OLD WINE INTO NEW BOTTLES; A STAGE THEORY OF ADULT COGNITIVE DEVELOPMENT[1]

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Introduction

Throughout my scientific career, perhaps with the exception of a very minor transgression (Schaie, 1962), I have taken a strictly empiricist position and devoted myself to a description of cognitive change throughout the adult life span, utilizing what seemed to be the best available techniques for such description. Having become older, and if not wiser, at least less defensive about admitting to the possible utility of arm-chair speculation, I am now ready to confess agreement with the dialectic position, that taking no position, takes a position as well, albeit not an explicated position. Indeed, in my single previous theoretical exposition I took a regression view of aging (Schaie, 1962), while in my more recent integrative writing (Baltes & Schaie, 1974; Schaie, 1973, 1974; Schaie & Gribbin, 1975) I have opted essentially for a stability model of cognitive development.

Positions such as mine or those by writers such as Bayley (1968), Horn (1972) or Comalli (1970) imply a continuity position for age changes in adult cognitive development regardless of empirical findings as to decrement or stability of cognitive function. That is, no matter what we say, when we assess cognitive function by means of procedures found valid for young adults, we assume quantitative change in cognitive

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structures which remain qualitatively uniform throughout life.

In my own work, I have assiduously tried to show that most age differences in cognitive function are not ontogenetic in nature but are rather found because of the comparison of individuals belonging to generations differing in the asymptotic level of acquisition of acculturated materials in young adulthood. But even if there is little change over age on measures validated for the young, this does not tell us that the young and the old are cognitively alike. Indeed, simple observation requires us, on the base of face validity alone, to admit that there ought to be some qualitative differences. And, what I may have done over the past decades is to show, first, that old people do not necessarily show intellectual decrement on certain tasks developed for the young; second, that the old are obsolete rather than decrepit; but, unfortunately also that this does not help us much to understand intellectual functioning in old age. To demonstrate that Bananas taste like apples, does not transform Bananas into apples! It merely confirms the presence of applish-tasting Bananas.

My first clues regarding the problem with continuity models of cognitive development in adulthood came with my more appreciative digestion of reviews on changes in factor structure of intelligence across age. Some of this matèrial is certainly not new, since Cohen (1957) almost two decades ago reported changes both in the number and composition of factors derived from the Wechsler tests. But more recent discussions (Bentler, 1973; Nesselroade, 1970; Reinert, 1970) made it quite clear that it may be overly simplistic to interpret developmental change in adulthood as straightforward quantitative change.

A further persuasive argument was presented by an interesting study

by Alpaugh (1975) who investigated creativity in a group of school teachers sampled over the adult age range but equated for education and performance on the WAIS vocabulary test. In this group, creativity decreased with age, even though vocabulary performance did not. Now it is still possible that cohort differences in creativity which are independent of those in intelligence might account for this finding. I think not, but rather believe that once again qualities are measured in ways appropriate for the young but not necessarily for the old.

I feel compelled, then, to argue now that the processes which have been documented for the acquisition of cognitive structures and functions in childhood and during the early adult phase may not be relevant to the maintenance of functions and reorganization of structures required to meet the demands of later life. But if I adopt this position, I feel I must go a step further and begin to articulate an alternative model for adult cognitive development which might provide a blueprint for the development of new descriptive strategies. This is what I shall now propose to do.

Are There Adult Cognitive Stages?

It seems to me that all previous models for intellectual development are narrowly confined to what we might denote as the acquisition of problem solving skills. In a sense Piaget (cf. Flavell, 1963) merely describes successive modes of increased efficiency in the solution of problems which involve the acquisition of new information. Within such a sequence of increasingly efficient acquisitional processes it is quite possible to describe the extent to which different classes of problem solving have been mastered by a structure of intellect model (Guilford, 1967). But what happens when the young adult has reached some kind

of asymptote in this acquisitional process?

Flavell (1970) claims that childhood cognitive modifications involve formal "morphological" properties that result from the biological-maturational growth process underlying these changes. In contrast, he argues that "no such underlying process constrains and directs adult cognitive changes....the most important adult cognitive changes are probably the result of life experiences, and would for the most part be expected to lack the across-subjects uniformity that characterizes the child's intellectual growth."

I think Flavell is wrong on the first count; that is, the morphological basis of children's cognitive development has never been fully documented, at least not to my satisfaction. Children's cognitive growth then, is likely to reflect experiental factors as well, but it is experience relevant to the acquition of both process and substance. The adult experience on the contrary is likely to be relevant to quite different goals.

If we conceptualize cognitive growth as the stage of acquisition and postulate an asymptote for such growth in young adulthood, I believe, we have then by definition set forth a requirement for further adult stages. For if it be the purpose of the first part of life to acquire the intellectual tools needed to fully participate in the human experience, it then becomes necessary to postulate, if only on teleological grounds, that such preparation must have some further goals.

Now, it may be argued that survival into adulthood may be solely determined by the need for species reproduction. Even if this be so, in a species endowed with a prolonged period of immaturity, adult cognitive skills would as a minimum have evolutionary significance in their

contribution to the survival, protection and acculturation of the next generation.

I would like to suggest then, that the period of acquisition described, for example, by Piagetian models, whether mediated primarily biological or experiential events, in the main ends in young adulthood, and is replaced by other life stages, requiring different models.

What Is The Nature Of Adult Stages?

If we accept the notion that adult development stages occur in response to experiential phenomena, we must next consider the attributes of such phenomena. Let me suggest that our search should lead us to an analysis of changes in cognitive requirements posed by environmental press. Here the work of social psychologists and anthropologists (and most noteworthy, that of the Langley-Porter group under the leadership of Marjorie Lowenthal and her associates (1975)) concerned with the analysis of adult life transitions gives us important cues.

Throughout the period characterized by us as acquisitive, the young organism has typically functioned in a protected environment. We believe that an important qualitative change in the environmental press occurs when the young adult is required to establish his own independence. For one thing, his problem-solving behavior no longer can be an isolated phenomenon, the consequences of which we can be blunted by societal and/or parental protection. From now on, the adult will be held responsible fully and individually, and he must therefore embed his cognitive structures in a broader network, whose goal is no longer mere acquisition, but is now concerned with the achievement of competence.

I would like to suggest that the achieving state (which age-wise may occur anywhere from the late teens to the early twenties) requires

further progress beyond the processes associated with the level of formal operations described by Piaget and his disciples as occurring in adolescence. That is, we are now concerned with much more goal-directed formal operations; task resolution is embedded in the consequences of the solution for achieving independent social function of the organism. As a consequence, we would predict more efficient and effective cognitive function with respect to tasks which have role-related achievement potential, while the peak may indeed have passed for problem solving activities which are task-limited. Adolescence may see peak function in behaviors which are task-specific, respectively where the task, no matter how trivial, is important for the organisms in the sense of the acquisition of skills, regardless of their social implications. Young adulthood, in contrast requires goal orientation. Different peak ages found on the Primary Mental Abilities (cf. Schaie, 1970) would fit this contention.

The next postulated stage of adult cognitive development occurs when the individual has mastered cognitive competence to the point of implementing his role independence, and is now about to assume responsibility for other individuals (mate and/or offspring) at the inception of a new family unit. In western culture this transition would typically occur from the early twenties to the early thirties.

Transition to the <u>responsible</u> stage which extends in most individuals from the late thirties to the early sixties should again require qualitative changes in cognitive function. That is the free-wheeling style of the acquisitive period and the goal-directed entrepreneurial style of the achieving stage will be replaced by a pattern which facilitates integrating long-range goals as well as consequences for one's family

unit in the solution of real life problems. In laboratory situations, this should imply increased skills in relevant problem solving tasks, shifts in cognitive style to greater flexibility and lessened field dependence, gain in what has been described as the crystallized, but loss in the fluid abilities, the latter being of lowered relevance to the experiential demands upon the individual.

For some individuals, in the thirties and into the early forties, another stage may be reached which has been described by Neugarten (1969) in terms of the executive abilities of the middle-aged. The elicitative experiential press here would seem to be the assumption of responsibility for societal systems, instead of simple units, with the corresponding need to develop cognitive strategies which are efficient at integrating complex and high level hierarchical relationships. Here we should expect further gains on laboratory tasks such as pattern recognition, inductive thinking, and complex problem solving tasks, with corresponding lowering of skills in task specific situations as well as possibly some increase in difficulty in dealing with new bits of information as contrasted to the retrieval of past data.

For both the "responsible" and the "executive" stages, common psychometric tests of intelligence are likely to prove quite inadequate. The "building blocks" of intelligence are, of course, most important during the "acquisitive" and "achieving" stages, but they fail to tell us the whole story, when the emphasis of cognitive function changes to organizational, integrative and interpretive roles. Now it may be possible that a variety of task measuring problem solving skills and cognitive styles (e.g. Rimoldi, 1964; Schaie & Parham, 1975; Witkin, Goodenough, & Karp, 1967) may be suitable vehicles for measuring intellectual

competence at these stages of cognitive development. I fear, however, that it will be necessary to develop new measurement technologies which will borrow heavily on the information processing and systems analysis literature.

We have now described levels of cognitive development whose common mode is the need for the integration of acculturated intellectual skills at increasing levels of role complexity. It remains to consider a further stage or stages which will acount for cognitive behavior during that part of life when the extent of societal involvement and responsibility relaxes and when biological changes may indeed once again impose constraints upon cognitive function.

I believe that the final phase of cognitive development, which I have elected to denote as the reintegrative stage, completes the transition from the "what should I know," through the "how should I use what I know," to the "why should I know" phase of life. Adaptive cognitive processes, at this level of development may well operate in an orthogonal fashion to a young adult structure of intellect model. Cognitive processes here are most certainly moderated by motivational and attitudinal variables to a much larger degree when would be true at any other life stage, an intuitive recognition, which up to now has received only limited attention (and that only with respect to the attribute of cautiousness (cf. Botwinick, 1969; Birkhill & Schaie, 1975).

The transition to the "reintegrative" stage occurs at a time when the complexity of the adult cognitive structure has reached an over-load stage, and consequently demands simplification, and where environmentally programmed role requirements are reduced due to occupational retirement, relinquishment of responsibilities for children and family, and other

role restrictions previously described as "disengagement" phenomena. But the cognitive response is not that of disengagement at all, it is one of achieving more selective attention to cognitive demands which remain meaningful or attain new meaning. Thus problem solving now no longer occurs as a simple response to a competence-motivation linked stimulus situation, but requires meaning and purpose within the immediate life situation of the individual, or within the more cosmic interests of selected older individuals who exemplify what folk myth describes as the "wisdom of old age" (also see Kohlberg's (1973) description of his Stage 7).

Completely new strategies for the measurement of intellectual competence of the elderly will obviously be required. Such strategies, will first of all require an analysis of criterion variables relevant to the life experience and life roles of both the recently retired (or young) old and the very aged. Some of the pioneering work of Deming and Pressey (1957) may be illustrative, but the network of item content will have to be wide and the processes to be investigated need yet to be identified. The task will be no less than that faced by Binet in initially measuring the intelligence of school children.

Some Unfinished Business

I have now sketched some very gross outlines of my thinking on the characteristics of adult stages of cognitive development and the kind of operations that might be suitable for the differential investigation of such stages. I am quite aware of the fact that I have not addressed myself to the question of how my scheme related to models of adult development such as those suggested by Erikson (1963) or by Kohlberg (1972), some of whose stages may sound quite similar to mine.

More importantly I have not addressed other implicit issues in the construction of developmental paradigms (cf. Baltes & Schaie, 1973). For example attention will have to be given to the question of what might be the necessary and sufficient conditions for transition from one adult stage to the next, or whether such transitions imply substitutive or superimposed behavior patterns. Other issues yet to be dealt with concern the manner in which the increasing complexity of environmental press interacts with the individual's cognitive structure such that a change in shifting from one stage to the next is required. Also we need to specify just how a hierarchical model of cognitive complexity can be related to the motivational parameters which I have suggested may become predominant in moderating cognitive behavior in old age. Time does not permit a full analysis of all these issues within the confines of this presentation, but some of these questions will be addressed and the next installment of this story told at the satellite symposium sponsored by the International Society for the Study of Behavioral Development later this week (Schaie & Marquette, 1975).

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