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ADVANCES IN CHILD DEVELOPMENT AND BEHAVIOR

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IMPLICATIONS OF LIFE-SPAN DEVELOPMENTAL PSYCHOLOGY FOR CHILDHOOD EDUCATION

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I. Introduction

Baltes (1973) has outlined the ingredients of research paradigms derived from a mechanistic model (Reese & Overton, 1970) and discussed these paradigms with respect to research on behavioral development across the life-span. Baltes's formulation states that behavior is a function of response, organismic, and/or stimulus variables in present (i.e., concurrent) and earlier (i.e., historical) temporal periods. This view of research paradigms in developmental psychology does not lead to life-span research programs which are conceptually novel. Rather, it is the extension of the time perspective and the search for more distal antecedents that distinguishes a life-span view from traditional developmental conceptions (Baltes & Schaie, 1973). In this sense, a life-span view thrusts the developmental approach to its extreme form.

An implication resulting from a life-span developmental view for childhood intervention is that an educational or interventional program should be designed with special attention directed to the long-range, distal consequences of the intervention. This consideration is important for each of the three major classes of intervention: (a) corrective; (b) preventive; and (c) optimizing.

Corrective intervention is aimed at modifying "problematic" or disturbed behavior. The earlier in childhood that corrective intervention is instituted, the more likely it is that one can stop the disorders from being prolonged or becoming more severe and resistant to modification in later years. However, more empirical evidence is still needed about child-adult continuity of maladaptation or disorders (see, e.g., Clarizio, 1969; Robins, 1966).

Preventive intervention may be designed either to control (or hinder) the development of problem behavior or to promote behavioral characteristics which may facilitate the modification of disorders that would possibly develop in later years. Preventive programs with children are often based on the assumption that plasticity in the childhood years yields better "investment-payoff rates" (e.g., Cowen, 1973).

Optimizing intervention is aimed at the establishment of external conditions and/or internal prerequisites which would allow the "optimal" realization of certain "developmental goals" insofar as such goals can be formulated and justified. If one agrees with Jahoda (1958) that psychological well-being is more than being free from disorders, then this type of intervention will become more important. Optimizing intervention implies, moreover, the establishment of goals for "optimal human development"—a formidable new problem.

It may be argued that life-span developmental psychology has yet to offer enough data or empirically validated hypotheses to substantiate intervention programs. At the same time, however, life-span developmental psychology does offer viewpoints and questions which are very provocative and should have consequences for future research. Some of these questions and some of the

attendant theoretical and methodological problems are addressed from the perspective of childhood education in the following sections.

II. Contributions of Developmental Psychology to the Establishment of Educational Goals

A. ON DEFINING SOCIALIZATION GOALS

As long as one supports the notion of "programmatic developmental models" (Brandtstädter, 1975), developmental psychology can at the utmost contribute to the derivation of developmental goals from "ultimate goals." The establishment of ultimate goals for human development is primarily an extrinsic concern of psychology. The goals, rather, are rooted in historical, cultural, religious, and anthropological traditions (e.g., Riegel, 1973) and may lead to one of three major viewpoints focusing on: (a) requirements of a future society and its ecology (e.g., individuals should be enabled to adapt smoothly to future external conditions); (b) conceptions and models of the ideal personality or ideal human being (e.g., the "autonomous nonconformist," the "emancipated woman," the "cultivated man"); and (c) conceptions of the ideal man-environment interaction (e.g., the "socialistic individual in the socialistic society").

Developmental psychology will not prescribe what the ultimate goals of individuals should be but may contribute by providing knowledge about how individuals can develop toward any of these ultimate goals. These developmental routes may be mapped by first deriving "subgoals" from ultimate goals through technological transformations of developmental theories and, then, by hierarchically ordering the subgoals defining them on different levels of goal hierarchy in terms of a behavioral network. Studer (1970) has demonstrated such an approach in the area of environmental design.

Socialization goals cannot be derived in the strict sense of the word because of the lack of empirically formulated laws. Moreover, postulating the implications of ultimate goals is not a process of logical deduction, because the assumption of functional or implicative relationships between subgoals and ultimate goals is required before a logical relationship can be hypothetically construed. Therefore, it is an act of classification rather than one of deduction (Meyer, 1972).

Currently, subgoals can be related to ultimate goals on the basis of developmental laws in only a few cases. The relationship is hypothesized instead by using arguments of plausibility. This can be illustrated, for example, by reference to the first of the aforementioned viewpoints: (a) Neither ecological conditions, nor political organizations, nor occupational requests, nor means and ways of social interaction in a future society can be predicted reliably. (b) Decisions about developmental goals and new behavioral standards in response to changing

socioecological circumstances can be made more easily in the future than today.
(c) No authority (person or institution) can be named that could serve as an orientation mark in the future.

B. LIFE-SPAN DEVELOPMENT AND CHILDHOOD SOCIALIZATION GOALS

Under a life-span perspective, the conclusion to be drawn from these considerations is that individuals themselves will have to make decisions about their own developmental goals throughout their entire lives. Therefore, intervention in childhood must be guided by a primary goal of preparing individuals for the necessities of continuous decision making and planning over the whole life-span. Thus, the development of characteristics which are assumed to hinder autonomous planning and rational decision making (e.g., rigid emotional attitudes or habits, low levels of information processing, uncritical acceptance of authorities, or dependence on interaction partners and on external control), should be prevented. Since little is known about the stability and changeability of these characteristics in adulthood, it appears reasonable to assert that preventing their establishment in childhood is a generally desirable endeavor.

Developmental psychology of the life-span type contributes to the establishment of educational goals in still other ways. The traditional orientation in child development focuses on universal developmental trends during childhood and adolescence and specifies directions that are considered to be "natural" and are often elevated to an "ideal norm" referring to a "natural law" (Hoermann, 1963). Characteristics such as formal-logical reasoning, moral autonomy, cognitive complexity, and genital sexuality are conceived of as natural developmental end points or goals. Descriptive developmental psychology leads to the formulation of age-specific norms (with regard to specific populations or groups) which serve as age-specific developmental goals and are treated as a valid basis for the evaluation of an actual developmental state. The observation and analysis of developmental processes permits the designation of developmental subgoals or intermediate goals by outlining the sequential order of behavioral development and by pointing to various internal prerequisites for further development in different domains. In this sense, a life-span perspective emphasizes that childhood educational goals are only a subset of a series of goals extending throughout the life-span.

While traditional developmental psychologists of childhood and adolescence would probably argue that the developmental end product is achieved at the beginning of adulthood, a life-span developmental approach points to processes which continue to change during adulthood. Such a vantage point challenges cultural "self-evidences" and consensual expectations concerning the changeability of characteristics in adulthood and old age. This viewpoint, by extending the time perspective of development, allows for the formulation and establish-

ment of new developmental "optima" which may or should be accomplished in later years. In many ways, the formulation of developmental goals during adulthood comes closer to clinical-psychological categories such as individuation, self-actualization, self-acceptance, and prevention of disengagement (see, e.g., Brim, 1968; Looft, 1973). In addition, a life-span developmental theory focuses not only on universal trends of change (a perspective which is more characteristic of the traditional child and adolescent developmental approach) but also on individual- and group-specific patterns and rates of change (Neugarten, 1969). This is primarily due to the observation that interindividual differences in behavior show continuous increases with age and development. Finally, life-span theory and research are centered on the dynamic interplay between individual ontogenetic and historical-evolutionary change (e.g., marked cohort effects). The rediscovery of generation or cohort differences and secular change not only allows for the establishment of certain developmental goals for different generations but also points to the possibilities of formulating developmental goals which reduce, maintain, or strengthen generation differences (see, e.g., Birren & Woodruff, 1973; Schaie, 1973).

In brief, the outcome of a discussion of educational goals depends heavily on the point of view about human development. From a life-span perspective the goals for intervention in early childhood might be dramatically different than those adopted from a child development approach. The substantive foci of life-span theory lead to considerations which go beyond the age-specific vantage point of most childhood educators.

III. Design of Intervention Programs

Having discussed possible contributions of life-span developmental psychology to the establishment of educational goals, recommendations for the design of intervention programs and their evaluation from a life-span perspective will be offered.

A. A TAXONOMIC SCHEME

A taxonomic scheme may serve as a guide for planning intervention research and practice. Interventive efforts may be classified according to the following criteria:

1. *Target areas*—persons (socialization agent, "socializee"); settings (institutions, communities)
2. *Procedures*—formal attributes (duration, intensity, frequency, etc.); degree of complexity including the sequential versus nonsequential ordering of techniques

3. *Hypothesized relationships between intervention procedure and target behavior*—unidirectional versus interactional; deterministic versus stochastic

4. *Hypothesized moderating conditions*—characteristics of persons (age, sex, generation, biography, etc.); characteristics of settings (cultural system, ecological variables, etc.)

5. *Aspects of evaluation*—univariate versus multivariate control of effects or side effects; short- versus long-term control of effects or side effects.

Different research programs derived from this taxonomic scheme require different strategies of data gathering and data processing (Buss, 1974).

B. LIFE-SPAN PERSPECTIVES

In planning and evaluating intervention programs under a life-span perspective a number of issues should be considered.

First, a life-span approach programmatically avoids an insular consideration of single segments of life. Thus, introducing antecedent variables through an intervention program in early years implies not only observing their immediate effects but also across the whole life-span. That is, the relative influence of the intervention on consequent variables has to be estimated by repeated measurements at different age levels. By observing a variation in the relationships between the antecedent and consequent variables across the life-span, inferences can be made regarding the importance of such issues as: (a) the age and time when the antecedent variables are introduced; (b) the duration and intensity of the antecedent variables; and (c) interactions between different antecedent variables introduced at different ages.

Secondly, from a life-span perspective the effects of intervention may be seen as a function of the period of time since the initiation of the program. The effects may be immediate or delayed, temporary or permanent, and they may influence the developmental process in terms of level changes or slope changes (Wohlwill, 1973).

Finally, life-span developmental psychology points to the interactions between intervention procedures and certain characteristics of the target person, especially generation and age membership (conceived of as an indicator variable). Intervention strategies cannot be assumed to operate in identical ways on subjects of different developmental levels or historical periods.

IV. Problems in Transforming Empirical Knowledge into Intervention Programs

When seeking empirical knowledge which is applicable to the construction of intervention programs, we hope to be able to rely on some experimental work.

This appears to be possible especially for the area of cognitive and linguistic development. There is also a great deal of research that is concerned with the description of intraindividual change by using cross-sectional, longitudinal, and mixed designs and with the investigation of relationships between early life events or organismic variables and the development of certain characteristics in later years (see, e.g., Bayley, 1964; Kagan & Moss, 1962) by using correlational analyses. The questionable usefulness of developmental data has been clarified by a variety of contributions from life-span research which typically has accentuated some methodological design problems that are easily overlooked if an age-specific view, such as a child developmental one, is applied. For example, with regard to the applicability of empirical findings to the construction of intervention programs, the available experimental and correlational data are of restricted value for a number of reasons, such as the possibility of cohort effects, experimental mortality, practice effects, etc.

A. MATCHING DEVELOPMENTAL THEORY AND DESIGN METHODOLOGY

Developmental psychology has been defined as dealing with the description, explanation, and modification of intraindividual change and interindividual differences in intraindividual change (Baltes, 1973). Much of the child development research, however, does not converge on this ideal. Starting with a discussion of correlational methods, it must be reemphasized that they do not permit the identification of causal (explanatory) relationships.

Since every intervention attempt requires knowledge about the variables that produce change using valid "if-then" statements, our efforts first have to be aimed at the construction of causal models. The existing correlational data in developmental psychology are based on interindividual variation—a fact that is often overlooked. The interventionist is confronted with a severe problem of generalization when he/she attempts to produce intraindividual change in a target attribute by manipulating variables which are correlated with the target attribute on the basis of interindividual differences. Thus, the correlational pattern derived from interindividual variation cannot be assumed to show up when it is calculated from intraindividual variation. Even if high maternal control, for instance, were strongly related to obedience in the child, as inferred from research on interindividual variation, intraindividual variation in maternal behavior (i.e., an increase/decrease in maternal control) may not produce the expected effect—perhaps because of the child's interpretations and causal explanations of the change in maternal behavior (Schneewind, 1974).

Furthermore, the interventionist cannot rely on the assumption that the change (i.e., intraindividual variation) in a target variable can be explained by the same set of predictors as the interindividual variance of the variable can be.

For example, by using hypotheses derived from developmental psychology (e.g., sensitive periods), learning theories (e.g., stabilization of behaviors), and symbolic interactionism (e.g., preserving identity), we can expect varying resistance to change. We do not know, though, whether a modification of the variables having predictive value for interindividual variation will produce analogous intraindividual variation (change). This issue is occasionally discussed under the concept of explanatory discontinuity (Baltes & Schaie, 1973).

Finally, we are not sure whether spontaneous and "manipulated" change in an individual have the same correlates. Even if spontaneous variation (which, for instance, could be explained by the transactional character of the parent-child relationship) were measured and its correlates were defined, the problem of whether the manipulation of such correlates in an intervention program would produce the same effects (i.e., intraindividual change) remains unsolved. The intervention attempt itself may produce side effects (e.g., divergent evaluation of the former and the new educational behavior; inconsistencies between attitudes and behavior), which in turn could modify the assumed covariation in an unknown manner.

It may appear, then, that the applicability of most developmental research to intervention planning is doubtful because: (a) it does not sufficiently focus on the key parameters of developmental research and theory, i.e., the explicit and direct assessment of intraindividual change (Baltes, 1973); and (b) isomorphy and/or homology (Baltes & Goulet, 1971) between experimental laboratory and naturalistic settings cannot easily be assumed. To overcome such methodological shortcomings, it is proposed to emphasize research strategies which are more explicitly related to the intrinsic goals of developmental research than is true for most current work.

B. SOME PROPOSALS ON DESIGN METHODOLOGY

As pointed out in the early 1960s by Zigler (1963) and reemphasized recently by Risley and Wolf (1973), Hoyer (1974), and others, the experimental approach to problems of developmental psychology should be considered whenever possible. This approach would enable us to distinguish more precisely between causes and effects and would yield more information on the factors producing change instead of those merely correlated with change. Since developmental psychologists often lack full control over experimental conditions, however, quasi-experimental designs (Campbell & Stanley, 1963) should be applied more frequently.

Time series studies, for example, would show whether or not an intervention program indeed produced a developmental change (e.g., Campbell, 1969; Wortman, 1975). In case utilization of experimental and quasi-experimental strategies is limited, or nonexperimental designs are preferred (because of their heuristic

value in theory construction), the identification of causal relationships should be stressed, nevertheless, according to methodological models such as those proposed by Blalock (1964) and Coleman (1971), among others. Such models are especially appropriate for the investigation of developmental processes because of the conceptual distinction between direct versus mediated causal relationships or between external versus internal causes of change. Explanatory studies are needed which, from a life-span perspective, are aimed at identifying not only temporally proximal but also temporally distal causes of intraindividual change and which will provide more information about the "when" and "how" of intervention in developmental processes.

Aside from this, the interventionist needs more information on the applicability of group data to single cases. In order to avoid what Hoyer (1974) has called the "paradox of 'discovering' laws of behavioral development that do not generalize to the individual" (p. 824), it may be preferable to use small-sample methodologies or single-subject designs more frequently. When using large-group designs, it is important to examine those subjects who are represented inexactly by the group data obtained and to identify the variables, step by step, which distinguish them from those subjects who more closely fit the data. The systematic investigation of moderator variables that contribute to treatment-by-person interactions will sharpen the interventionist's ability to design the best treatment for each individual.

A last problem to be mentioned here is the control of the possible side effects of any intervention program. To be able to handle our empirical data, it is necessary to confine our design to a limited number of variables, e.g., the complex net of psychological variables must be neglected and an isolated subset of some of them must be chosen in a somewhat arbitrary way. Thus, by observing treatment-produced change in the variables under study, change in other variables not included in the design may be overlooked. For example, according to Barker's (1968) behavior setting theory, an increase in social activities and responsibility (defined as an intervention goal) produced by environmental change may be accompanied by a decrease in freedom of movement and autonomy (defined as an unwanted side effect). In other words, interventions in complex "systems" (persons, institutions, or environments) have multiple effects which can be registered only by successively enlarging the number of variables under study and by trying to approximate the experimental situation to the natural one. Since in the area of long-range processes like psychological development it is impossible to include all relevant variables in any empirical design or construe an isomorphic relationship between experimental and natural conditions, an increase in the use of simulation experiments (see, e.g., Baltes & Goulet, 1971) or computer simulation models (e.g., Harbordt, 1974) is encouraged. Such models have been successfully applied in other research areas.

V. Toward Research in Childhood Intervention from Life-Span Perspectives

The issues raised lead to a number of specific suggestions. For example, from a life-span perspective the interventionist is concerned with long-range and distal effects of the preventive and optimizing types of intervention in childhood—effects which may under certain circumstances occur at later ages. However, a longitudinal tracing of the effects of intervention would require that we wait for decades in order to get a final evaluation of the efficacy of the program (unless estimates of intervention effects are obtained from retrospective reports). In addition, the effects of the program might be generation specific and, thus, would lead to the questionableness of its effectiveness for current and/or future generations.

At this point it should be asked what possibilities are available for an evaluation of long-term effects within a reasonable and practical length of time. What is needed is a short-term estimation of long-term effects and efficiency; this can be accomplished only by reference to a theory of development that covers at least the period between intervention (preventive or optimizing) and the criterion age. Such a theory should include variables in close temporal connection with the intervention point, i.e., variables which may serve as early check marks for the estimation of long-term effects.

The use of growth curves, for instance, provides developmental psychology with one possibility to control for long-term effects. Suppose an intervention program is designed to correct individual deviations from the "ideal": an approximation to a test section of the curve could then be viewed as an indicator for long-term success [see Wohlwill (1970) for a discussion of this approach]. As early childhood intervention on cognitive behavior has shown, the estimation of long-term effects is as valid as the knowledge about conditions and determinants of the ideal developmental curve and its realization for the group under treatment. (The programs actually indicate that a single intervention effort is insufficient to raise the "normal" intelligence level but rather that intervention has to be maintained over time.)

In summary, estimations of distal consequences will become increasingly more reliable (a) the higher the validity of causal hypotheses about intervention effects; (b) the greater the proportion of controlled causal factors; (c) the more accurate and complete the information on growth curves and change trends; (d) the more reliable the anticipation of events which may support or interfere with intervention effects; and (e) the greater the control over side effects of the intervention.

Returning to life-span theory, the lack of proof in such tentative models will often be tremendous. Without an attempt to construct developmental theories which can be validated by combining the available fragmentary information into

a "developmental puzzle," modification programs in childhood education that develop from a life-span perspective involve some element of risk. However, the conceptual proposals appear to be worth both the gamble and the effort.

VI. Concluding Comments

Childhood education derives its rationale not only from knowledge about children and child development but also from views of and knowledge about subsequent periods of the human life-span. Thus, a life-span developmental approach offers programmatic implications concerning the goals and conditions for optimal human development in childhood as well as in later age periods. Even though every concrete empirically grounded suggestion concerning goals for programs in childhood education would require an extremely careful analysis and a cautious and critical use of research data, generic contributions of a life-span perspective can be delineated on a conceptual level.

Concerning the formulation of educational goals, a life-span perspective leads the interventionist to consider developmental tasks and goals characteristic of the adolescent, adult, and older person in the design of childhood education. Furthermore, in contrast to child and adolescent psychology, where universal change trends are stressed, a life-span perspective suggests not only such universal changes but also interactions of ontogenetic with sociohistorical changes in which both individual and group-specific goals and modes of man-environment interaction are emphasized. Such a vantage point focuses on diversity and multidirectionality of goal systems and sequences.

As far as intervention procedures are concerned, it must be stated that educational strategies under a life-span approach cannot be assumed to operate in identical ways for subjects who are at different developmental levels. Moreover, intervention effects are not static or time specific, but rather they involve long-term, distal side effects. The nature of such intervention effects in childhood education requires a life-span approach to program planning and evaluation. A life-span point of view, then, provides us with information aimed at minimizing any long-term negative transfer effects from a childhood to an adult and/or gerontological educational program.

Special emphasis is also directed to the discussion of some problems inherent in the application of research data to the planning and development of intervention programs; this discussion applies to any intervention effort, whether designed from a child or a life-span developmental perspective. Childhood education efforts should be based on research of the direct and valid assessment of intraindividual change and the associated antecedent conditions, rather than on developmental research conducted using individual differences methodologies. Furthermore, the research strategies utilized should be ones which

permit a definite identification of causal factors in intraindividual change. An attempt must also be made to construct developmental theories to provide early check marks for long-term effects. A final observation proposes to relate the available data (normative, correlational, experimental, quasi-experimental, etc.) in putting together "developmental puzzles," even if they remain for the most part fragmentary. Such efforts will provide the most valid recommendations that are possible for educationally guided development.

It is concluded that a life-span perspective can be helpful in clarifying and accentuating a series of issues which need explicit consideration in the planning and evaluation of early educational efforts. In fact, the issues raised by a life-span view are easily overlooked if an age-specific approach is applied to childhood education, as is favored in most current models used in childhood education.

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