

The Assessment of Competence in Adulthood and Old Age

K. Warner Schaie

University of Southern California

Introductory Remarks for a Symposium presented

at the annual meeting of the

Western Psychological Association

Los Angeles, Ca., April, 1976

The Assessment of Competence in Adulthood and Old Age

K. Warner Schaie

University of Southern California

Several decades of psychometric studies of intellectual functioning in adulthood have led to the recognition that much of the apparent decrement seen in older adults may be a function of the cultural obsolescence of today's elderly as well as due to the criterion irrelevance of test materials standardized upon young adults (Schaie, 1974; 1976). That is, most psychometric tests of intelligence, whether based upon theoretical models of intelligence or upon discriminating among criterion groups, involve the implicit assumption that the construct of intelligence is useful in relation to educational or career entry situations. A further implicit assumption is the prevalence of competence motivation, which in the young makes it reasonable to utilize tasks for assessment which may have little or no meaning per se. This latter assumption may be quite erroneous when considering intellectual performance in the old, for whom valid tasks may require greater face validity and intrinsic meaning before maximum performance will be elicited (also see Schaie & Schaie, 1976).

A group of colleagues and students at the Andrus Gerontology Center have been pondering these issues with me over the past year, both in relation to the theoretical questions regarding intellectual functioning in middle and old age, as well as with respect to the very practical problems of assessing older persons' functional psychological age with respect to mandatory retirement and other age discrimination problems.

These discussions have led to some refinement of the issues and the

initial development of research approaches which might bear upon these issues. The purpose of this symposium is to offer a first report on what we expect to be a long-range research program.

The plan of the symposium is for me to distinguish between the constructs of intelligence and competence in the context of the history of assessing cognitive behavior in adults. Then there will be four formal position papers by members of our research group. These papers will deal first with the assessment of situations in which adults might be expected to display competent behavior. Second, there will be a discussion of the kind of tasks which will need to be used to assess competent behavior in adults in a criterion relevant manner. Next we will be concerned with the effect of cautiousness upon the display and assessment of competence in the aged, and finally we will deal with the trans-situational generalizability of a concept of adult competence. Two discussants well familiar with the psychology of aging will then respond to the papers, first from an assessment and then from a social-psychological point of view.

Let me begin by trying to distinguish between intelligence and competence. To do so it may be useful to engage in a historical analysis of at least five different models of intelligence which might be pertinent. The first is the old concept of the Scotch faculty psychologists, (Reid, 1785; Stewart, 1792) who thought of the mind's organization to pertain to classes of intellectual abilities, such as mathematical ability or philosophical ability. Such faculties might develop differentially, but in able or dull individuals could all be high or low. The faculty psychology model still lingers in the work on the measurement of distinct psychological functions by the founders of differential psychology, men such as

Galton (1883) and James Mckeen Cattell (1890). An empirical consequence for test development here is the search for operations which are direct representations of unitary traits of intelligence. But Wissler (1901) brought about the early demise of intelligence testing when he showed that tests of unitary traits showed only trivial correlation with socially significant consequences. Hindsight suggests that this should be so, since phenotypes of unitary traits ought to be situation-specific with respect to competence but generalizable across situations with respect to intelligence. Hence no single trait suffices in the expression of competence in a specific situation and optimal combinations of unitary traits would be required to elicit competent behavior across situations.

In contrast to the notion of specific mental powers, we must next note the influential view of Spearman (1927) who posits the existence of a singular, global concept of intelligence. Spearman believed that all intellectual activities contained something of a common element which he labeled the "g" factor. Individual differences among people in level of intellectual ability a la Spearman are consequently explained to be a function of the amount of "g" that individuals are endowed with as a function of their biological potential and the environmental input prior to testing.

Spearman's theory is empirically grounded, since he observed that when one studies the intercorrelations among test items one can find high agreement among items relevant to what appear to be measures of intellectual functions. However, contrary to Spearman's proposition that such a unity reflects some kind of mental energy, and I would propose instead that what is really measured is situation-specific competence

across diverse functional units of intelligence. And indeed, omnibus tests of intelligence (such as the Binet test and its successors) have tended to be quite successful, not because they permit the analytical study of intellectual ability, but rather because of their empirical validity in predicting performance in certain situations. There might conceivably then be a variety of "g" factors if one were to examine test items predictive of performance in non-educational situations. In a somewhat cavalier manner I would therefore propose that the Stanford-Binet is not really a test of intelligence but rather one of educational competence.

Thorndike objected to Spearman's concept of a single characteristic of general intelligence by arguing that one does not observe generality of intelligence but rather communality among the acts people perform. That is, the high correlations which Spearman observed between different measures of intelligence may be an artifact which occurs when individuals are tested over a wide range of ability. In that case the more able will excel on most tasks while the incompetent will do generally poorly even though individuals of high and low ability may vary widely within their own performance. Both Thorndike (1927) and Thomson (1948) therefore postulated that one could identify several factors of intelligence on which individuals might differ. Thorndike proceeded to classify intelligence by the type of task involved and postulated three distinct kinds of intelligence which he called abstract intelligence, social intelligence and mechanical or motor intelligence. The multi-factor model of intelligence requires the selection of test items which will have substantial variance with respect to certain areas of intellectual performance in

addition to loading on a general factor. The resulting test battery (of which the Wechsler tests are a prominent example) will therefore have only moderate correlations between its parts, some of the sub-tests may be akin to the earlier discussed functional unities of intelligence, others will be direct measures of situation-specific competence, and their sum (as expressed in a total IQ) will consequently yield a measure of competence for that situation for which the particular combination of component intellectual abilities is likely to generalize. With regard to the Wechsler tests this would seem to be situations in which educational competence is required as well as vocational-occupational situations in which education-related skills are to be optimized.

In an extension of Spearman's approach, Thurstone (1938) proceeded to analyze the correlations among a large set of different measures of intelligence by means of the then new technique of factor analysis (Thurstone, 1935). Thurstone studied the correlations among approximately 60 different measures of intelligence and concluded that one can identify a number of factors which have little or no relationship with one another. Intelligence might therefore be best described as the joint expression of many factors. In contrast to the phenotypic unitary traits proposed by the faculty psychologists, Thurstone's factors (as well as the even further explicated structure of intellect model of Guilford (1967)) represent genotypes. Such genotypes may indeed be the building blocks of intelligence, but paradoxically knowledge of an individual's standing on any one of them will not help us predict competence either in a specific situation or across classes of situations, except in the unusual case where one and only one genotype accounts for most of the

reliable variance in an observable behavior.

We now come to the Genevan model of intelligence (Flavell, 1963):

Here emphasis is placed on the genesis of morphological structures which

intelligence as basic to our understanding of the mechanics of cognitive behavior, but with competence as the manner in which intelligence relates to the problems of daily living. The early pioneers in the assessment of intellectual ability, working primarily with children and young adults, were fortunate in that the distinction between intelligence and competence may not be terribly important when criterion relevance is limited to a narrowly defined set of situations in an organism where the effect of novelty of experience may suffice to set up the required minimal incentive for adaptive behavior. As I have stated elsewhere (Schaie, 1976) the conditions for adaptive cognitive behavior which prevail during the life stage of knowledge and skill acquisition are no secure guide for that portion of life when such skills must be applied to responsible behavior in a highly differentiated environment.

When we review the history of the assessment of cognitive functions in adulthood we are left with the disquieting conclusion that the studies involving omnibus measures of intelligence such as the WAIS may be of no practical or theoretical interest because they trace development through adulthood on measures of competence relevant for situations which rarely if ever are faced by the middle-aged or the elderly. And studies of functional unities of intelligence, such as my own work with the Primary Mental Abilities (Schaie, 1974), suffer from the fact that while they may accurately reflect age changes and differences in intelligence, they may not account for most or even much of the variance in many situations requiring the expression of competency in adulthood and old age. Those genotypes of intellectual ability which have been carefully charted over the life-span may indeed explain most individual difference variance

in early adulthood; but other genotypes, those relatively unimportant in youth, may require more detailed assessment in later adulthood.

What then is to be done? First, we must learn more about situations in which adults are required to display competence, and this requires a taxonomy of adult situations. Next, we must construct new phenotypic measures of intelligence, based upon what we now know of the structure of intellect, but which do not require that novelty be the impetus for the subject's adaptive response. Instead, the phenotypic tasks must be meaningful and embedded in the life experience of the adult, and moreover attuned to the need for cohort as well as age relevance. Third, we must examine the mediating role of motivational variables and especially the effect of caution and risk-taking in response to cognitive tasks (cf. Birkhill & Schaie, 1975). And finally, we must investigate the potential generalizability of our new tasks across classes of situations and types of individuals, if we are to attain a technology which is to be scientifically valid and suitable for application to real life problems.

The four papers which follow will examine each of these issue complexes in greater detail, and will illustrate the manner in which our group is beginning to reconceptualize and develop a new approach to the assessment of competence in adulthood and old age.

References

- Birkhill, W.R., & Schaie, K.W. The effect of differential reinforcement of cautiousness in the intellectual performance of the elderly. Journal of Gerontology, 1975, 30, 578-583.
- Cattell, J.McK. Mental tests and their measurement. Mind, 1890, 15, 373-380.
- Flavell, J.H. The developmental psychology of Jean Piaget. New York: Van Nostrand, 1963.
- Flavell, J.H. Cognitive changes in adulthood. In L.R. Goulet & P.B. Baltes (Eds.), Life-span developmental psychology: Research and theory. New York: Academic Press, 1970.
- Galton, F. Inquiries into human faculty and its development. London: Macmillan, 1883.
- Guilford, J.P. The nature of human intelligence. New York: McGraw-Hill, 1967.
- Piaget, J. Intellectual evolution from adolescence to adulthood. Human Development, 1972, 15, 1-12.
- Reid, T. Essays on the intellectual powers of man. Edinburgh, 1785.
- Schaie, K.W. Translations in Gerontology-From lab to life: Intellectual Functioning. American Psychologist, 1974, 29, 802-807.
- Schaie, K.W. Toward a stage theory of adult cognitive development. Aging and Human Development, 1976, in press.
- Schaie, K.W., & Marquette, B.W. Stages in transition: A bio-social analysis of adult behavior. Paper presented at the satellite meeting of the International Society for the Study of Human Development, Kiryat Naavim, Israel, 1975.

References continued:

- Schaie, K.W., & Schaie, J.P. Clinical assessment and aging. In J.E. Birren & K.W. Schaie (Eds.), Handbook of the psychology of aging. New York: Reinhold-Van Nostrand, 1976, in press.
- Spearman, C.E. The nature of intelligence and the principles of cognition. London: Macmillan, 1927.
- Stewart, D. Elements of the philosophy of the human mind. Edinburgh, 1792.
- Thomson, G.H. The factorial analysis of human abilities. London: University of London Press, 1948.
- Thorndike, E.L. The measurement of intelligence. New York: Teachers College, Columbia University, 1927.
- Thurstone, L.L. The vectors of the mind. Chicago: University of Chicago Press, 1935.
- Thurstone, L.L. Primary mental abilities. Chicago: University of Chicago Press, 1938.