderly subjects reported seeing the "wife" while only seventy-eight percent of the younger subjects did. Does this suggest the possibility that for the elderly denial of old age was operating to affect the perceptual processes? Although this question was in mind in the second study, both studies had as their central purpose the determination of the quality of effects of perceptual preparation on young adult and elderly subjects in terms of their inclinations to shift from one percept to another.

After the subject reported either "wife" or "mother-in-law," he was encouraged to perceive the alternate percept. If he could not so perceive the alternate percept on his own, he was shown a photograph of an unambiguous version of the percept he could not see; for example, if a subject saw "wife" and could report the alternative percept, he was

shown an unambiguous photograph of "mother-in-law." Later, without comment, he was shown the ambiguous photograph again and asked what he saw. The results demonstrated clearly that the older subjects tended to keep seeing the same percept, while the younger subjects easily reported the alternate one. The conclusion from these results was that the elderly demonstrated either a lower ability to form percepts, a greater difficulty in reorganizing percepts when formed, or both.

The second study was carried out to replicate the first, but used a better balanced male version of the ambiguous figure, "my husband" and "my father-in-law."¹⁷ It was thought that if ninety-four percent of the elderly saw the "mother-in-law," then perhaps this drawing was too structured for the elderly to reorganize. The results of the study with the male figure were essentially the same as those with the female figure. Approximately seventy-seven percent of the elderly saw the "husband" as compared to fifty-four percent of the young. Again, reorganization of percepts was not as readily reported by the elderly as by the young adults.

The reason for the elderly reporting the young "husband" percept more often than the young subjects again may be that they denied old age. However, another explanation is at least as feasible and probably more so. In both male and female versions of the ambiguous figures, the old percept figure comprised the total photograph. The young percept figure comprised only a middle section. To see the "old" figures called for greater ability in perceptual organization or integration than seeing the "young" figure.

The elderly subjects may have been more deficient in such perceptual organization and integration. The study which is necessary in order to tease these alternate possibilities apart would involve old and young percept figures varied with respect to the area of the total figure covered. Such a variation might be made along with assessment of the subject's acceptance of and adjustment to old age.

Personality--The Pursuit of Self-Esteem

It should be very clear that complex perception may be viewed as a manifestation of personality. The perception studies discussed above raise questions about denial mechanisms, about defensive reluctance to venture response, fear of recognizing inadequacy, and fear of failure. These interpretations provide clues to some of the themes in the literature on personality. There are hypotheses suggesting that many older people question their abilities, their roles, and their self-worth. Their behavior is often characterized by avoidance. One interpretation of this avoidance is that it wards off the possibility of failure, and thus maximizes the opportunities for self-acceptance.

The concept of avoidance, better known as disengagement, is probably the most thoroughly researched one in the study of personality in later life.¹⁸ In its simplest form the concept of disengagement asserts that with increasing adult age there is an increasing tendency to dissociate oneself from people and activities. As the concept was originally expressed, this dissociation was a normal event, conceived as the

inevitable behavioral counterpart of biological decline. A controversy developed, not about the observation, but about whether the dissociation was normal, inevitable, or desirable.

There are two questionnaire studies which bear on the controversy concerning the normality of disengagement, although neither one was designed for this purpose. In the first study¹⁹ elderly and young adults were asked to make a series of decisions, each involving risk. The alternative courses available in each decision were either to continue with an undesirable but tolerable situation, or to take action which if successful would remedy it, but if not would make the situation worse. The subject was told that he could decide to risk action on the basis of the likelihood of its success. He could risk if there were 9 chances in 10 that the action would succeed (conservative choice), if there were 7 chances in 10, 5 chances in 10, 3 chances or only 1 chance in 10. The least cautious or conservative response was scored 1, the next 3, and so on. The subject was also told that he could decide not to risk, regardless of the likelihood of success (scored 10).

The older people were more cautious in their decisions than the younger people, and this seemed to be an especially reliable result since it was seen in a North Carolina population after having been first reported in a Massachusetts population.²⁰ When the nature of the cautiousness of the older group was analyzed further, it was seen that much of the cautiousness was reflected in the decision not to choose the risky course of action regardless of the probabilities of success (the choice scored as 10).

It was recognized that the decision not to risk at all might be qualitatively different from the very conservative decision to attempt the risk only when the chance of success was great, such as 9 out of 10. If the two types of decisions are qualitatively different, the difference lies in the fact that the choice scored as 9 involves cautious risk behavior, whereas the choice scored as 10 involved avoidance. To test this, a second study of avoidance was carried out replicating the basic features of the first study, except that the choice to avoid (a score of 10) was not permitted.²¹ Decisions involving risk were required of all subjects, but the wide range of cautiousness or conservativeness was retained. The thinking underlying the study was that if the older people were truly more cautious in the sense that the original studies intended, they should choose the least risky alternative, that is, 9 chances in 10--now that the avoidance alternative was not permitted. However, if caution in this sense was not involved in the original results and avoidance behavior was, then old and young should be similar in their choices when forced to a decision where some risk was unavoidable.

The elderly were not different from the young in cautiousness scores when they were obliged to make a decision involving risk. The two studies taken together showed that when given the opportunity, the older subjects simply chose to leave the field. It seems possible that this type of disengagement reflects a fear of failure involving problems of social approval and perhaps self-acceptance as easily as it does

a loss of interest. The elderly subjects did not convey disinterest or poor motivation in the testing situations. Disengagement may best be seen as a defensive responsiveness to confrontations with the social forces of life, rather than as an unresponsiveness to the impact of the environment.

The two questionnaire studies discussed above are not traditional studies of personality. The more traditional studies are varied and difficult to integrate. The main reason for this difficulty is that many different tests have been used and these tests have generated different lists of personality traits or combinations of traits. In general, most of the investigators seem to end their studies unimpressed by the scope and magnitude of change with age in personality. Yet it is difficult to know what is impressive and what is not; for example, a typical finding using the Minnesota Multiphasic Personality Inventory (MMPI) is that there is a slight elevation of the D-scale score; that is, there is a slight but very consistent trend for a higher Depression score among the elderly than in the young. Less frequently found is a trend toward increased Hypochondriasis and Social Introversion scores. What does an elevation in the Depression score, especially when slight, tell us about the functioning life of older people with respect to depressive affect? All that may be said at present is that depression seems to be seen clinically in old age, especially among the aged who are in poor health.

Constriction is another personality characteristic of older people which sometimes is found. Constriction seems to be prominent in the Rorschach protocols; for example, Ames reported that older people tend to have fewer responses, a decrease in the variety of content categories, and an increase in the percentage of responses based upon form.²² However, individual differences were stressed, indicating that some elderly people tended to present just the reverse of this pattern.

Perhaps in contradiction to these findings, Neugarten, Crotty, and Tobin reported that when constriction was seen, it tended to be in men under sixty-five years old, and when self-doubting was prominent, it was in relatively young women.²³ Their results were based upon the Thematic Apperception (T.A.T.) type of test and an extensive battery of other procedures. It would seem, therefore, that the specific procedures and the definitions of concepts to which these procedures give rise, are important factors in describing changes. The authors concluded that on the whole "personality type was independent of age."²⁴

Considering the results of these and other studies, one emerges with a picture that is much in need of research clarification. Overall, the personality age trends seem small, but they may be important, nevertheless. There are conflicting signs in the literature, but constriction, social introversion, self-doubt, depression, and withdrawal seem to be characteristics that warrant further test. If these characteristics are personality trends in later life, then more attention to the elderly is required than simply trying to improve their performances. In any case,

it should be remembered that most studies have emphasized the slightness of the trends, and, more important, all studies have emphasized the large individual differences which occur in personality changes with age.

Summary and Conclusion

The growth in the number of research publications in gerontological psychology is reaching such proportions that unless more summarizing and integrating textbooks appear soon, the literature may get out of hand. The literature thus far usually has been based upon cross-sectional studies. Longitudinal studies are more adequate, but they are very costly and time-consuming. In addition, longitudinal studies are not without methodological problems. They, like cross-sectional studies, reflect increasingly biased samples as one goes up the age continuum. The initially less able subjects drop out and are not available for later retest.

Intelligence was briefly discussed. The observation was that not all functions decline with age; of those that do, not all decline at the same rate. One of the functions which does decline with age is the ability to respond quickly to environmental events. A controversy has arisen about whether this slowing is related to cognition. Whether it is related to cognition or not, the slowing does limit performance on a wide variety of tasks of intelligence and learning. This limitation in performance is exacerbated if complexity and lack of structure are introduced to the task. On the other hand, when conditions do not impose time limits, and when there is clarity and structure, older people may be expected to perform

relatively well. What may appear superficially to be poor learning ability may be partly a difficulty in performing quickly enough.

Much of the apparent learning deficit may also be an unwillingness to demonstrate what has been learned, for fear of being wrong and seeming incompetent. A fear of being wrong may stem from a loss of confidence in one's ability and in one's worth. The literature is not without its contradictions, but a loss of self-confidence is discussed often enough in relation to old age to warrant further test. Doubts regarding one's ability and self-worth may lead to depression, social introversion, and finally, withdrawal.

Individual differences are always prominent. When downhill trends are seen in old age, most often they are slow in developing. There is an urgent need for research focusing upon the compensatory adjustments used by the elderly and the teaching techniques and devices able to elicit and facilitate such adjustments.

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TOO OLD TO LEARN?

by Husain Qazilbash

Does intelligence decline with age, or is the frequently measured decline in intelligence with age a function of factors not necessarily related to the aging process? For example, is it possible that continuous participation in information-seeking activities contributes to the measurement of "general" intelligence as commonly measured by IQ tests?

A prevailing belief in our society is that one's intelligence, like most other psychological and physiological abilities, declines with age. The aphorism "you can't teach an old dog new tricks" sums up the prevailing cultural bias.

The basis for this widespread belief in our culture is, at least in part, the result of several major psychological studies. The following three conclusions were drawn from the studies in the field of adult learning.

- * Thorndike concluded that "adults can learn but at a slowly declining rate of about one percent a year from age 45-70 years."¹
- * Wechsler concluded "nearly all studies dealing with the age factor in adult performance have shown that most human abilities, in so far as they are measurable, decline progressively after reaching the peak somewhere between age 18-25. The peak age varies with the ability in question, but the decline occurs in all mental measures of ability including those employed in tests of intelligence."²

- * Shock concluded that "there can be no doubt that average raw scores attained on intelligence type tests diminish with increasing age. The decline in average scores begins in the twenties and continues at an increasing rate up to age 60; the extent and nature of decline in performance beyond age 60 is still uncertain."³

The above three statements and the conclusion of Miles and Miles,⁴ Jones and Conrad,⁵ Thorndike,⁶ and Pacaud,⁷ that intelligence declines with age, are based on cross-sectional studies on the change in intellectual achievement of adults.

In Johnstone and Rivera's study, one of the reasons adults gave when asked why they do not participate in adult education programs was, "I am too old to learn."⁸

The conviction that intelligence of older people does decline has important individual and social implications.⁹

First, those who are responsible for providing funds for educational programs for adults may show a reluctance to do so if convinced that these funds will be ineffectively utilized.

Second, adults who believe that their mental capacities have become seriously reduced will neither demand educational programs nor participate in them on any large scale.

Third, people responsible for the development of educational programs for older adults will not put forth their optimum efforts to design such programs if they believe that the programs will be of little educational significance.

Pressley and Kuhlén¹⁴ showed that scores on general ability tests were different for men of different types of occupations and they concluded that school and job training increases the ability of adults to score well on intelligence tests.

Norris reported that the older adult appears less successful with some types of test content than with others; he, however, attributed the differential decline to the fact that the quality and specificity of vocational experiences of adults affects test scores of some abilities.¹⁵

Nisbet (1957)¹⁶ reported a study of student training of teachers in Scotland who were tested in 1930-34 at an average age of 22.5 years and were retested in 1955 at an average age of 47 years. The test was a shortened version of The Simplex Group Test, which is composed of 14 subtests in two general categories, verbal and numerical.

In every one of the subtests, the scores increased with age and in 13 of them, differences between the two tests were statistically significant. The improvement was less marked in the numerical subtests than in the verbal ones.

That the level of formal education positively correlates with level of performance on intelligence tests is well established.¹⁷ Lorge demonstrated the relationship between level of formal education and level of performance on intelligence tests in a 1941 follow-up of boys first tested in 1921 in the 8th grade. In 1941 those boys who had

received additional schooling performed better on the tests than their equally intelligent peers at age 14 who had never gone beyond grade eight.¹⁸

Botwinick points out that the level of education and intellectual functions are highly and positively correlated. He further holds that ". . . it may be seen by these data, especially by the large general component, that the education of a person appears more important than the age of the person in relation to mental ability. It is very clear that it is important to evaluate the role of education in considering the effects of age."¹⁹

Thus, from the above discussion it is concluded that general intelligence of adults with higher levels of formal education does not decline with increasing age, and the empirical evidence is available to support the proposition that adults with a higher level of formal education engage in more information-seeking activities.²⁰

Brunner in summarizing the research pertaining to participation in adult education concluded "as one's education increases, so does his participation."²¹

Johnstone and Rivera concluded that a typical participant in adult education could be identified by the following characteristics: "younger than average adult (80 per cent were under 50 years of age), better educated than the average adult (an average of 12.2 years of formal education), better than average income, married, white-collar worker, and most often an urban resident."²²

Johnstone and Rivera also found that college graduates were six times as likely as those who had only a grade school education to participate in adult education activities--high school graduates were three times as likely to participate when compared to those with only grade school education.

Parker and Paiseley from Johnstone and Rivera's study concluded, when education is controlled in the analysis of data, no other personal or life-style characteristics set participants apart from non-participants in information-seeking. Even the racial differences disappear.²³

Greene (1962) in his study reported that high school graduates are found to be twice as likely to participate in adult education activities as compared to the high school dropouts.²⁴

Education, alone in Johnstone and Rivera's study, provided strong prediction of participation--"a person who had been to college . . . was about six times more likely to have been engaged in educational activities than a person who had never gone beyond grade school."²⁵

Thus, based upon the evidence presented, it is concluded that a low level of formal education, little or no participation in educational activities, and impoverished cultural and environmental conditions are the primary variables responsible for the decline in intelligence over time.

If the above explanations in support of the conclusion seem biased, it is imperative that we also look at some of the contrary evidence and their interpretations.

A few researchers have attempted to explain the findings, showing that intelligence declines with age. The resulting theories in general state that intelligence declines because adults reduce their general level of intellectual activity, and in some specific areas adults disengage themselves completely from the activity.

The first theory of "disuse" was formulated by Hovland;²⁶ his theory is that forgetting comes about because of the lack of use of retained material: impressions fade or decay with time because they are not exercised. Since it is possible for older people to have longer periods of disuse, it is possible to explain an age decrement in memory function on this basis. Whereas Osgood²⁷ contended that forgetting is a function of an absence of an event (use, exercise) rather than the presence of it. Time becomes a cause of forgetting rather than events or processes which occur in time.

Later both Hovland and Osgood²⁸ listed interference as a second theory of "disuse" and agreed that forgetting comes about because of competition from new material. Hovland²⁹ formulated another theory based on changed cues and expectations. This theory suggests that recall is best when conditions are most similar to those present during original registration and the subsequent recall.

Cummings³⁰ and her associates in 1960 introduced the concept of "disengagement." Their hypothesis asserts a reversal of a need for

expansion, i.e. , in later years the individual is motivated to disengagement. The disengagement theory proposes that in old age, psychological equilibrium accompanies passivity whereas at younger ages active participation is necessary for equilibrium.

Dean's Study (1960)³¹ has presented data on the decline in "instrumentality" in support of this theory of "disengagement."

The implication of these theories here is that if adults do not engage extensively in information-seeking activities, their performance on intelligence tests will decline.

Botwinick³² in his discussion of culture as one of the modifiers of intelligence points out that we may expect that limitations in environment limit the expression of potential intelligence. Exposure to information and opportunities to learn are aspects of total cultural context which influences the intellectual functions. Because these aspects change from generation to generation, it has been argued that it is unfair to compare old and young people when each age group is influenced by a different cultural context.

The study of an individual's pattern of educational efforts as a research approach for examining the extent of involvement in information-seeking activities was first suggested by Houle,³³ and subsequently discussed and investigated by Brown,³⁴ Scheffield,³⁵ Ingham,³⁶ Averill,³⁷ and Litchfield.³⁸ None of these studies have considered

the relationship between the extent of involvement in information-seeking activities and the intelligence of adults and their age.

Various studies have found that individuals with less than an eighth grade education, those from lower socio-economic levels, those from certain ethnic and cultural groups, and those over 55 years of age tend not to be involved in adult education programs. However, these latter groups are the ones for whom many adult education programs are particularly intended.

The purpose of these programs is to provide opportunities and resources to the adult population for their personal and intellectual development and to meet the growing needs of the society and technology. To do this, adults must be continuously involved in the information-seeking process that will not only enable them to keep up with developments but also to maintain or increase their general intellectual ability.

Since there is little evidence that adults learn less efficiently than younger people, research is needed to determine the extent that information-seeking alters the relationship between intelligence and age.

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