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Relative Plasticity, Integration, Temporality, and Diversity in Human Development: A Developmental Contextual Perspective About Theory, Process, and Method

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Current research about adolescent development often is associated with ideas stressing that dynamic individual–context relations provide the bases of behavior and developmental change. The power of these ideas is constituted by 4 assumptive components of contemporary developmental theories: systematic change and relative plasticity; relationism and integration; embeddedness and temporality; and generalizability limits, diversity, and individual differences. A program of research adequate to address these ideas must involve longitudinal designs and diversity- and change-sensitive measures, multiple methods to appraise variables at multiple levels, and multiple cohorts to assess temporal change. Such theory-guided research may legitimate the possibility of enacting policies and programs to promote positive developmental trajectories in children and adolescents and thus capitalize on the human potential for plasticity.

Adolescents and their families, communities, and societies develop; they show systematic and successive changes over time (Lerner, 1986). These changes are interdependent. Changes within one level of organization, for example, developmental changes in personality or cognition within the individual, are reciprocally related to developmental changes within other levels, for example, changes in caregiving patterns or spousal relationships within the familial level of organization (e.g., Hetherington, Lerner, & Perlmutter, 1988; Lerner & Spanier, 1978; Lewis & Rosenblum, 1974).

Moreover, the reciprocal changes among levels of organization are both products and producers of the reciprocal changes within levels. For example, over time, parents' "styles" of behavior and of rearing influence children's personality and cognitive functioning and development; in turn, the interactions between personality and cognition constitute an emergent "characteristic" of human individuality that affects parental behaviors and styles and the quality of family life (e.g., Lerner, 1982; Lerner & Busch-Rossnagel, 1981; Lerner, Castellino, Terry, Villarruel, & McKinney, 1995; Lewis, in press).

These interrelations illustrate the integration of changes within and among the multiple levels of organization constituting the ecology of human life (Bronfenbrenner, 1979; Lerner, 1978, 1984, 1991). Human development within this ecology involves organized and successive changes—that is, systematic changes—in the structure and function of interlevel relations over time (Ford & Lerner, 1992). In other words, the human development system involves the integration, or "fusion" (Tobach & Greenberg, 1984), of changing relations among the multiple levels of organization that compose the ecology of human behavior and development. These levels range from biology through culture and history (Bronfenbrenner, 1979; Elder, 1980; Gottlieb, 1992; Riegel, 1975). Indeed, the embeddedness of all levels of the system within history provides a temporal component to human development (Elder, Modell, & Parke, 1993); makes the potential for change a defining feature of human development (Baltes, 1987); and as such assures that relative plasticity (i.e., the potential for systematic change across ontogeny) characterizes development across the human life span (Lerner, 1984).

Given that human development is the outcome of changes in this developmental system, then, for individual ontogeny, the essential process of development involves changing *relations* between the developing person and his or her changing context (Lerner, 1991). Similarly, for any unit of analysis with the system (e.g., for the family, studied over its life cycle; Lerner & Spanier, 1978; or for the classroom, studied over the course of a school year; J. V. Lerner & Lerner, 1983), the same developmental process exists. That is, development involves changing relations between that unit and variables from the other levels of organization within the human development system. Accordingly, the concept of development is a relational one: Development is a concept denoting systemic changes—that is, organized, successive, multilevel, and integrated changes—across the course of life of an individual (or other unit of analysis).

I believe that a focus on process and, particularly, on the process involved in the changing relations between individuals and their contexts, is at the cutting edge of contemporary developmental theory and, as such, is the predominant conceptual frame for research in the study of human development (Lerner, in press). Certainly, these theoretical and empirical orientations represent the essential approaches of the preponderant majority of the research articles in this special issue. Indeed, the forefront of contemporary developmental theory and research is represented by theories of process: of how structures function and how functions are structured over time (Lerner, in press).

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For example, and as reflected by the articles in this special issue, most contemporary research about human development in general, and about adolescent development more specifically, is associated with theoretical ideas stressing that the dynamics of individual–context relations provide the bases of behavior and developmental change (see too Lerner, 1986, in press; Lerner, Petersen, & Brooks-Gunn, 1991). Indeed, even models that try to separate biological or, more particularly, genetic influences on an individual's development from contextual ones are at pains to (retro)fit their approach into a more dynamic systems perspective (e.g., as found in Ford & Lerner, 1992; Gottlieb, 1992; Thelen & Smith, 1994; Wapner, 1993).

For instance, in the concluding paragraph of their article on the association between (a) autonomic conditioning and electrodermal recovery time and (b) criminal behavior, Raine, Venables, and Williams (1996) noted that "it is always possible that social factors not indexed in this study could underlie group differences in psychophysiological variables. It is not inconceivable, for example, that early environmental factors such as stressful life events or child abuse could alter psychophysiological functioning" (p. 629). In turn, Pike, McGuire, Hetherington, Reiss, and Plomin (1996) argued that "The presence of genetic influence on measures of the family environment is consistent with the idea that socialization is bidirectional. That is, when parents interact with their children, this interaction is affected by the child's behavior as well as that of the parent" (p. 591).

Thus, in emphasizing that systematic and successive change (i.e., development) is associated with alterations in the dynamic relations among structures from multiple levels of organization, the scope of contemporary developmental theory and research is not limited by (or, perhaps better, confounded by an inextricable association with) a unidimensional portrayal of the developing person (e.g., the person seen from the vantage point of only cognitions, or emotions, or stimulus–response connections, or genetic imperatives; e.g., see Piaget, 1970; Freud, 1949; Bijou & Baer, 1961; Rowe, 1994, respectively). Rather, the power of the contemporary stress on processes of dynamic person–context relations is the "design criteria" imposed on research, method, and application pertinent to the study of any content area or dimension of the developing person. This power is constituted by four interrelated, and in fact "fused" (Tobach & Greenberg, 1984), assumptive components of contemporary theories of human development (Lerner, in press). Accordingly, it is useful to discuss these components to illuminate the key theoretical and methodological (e.g., research design and measurement) issues pertinent to understanding how biological, psychological, and contextual processes combine to promote behavior and development across the life span and, certainly as well, within periods such as adolescence.

Change and Relative Plasticity

Contemporary theories stress that the focus of developmental understanding must be on systematic *change* (Ford & Lerner, 1992). This focus is required because of the belief that the potential for change exists across the life span (e.g., Baltes, 1987). Although it is also assumed that systemic change is not limitless (e.g., it is constrained by both past developments and by contemporary contextual conditions), contemporary theories stress that *relative plasticity* exists across life (Lerner, 1984).

There are important implications of relative plasticity for the application of development science. For instance, the presence of relative plasticity legitimates a proactive search across the life span for characteristics of people and of their contexts that, together, can influence the design of policies and programs promoting positive development (Birkel, Lerner, & Smyer, 1989; Fisher & Lerner, 1994; Lerner & Hood, 1986).

Relationism and the Integration of Levels of Organization

Contemporary theories stress that the bases for change, and for both plasticity and constraints in development, lie in the relations that exist among the multiple levels of organization that make up the substance of human life (Ford & Lerner, 1992; Schneirla, 1957; Tobach, 1981). These levels range from the inner biological level, through the individual and psychological level and the proximal social relational level (e.g., involving dyads, peer groups, and nuclear families) to the sociocultural level (including key macroinstitutions such as educational, public policy, governmental, and economic systems) and the natural and designed physical ecologies of human development (Bronfenbrenner, 1979; Riegel, 1975). These levels are structurally and functionally integrated, thus requiring a systems view of the levels involved in human development (Ford & Lerner, 1992; Sameroff, 1983; Thelen & Smith, 1994).

Developmental contextualism (Lerner, 1986, 1991, 1995) is one instance of such a developmental systems perspective. Developmental contextualism promotes a *relational* unit of analysis as a requisite for developmental analysis (Lerner, 1991): Variables associated with any level of organization exist (are structured) in relation to variables from other levels; the qualitative and quantitative dimensions of the function of any variable are shaped as well by the relations that variable has with variables from other levels. Unilevel units of analysis (or the components of, or elements in, a relation) are not an adequate target of developmental analysis; rather, the relation itself—the interlevel linkage—should be the focus of such analysis (Lerner, 1991; Riegel, 1975).

Relationism and integration have a clear implication for unilevel theories of development: At best, such theories are severely limited and inevitably provide a nonveridical depiction of development, because of their focus on what are essentially main effects embedded in higher order interactions (e.g., see Walsten, 1990); at worst, such theories are neither valid nor useful. Accordingly, neither biogenic theories (e.g., genetic reductionistic conceptions such as behavioral genetics or sociobiology; Freedman, 1979; Rowe, 1994), psychogenic theories (e.g., behavioristic or functional analysis models; Bijou, 1976; Bijou & Baer, 1961), nor sociogenic theories (e.g., "social mold" conceptions of socialization; e.g., Homans, 1961; and see Hartup, 1978, for a review) provide adequate theoretical frames for understanding human development. Simply, neither nature nor nurture theories provide adequate conceptualizations of human development (cf. Hirsch, 1970). For instance, theories that stress critical periods of development (e.g., Bowlby, 1969; Erikson, 1959; Lorenz, 1965), that is, periods of ontogeny constrained by bi-

ology (e.g., by genetics or by maturation), are seen from the perspective of theories that stress relationism and integration as conceptually flawed (and empirically counterfactual).

Moreover, many nature–nurture interaction theories also fall short in this regard; theories of this type often treat nature and nurture variables as separable entities and view their connection in manners analogous to the interaction term in an analysis of variance (e.g., Bijou, 1976; Erikson, 1959; Rowe, 1994; cf. Gollin, 1981; Hebb, 1970; Walsten, 1990). The cutting edge of contemporary theory moves beyond the simplistic division of sources of development into nature-related and nurture-related variables or processes; instead the multiple levels of organization that exist within the ecology of human development are seen as part of an inextricably fused developmental system.

Historical Embeddedness and Temporality

The relational units of analysis of concern in contemporary theories are understood as change units (Lerner, 1991). The change component of these units derives from the ideas that all of the above-noted levels of organization involved in human development are embedded in history, that is, they are integrated with historical change (Elder, 1980; Elder et al., 1993). Relationism and integration mean that no level of organization functions as a consequence of its own, isolated activity (Tobach, 1981). Each level functions as a consequence of its fusion (its structural integration) with other levels (Tobach & Greenberg, 1984). History—change over time—is incessant and continuous, and it is a level of organization that is fused with all other levels. This linkage means that change is a necessary and an inevitable feature of variables from all levels of organization (Baltes, 1987; Lerner, 1984); in addition, this linkage means that the structure, as well as the function, of variables changes over time.

Indeed, at the biological level of organization, one prime set of structural changes across history is subsumed under the concept of evolution (Gould, 1977; Lewontin, 1981; Lewontin, Rose, & Kamin, 1984); of course, the concept of evolution can be applied also to functional changes (Darwin, 1872; Gottlieb, 1992). In turn, at more macrolevels of organization many of the historically linked changes in social and cultural institutions or products are evaluated in the context of discussions of the concept of progress (Nisbet, 1980). The continuity of change that constitutes history can lead to both intraindividual (or, more generally, intralevel) continuity or discontinuity in development, depending on the rate, scope, and particular substantive component of the developmental system at which change is measured (Brim & Kagan, 1980; Lerner, 1986, 1988; Lerner & Tubman, 1989). Thus, continuity at one level of analysis may be coupled with discontinuity at another level; quantitative continuity or discontinuity may be coupled with qualitative continuity or discontinuity within and and across levels; and continuity or discontinuity can exist in regard to both the processes involved in (or the "explanations" of) developmental change and in the features, depictions, or outcomes (i.e., the "descriptions") of these processes (Cairns & Hood, 1983; Lerner, 1986).

These patterns of within-person change pertinent to continuity and discontinuity can result in either constancy or variation in the rates at which different individuals develop in regard to a particular substantive domain of development. Thus, any pattern of intraindividual change can be combined with any instance of interindividual differences in within-person change, that is, with any pattern of stability or instability (Lerner, 1986; Lerner & Tubman, 1989). In other words, continuity–discontinuity is a dimension of intraindividual change and is distinct from, and independent of, stability–instability, which involves between-persons change and is, therefore, a group and not an individual concept (Baltes & Nesselroade, 1973; Lerner, 1986).

In summary, because historical change is continuous, temporality is infused in all levels of organization. This infusion may be associated with different patterns of continuity and discontinuity across people. The potential array of such patterns has implications for understanding the importance of human diversity.

The Limits of Generalizability, Diversity, and Individual Differences

The temporality of the changing relations among levels of organization means that changes that are seen within one historical period (or time of measurement) and/or with one set of instances of variables from the multiple levels of the ecology of human development may not be seen at other points in time (Baltes, Reese, & Nesselroade, 1977; Bronfenbrenner, 1979). What is seen in one data set may be only an instance of what does or what could exist. Accordingly, contemporary theories focus on diversity—of people, of relations, of settings, and of times of measurement (Lerner, 1991, 1995).

Individual differences within and across all levels of organization are seen as having core, substantive significance in the understanding of human development (Baltes, 1987; Lerner, 1991, 1995). Diversity is the exemplary illustration of the presence of relative plasticity in human development (Lerner, 1984). Diversity is also the best evidence that exists of the potential for change in the states and conditions of human life (Brim & Kagan, 1980).

Moreover, the individual structural and functional characteristics of a person constitute an important source of his or her development (Lerner, 1982; Lerner & Busch-Rossnagel, 1981). The individuality of each person promotes variation in the fusions he or she has with the levels of organization within which the person is embedded. For instance, the distinct actions or physical features of a person promote differential actions (or reactions) in others toward him or her (Lerner, 1987). These differential actions, which constitute feedback to the person, shape at least in part further change in the person's characteristics of individuality (Schneirla, 1957; Lerner & Lerner, 1989). For example, the changing match, congruence, or goodness of fit between the developmental characteristics of the person and of his or her context provide a basis for consonance or dissonance in the ecological milieu of the person; the dynamic nature of this interaction constitutes a source of variation in positive and negative outcomes of developmental change (J. V. Lerner & Lerner, 1983; Thomas & Chess, 1977).

The major assumptive components of contemporary theories of human development—systematic change and relative plasticity, relationism and integration, embeddedness and tempo-

rality, and generalizability limits and diversity—are very much intertwined facets of a common paradigmatic core. And, as also the case with the levels of organization that are integrated to form the substance of developmental change, the assumptive components form the corpus of superordinate developmental systems views of human development (Ford & Lerner, 1992), for example, developmental contextualism. As is the case with the several defining features of the life span developmental perspective, which, accordingly to Baltes (1987), need to be considered as an integrated whole, the assumptive components of contemporary developmental theories need to be appreciated simultaneously. Such appreciation is required to understand the breadth, scope, and implications for research and application of this "family" of conceptual frameworks.

Methodological Implications

The temporality involved in contemporary theories of human development necessitates change-sensitive measures of structure and function *and* change-sensitive (i.e., longitudinal) designs (Baltes et al., 1977; Brim & Kagan, 1980). The key question vis-à-vis temporality in such research is not whether change occurs; rather, the question is whether the changes that do occur make a difference for a given developmental outcome (Lerner, Skinner, & Sorell, 1980).

Moreover, given that the study of these changes will involve appraisal of both quantitative and qualitative features of change, which may occur at multiple levels of organization, there is a need to use both quantitative and qualitative data collection and analysis methods, ones associated with the range of disciplines having specialized expertise at the multiple levels of organization at which either quantitative or qualitative change can occur. In essence, then, the concepts of historical embeddedness and temporality indicate that a program of developmental research adequate to address the relational, integrated, embedded, and temporal changes involved in human life must involve multiple occasions, methods, levels, variables, and cohorts (Baltes, 1987; Lerner, 1986, 1991; Schaie, 1965).

Thus, the theoretically provocative and substantively important empirical patterns of unitemporal covariation between adolescent functioning and contextual characteristics that are represented in several of the articles in this special issue would be critical to enrich by longitudinal extension. Empirical appraisals of cross-time variation and covariation are more veridical with the character of change phenomena. Moreover, such analyses would afford examination of whether changes are consistent with theoretical propositions about developmental processes. In other words, to study any process and, more basically, to study any change phenomenon, cross-temporal (multioccasion) data must be gathered, and it would be both theoretically interesting and important and empirically useful to recast the cross-sectional data sets in this special issue as longitudinal investigations.

Indeed, change-sensitive (i.e., longitudinal) designs must be used in research that is intended to adequately appraise the alterations over time that are associated with individual behavior across the adolescent period (e.g., Lerner et al., 1991). As noted, these designs must involve the use of measures that are developed to be able to detect change; however, it is typically the case that measures of traits are not developed to be sensitive to developmental change (Lerner, 1988, 1991). Furthermore, multivariate measurement models must be used to appraise the several individual and contextual levels integrated within and across the adolescent period.

However, a dynamic systems theory, such as development contextualism, would move the study of adolescent development beyond just the point of promoting multivariate-longitudinal designs involving change-sensitive measures. In addition, developmental contextualism would lead scholars to design research studies that involve the following: (a) dynamic (fused) relations among levels of organization (Ford & Lerner, 1992; Tobach & Greenberg, 1984) involved in the ecology of human development; (b) the appraisal of levels ranging from the inner-biological, and individual-psychological, to the physical ecological, the sociocultural, and the historical; and here, concepts that stress the ways in which levels interrelate, or are fused—such as the goodness-of-fit notion forwarded by J. V. Lerner and Lerner (1983)—may be particularly helpful; (c) the individual differences (the diversity) that derives from variation (e.g., in the timing) of the interactions among levels; and, because researchers may not be expert in the culture and ecology of all the diverse groups of youth they study; and (d) as necessary, a "co-learning" model for the design of research (and intervention) programs (Birkel et al., 1989; Lerner, 1995); this model relies on the contributions of youths themselves to further knowledge about the issues, assets, and risks affecting their lives. Such research thus diminishes problems of "alienation" between researchers and participants (Riegel, 1975) and suggests that any quantitative appraisal of adolescents rests on a qualitative understanding of their life spaces and meaning systems. Because such understanding is shaped at least in part by the participants' input, research and, especially, programs derived from such information are more likely to be valued and "owned" by, and therefore efficacious in influencing the lives of, young people (Lerner, 1995).

Finally, then, developmental contextualism underscores the need for policies and programs that are derived from research to be diversity-sensitive and to take a change-oriented, multilevel, integrated, and hence a developmental systems approach (Ford & Lerner, 1992), to capitalize on the potential for plasticity present in the human development system. The integrated nature of this system means that one can effect change by entering the system at any one of several levels, or at several levels simultaneously, depending on the precise circumstances within which one is working and on the availability of multidisciplinary and multiprofessional resources (Lerner, 1995).

Conclusion

Contemporary theories of development and the research associated with them take an integrative approach to the multiple levels of organization presumed to constitute the nature of human life; that is, "fused" (Tobach & Greenberg, 1984) relations among biological, psychological, and social and physical contextual levels constitute the process of developmental change in human life. Rather than approach variables from these levels of analysis in either a reductionistic or a parallel-processing approach, theories, such as developmental contextu-

alism (Lerner, 1986, 1991, 1995), rest on the idea that variables from these levels of analysis are dynamically interactive—they are reciprocally influential over the course of human ontogeny.

It is such ideas that shape much of the empirical work presented in this special issue, especially those instances that reflect longitudinal, change-sensitive, multilevel integrated, and dynamic approaches to the study of adolescent–context relations. Only through such research will adequate understanding be developed of the bases and import of the multiple pathways that compose the adolescent period.

In turn, not only do theoretical views such as developmental contextualism provide an agenda for a developmental, dynamic, and systems approach to research about adolescent development, but they also allow researchers to envision the possibility of promoting positive developmental trajectories in adolescents (Lerner, 1995). One may actualize this vision if one remains assiduously committed to a developmental systems orientation; if one recognizes the "double-edged sword" nature of plasticity that derives from the functioning of this system; and if one therefore creates through policies and programs a "convoy of social support" (Kahn & Antonucci, 1980) across the life course of adolescents. Such a convoy would be a network encompassing the familial, community, institutional, and cultural components of the ecology that affects a person's behavior and development across his or her life.

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