San Jose State University Interlibrary Services

ILLiad TN: 203996

Call #: BF712.5 .S73 1992

Borrower: OSO
Borrower's TN: 69361.0

Location: King 6th Floor CHECK SHELVES

Lending String: ORE,ORE,LSH,*CSJ,UPP

Patron: Greene, Teresa

Journal Title: Stability and change in development ; a study of methodological reasoning /

Maxcost: 20.00IFM

Volume: Issue:
Month/Year: 1992
Pages: 155-206

Charge:
☐ IFM
☐ Invoice to follow at month's end

Article Author:

Article Title: Kindermann, Thomas A; Skinner, Ellen A.; Modeling environmental development; Individual and contextual trajectories

Imprint: Newbury Park ; Sage, c1992.

ILL Number: 28630496

3/9/2007 03:25:18 PM

PROBLEM REPORT

If you have experienced a problem with the delivery of the requested item, please contact us with the following information. Send back this form via fax or Ariel.

San Jose State University
Interlibrary Services
One Washington Square
San Jose, CA 95192-0028

FAX: (408) 808-2077
ARIEL: 130.65.109.147

_____ Pages were missing pp. _____ to _____

_____ Edges were cut off pp. _____ to _____

_____ Illegible copy – please resend entire item

_____ Incorrect article sent

_____ Not received

_____ Other (please explain)

Jr. (Eds.), *Life-span development and behavior* (Vol. 3, pp. 65-102). New York: Academic Press.

Emmerich, W. (1964). Continuity and stability in early social development. *Child development, 35,* 311-332.

Nesselroade, J. R. (1983). Temporal selection and factor invariance in the study of development and change. In P. B. Baltes & O. G. Brim, Jr. (Eds.), *Life-span development and behavior* (Vol. 5, pp. 59-87). New York: Academic Press.

Nesselroade, J. R. (1988). Some implications of the trait-state distinction for the study of development over the life-span: The case of personality. In P. B. Baltes, D. F. Featherman, & R. M. Lerner (Eds.), *Life-span development and behavior* (Vol. 8, pp. 163-189). Hillsdale, NJ: Lawrence Erlbaum.

Nesselroade, J. R., Pruchno, R., & Jacobs, A. (1986). Reliability versus stability in the measurement of psychological states: An illustration with anxiety measures. *Psychologische Beiträege, 28,* 255-264.

Neter, J., Wasserman, W., & Kutner, M. H. (1990). *Applied linear statistical models* (3rd ed.), Homewood, IL: Irwin.

Schmidt, H. D. (1977). Methodologische Probleme der entwicklungspsychologischen Forschung [Methodological problems of developmental research]. *Probleme und Ergebnisse der Psychologie, 62,* 5-27.

von Eye, A. (Ed.) (1990a). *Statistical methods in longitudinal research: Vol. 1. Principles and structuring change.* San Diego, CA: Academic Press.

von Eye, A. (Ed.) (1990b). *Statistical methods in longitudinal research: Vol. 2. Time Series and longitudinal data.* San Diego, CA: Academic Press.

6

Modeling Environmental Development: Individual and Contextual Trajectories

THOMAS A. KINDERMANN

ELLEN A. SKINNER

It is almost impossible to find a developmental psychologist today who would argue against a contextualized understanding of individual development. Development is widely viewed as a joint function of organismic and environmental forces and as proceeding within a frame of organizing contexts. Nevertheless, there is considerable variation in the specifics of models constructed to conceptualize the nature and characteristics of those contexts that are assumed to be influential for individual development (Bronfenbrenner, 1989; Bronfenbrenner & Crouter, 1983; Wohlwill, 1983). One feature almost all of them share, however, is that they rarely include the notion that environments, like individuals, themselves develop.

This chapter explores the idea that the explanation of individual development is closely tied to an understanding of how contexts change across time. Predicated on the assumptions that individual trajectories are the targets to be explained, that individuals and environments

influence each other reciprocally, that multiple and changing processes of influence are the rule, and that these processes construct both normative and differential change and stability, we propose three models of environmental development. We try to specify the methodological implications of each model and provide empirical examples of how each model can be used in research. These models are built on current conceptualizations of kinds and levels of contexts, and so we begin this chapter with a selective overview of current models of context in psychology.

CONTEXTUAL MODELS IN THE STUDY OF HUMAN DEVELOPMENT

Because an exhaustive discussion of models of context is beyond the scope of this chapter (but see Bronfenbrenner, 1989; Bronfenbrenner & Crouter, 1983; Sameroff, 1983), we will focus on four recent *changes* in conceptions of contexts in the developmental disciplines: (1) a shift in focus from monolithic conceptions to a consideration of multiple dimensions and levels of contextual influences on individuals; (2) a move from descriptive to more explanatory models of context; (3) an increasing "agent-ization" of the social and material context, including for example the recognition that contexts largely consist of other individuals who may have their own agendas; and (4) renewed interest in the dynamics of reciprocal shaping between individuals and environments. All of these emerging features are important elements in the present models of environmental development.

Multiple Dimensions and Levels

In an extensive overview, Bronfenbrenner and Crouter (1983) present a taxonomy of environmental models in developmental psychology (see also Bronfenbrenner, 1989). In their view, contextual models can be classified according to the level of complexity or the number of factors that are included in theory and research on environmental influences. Four kinds of contextual systems are proposed. In the study of contexts as *microsystems*, environmental influences are examined within single settings or across ecological (setting) transitions. The study of *mesosystems*, composed of systems of microsettings, involves ascertaining the relations between different

developmental settings a person is affiliated with at a certain point in time. With even higher complexity, the *exosystem* contains microsystems, mesosystems, and larger social structures that influence the characteristics of lower level systems and individuals. In studying exosystems, linkages and processes between two or more settings are examined. At least one of these settings does not ordinarily contain the developing person, but is the stage for events that influence processes within the immediate setting of the developing person. Finally, *macrosystems* describe the structure of society at large, in terms of values, norms, and political systems.

Historically, Bronfenbrenner and Crouter (1983; Bronfenbrenner, 1989) depict the evolution of contextual models in multiple disciplines as well as in developmental psychology as a progression in the complexity. Concomitant features of this process were, for example, the advent of multifactorial theories and methods of data analysis, and an emerging appreciation for variables of social structure. The recognition of multiple levels of contextual influences has led psychologists to reach out to such disciplines as sociology and history for help in conceptualizing institutions and social systems.[1] According to such models, a full consideration of contextual influences requires teams of multidisciplinary researchers. One remaining issue that our models will attempt to address is how the multiple levels of contextual influences can be focused and coordinated, in order to produce manageable programs of research.

From Description to Explanation

Bronfenbrenner and Crouter (1983) describe the evolutionary process in the development of context understanding as a branching-off process of conceptions from basically two ancestors: the model of social addresses and the nature-nurture model. Based on these, more theory-based models first emerged, focusing on the effects of social structure on individual development. From these again, more recent conceptions are beginning to focus on questions about the specific processes by which environments and individuals reciprocally influence each other.

The recent interest in explanatory models of environments (see also Scarr's 1985 discussion of the use of proximal, behavioral, versus distal, background variables) is not restricted to developmental psychology.

In the domain of sociology, an approach has been proposed by Dannefer (in press) to distinguish models of contexts with regard to their relevance for developmental processes. Dannefer criticizes traditional conceptions of contexts for their lack of theoretical grounding, resulting in depictions of the environment as an "amorphous, haphazard, and unpredictable set of circumstances" (p. 14). In his view, environments need to be distinguished with regard to the influences they exert on individual development. This would entail differentiating among models in which context is assumed to be irrelevant for producing or explaining developmental outcomes; in which context is viewed as presumably important for developmental outcomes, but has random effects; in which contexts are static themselves, but lead to orderly developmental effects in individuals; and finally models in which contexts are understood as comprising an active system of social relations, in which individual development is an outcome.

This progression from the use of descriptive markers toward the inclusion of explanatory hypotheses in the understanding of environments may be characterized as a process of moving beyond a focus on classifications of contexts as "unitary" and "monolithic entities" (Wohlwill, 1983) toward increasingly more theory-based and multifaceted conceptualizations. This pertains to all levels of complexity of context conceptualizations. New questions focus on the exact components of contexts that are relevant for development at different points in time, the processes that might be involved in context-individual and individual-context transmissions, and the specifics of what contexts and individuals actually "do to each other." The concern with explanations of the processes of individual-environment interchanges across time will be the focus of the present chapter.

Agent-ization

At first glance, the question of what environments and people "do to each other" seems to be crucial with regard to social environments only. There is, however, similar concern growing with respect to the influence of physical contexts. Researchers have been increasingly dissatisfied with conceptualizations of the environment that simply reference the presence or absence of specific features or objects; Wohlwill (1983) criticizes them as "passive exposure" conceptions (p. 113). These "monolithic" feature models have given way to theoretical

and empirical attention to the *processes* by which physical contexts exert influence on individuals' behavior and development (for examples, see Green, Gustafson, & West, 1980; Gustafson, 1984; Valsiner, 1984; Valsiner & Mackie, 1985; Yarrow, Rubenstein, & Pedersen, 1975).

Overall, increasing attention has been paid to the psychologically relevant characteristics and functions that contexts possess in contributing to individual change across time. This includes efforts to recognize the "psychological structure" of environments (cf. Sameroff, 1983), the "affordances" that environments provide for individuals' actions (Gibson, 1982), and the mechanisms by which environments influence psychological development (cf. Wohlwill, 1983).

This trend toward agent-ization or personalization has many consequences for the conceptualization of environmental functions. Social contexts are becoming recognized as created by or consisting largely of persons themselves, of persons who have personality characteristics, belief systems, and behavior tendencies. This can be seen in microsystems, where people in interactions are assumed to serve as contexts for each other (Laboratory of Comparative Human Cognition, 1983), or in contexts of higher complexity (Bronfenbrenner, 1989), where modes of context-individual transmission are assumed to be less direct. Again, we will build on this trend of analyzing the "psychological features" of the environment.

Reciprocal Context-Individual Influences

Finally, recent developments in conceptualizations of contexts have pointed out the role of individuals as "active agents" who participate in their own development within contexts. The influences that environments exert on individuals are assumed to feed back into the environment and to influence further environmental change; influences that individuals exert on their contexts are expected to feed back into the pathway of individual development. Through processes of selection, initiation, avoidance, interaction, selective perception, and interpretation, contexts are influenced by the individuals who reside within them (R. M. Lerner & Busch-Rossnagel, 1981; Wohlwill, 1983). Although environments are typically treated as independent variables, the outcomes of which are observed in the change of individuals, increasingly, individuals and contexts are viewed as parts of

dynamic systems, which reciprocally influence each other.[1] This is one assumption that is common to the models for contextual development described in this chapter.

In sum, we are encouraged by new models of context that focus on multiple levels of environmental influences, that move from description toward explanation of individual development, that assume that contexts have many "psychological" features of their own, and that view context-individual influences as dynamic and reciprocal. Building on such conceptions, we hope to contribute a serious consideration of development or systematic change to emerging models of context. We also attempt to examine the usefulness of our models of environmental development in planning programs of empirical research.

BASIC REQUIREMENTS FOR DEVELOPMENTAL MODELS OF THE PSYCHOLOGICAL ENVIRONMENT

A thorough consideration of models of environmental development rests squarely on a description of the psychological target to be explained. We focus on three crucial features of target phenomena in developmental research. First, we argue that conceptualizations of the contextual aspects that should be studied depend on the *target psychological phenomenon* under study. For example, different aspects of the very same physical context may be examined, depending on whether changes in an individual's emotions, cognitions, behaviors, or motivations are of interest. Second, consistent with a life-span perspective on human development, we assume that the "dependent variables" in developmental research are *intra-individual trajectories* and inter-individual differences in such trajectories (P. B. Baltes, Reese, & Nesselroade, 1977). Third, we argue that a *developmental frame* or window is needed to identify those points in time during which a target phenomenon should be open to the influence of environmental factors. What are the implications of this position for views of the developing context?

Specification

The first, and simplest, implication is that the dimensions, components, and levels of the environment that are of interest will vary

depending on the target phenomenon. In general, this means that any theory that attempts to outline *the* dimensions of a context, such as the dimensions of parenting behavior, will be of only limited use. Such a theory provides a menu of choices; however, researchers will use theories about the causal antecedents of their target phenomenon in selecting among potential dimensions.

Two examples may illustrate this point. Recent reviews of research on the consequences of critical life events have attempted to identify the dimensions upon which such events can differ, for example, their severity and age-normative prevalence (e.g., Brim & Ryff, 1980; Reese & Smyer, 1983). These reviews are very useful for pointing out the variety of dimensions underlying nonnormative life events. No conclusions can be drawn, however, about which of these contextual elements are the most important. This depends completely on the target phenomenon: Those dimensions critical in predicting development of coping, for example, might be totally different from those that explain subsequent personality development. A second example can be taken from the research on parenting. Discussions of whether the critical dimensions of parenting are warmth, control, permissiveness, or structure are bound to be inconclusive. The dimensions that are "critical" will depend on the child outcome; for example, the parent behaviors contributing to children's perceived competence will be different from those contributing to their behavioral compliance.

Hence, decisions about the proximal (microsystem) dimensions of context to study will depend on explanatory theories about the antecedents of the target phenomenon of interest. In turn, all subsequent decisions about higher levels of complexity will build on these decisions: The particular dimensions or components at the mesosystem level will be those theorized to influence the microsystem components. For example, in the study of the development of children's intrinsic motivation, several dimensions of teacher behavior have been found to be influential. Specifically, student intrinsic motivation remains stable (as opposed to decreasing across time) in classrooms in which teachers provide more choice and latitude in selection of learning activities, explain the relevance of the activities to children's goals, and do not try to control or coerce children through threats, sanctions, or rewards (Deci & Ryan, 1985). In studying the origins of such teacher behavior, typical measures of classroom structure, teacher beliefs, student behavior, or teacher-parent relationships will not be useful unless researchers have identified which of these

antecedents should predict relevant aspects of teacher behavior. For example, there probably exist hundreds of dimensions of teacher expectations or parent-teacher relationships that do not (and theoretically, should not be expected to) predict teachers' autonomy-supportive behaviors. Using explanatory theories of the target phenomenon in order to identify proximal antecedent dimensions of the context, and then using (or constructing) explanatory theories of these proximal dimensions in order to identify more distal antecedent dimensions, researchers can include the potentially most powerful predictors of the target phenomenon from several levels of contextual complexity in a single study.

When one gives an "anchoring" role to the target developmental trajectory, then the decision about which individuals (or characteristics) to study as target subjects and which individuals (or characteristics) to study as contextual elements may result in entirely different research programs. For example, when studies show that parental sensitivity predicts subsequent child attachment better than earlier child attachment predicts later parental sensitivity, such studies are clearly testing theories in which children are the target individuals and the target to be explained is child attachment. These studies would not be fair tests of the potential child antecedents of parental sensitivity. If parental sensitivity were the target phenomenon, then a different set of child antecedents would be needed. The inclusion of infant characteristics that were theoretically linked to sensitivity, such as clarity of signals and soothability, would allow a more thorough examination of reciprocal parent-child influences in this area.

Developmental Trajectories and
Interindividual Differences Therein

The second implication follows from the assumption that the target phenomena to be explained are developmental trajectories and interindividual differences in these trajectories. In empirical terms, this means that the dependent outcomes are not, as traditionally assumed, a distribution of scores at Time *n*. Instead, the target variable can be either a single growth function, described by a particular intercept and shape, or a set of these functions. Hence, interindividual differences at any point in time have to be regarded as the endpoints of differential trajectories of change. With regard to individuals' environments, we
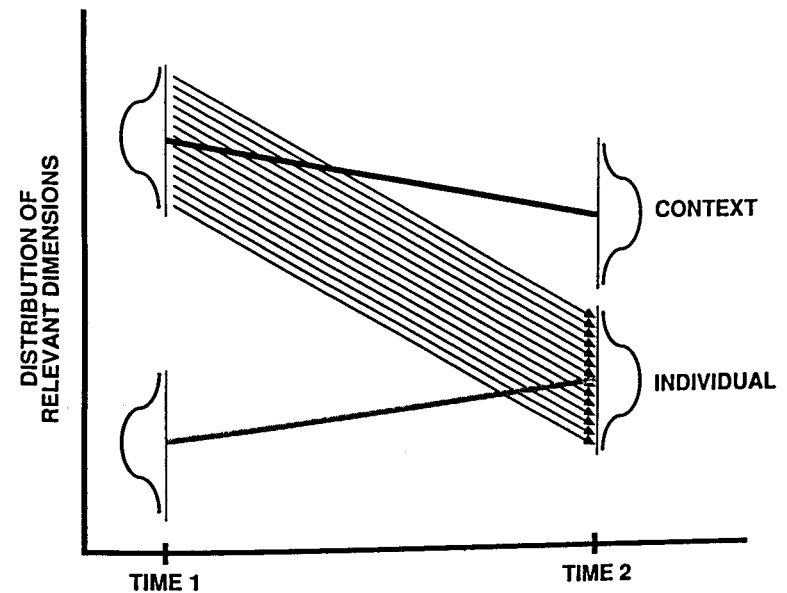
Figure 6.1. The Study of Individual-Context Development: Examining Interindividual and Intercontext Covariation Across Time Versus Examining the Covariation of Trajectories

have to be aware that differences in *their* developmental trajectories may similarly exist and these different patterns of change may produce differential impact on individuals. Thus when the possibility of context development is acknowledged, the task of examining its influences on individuals can be characterized as finding the differences in individuals' environmental changes that are responsible for differences in individuals' developmental trajectories.

An example is given in Figure 6.1; for reasons of simplicity, both interindividual and inter-environmental differences are assumed to be stable across time. The traditional method of empirically examining "context effects," by correlating outcome scores at Time *n* with context scores at Time *n* − 1 (or relating intercontext differences to interindividual differences at any time), cannot reveal information about the connection between changing contextual characteristics and the development of the outcomes. In fact, it would be possible to find a

correlation of +1.0 between context and outcome variables even when the correlation between individual and environmental *changes* was negative. As Figure 6.1 shows, this could occur when the context decreases across time and the individual increases.

Developmental Frame

Can we assume that contextual influences on individual trajectories will trigger the same effects for all individuals in the same way, at any time in the development of an individual? Probably not. At specific times, individuals and microsystems, for example, might be immune to radical changes in the outer environment; at other times, individuals might be very sensitive to even minor contextual changes. For example, Stewart and Healy (1989) provide arguments for assuming that socio-historic events have differential impact on individuals, depending on the stage of life when they experience the event.

The frame issue addresses the likelihood that points of measurement in a study are timed so as to capture theoretically interesting processes of context-individual influences. Unless one makes the assumptions that processes are very global, regular, frequent, cross-situationally stable, and dominant, a developmental frame would be needed from which points in time can be derived that should be central for emerging change, and that takes into account the pace of change in these processes. This metric could then be used to localize times for measurement when the impact of the context on the individual should be present.

Although these windows of susceptibility to contextual influences exhibit a close similarity to the concept of "sensitive periods," they address a much broader and more general issue. The notion of sensitive periods usually entails three restrictive criteria: (1) the window of influence is open at one developmental period only and is subsequently permanently closed; (2) the developmental consequences are significant and permanent; and (3) the resulting developmental pathway is unchangeable (e.g., Bornstein, 1989). In contrast, time frames are useful for the study of any phenomenon for which the magnitude of contextual impact differs as a function of the individual's developmental level. They refer to any time in development at which an individual is differentially open to outside influences or "ready to be socialized" (Maccoby & Martin, 1983). As opposed to sensitive periods,

time frames during which windows of influence are open can reoccur; their developmental consequences may be minor and temporary; and the resulting developmental pathways may be modifiable by subsequent contextual influences. In this general sense, sensitive periods are a special case of time frames. Hence, psychological theories are needed for determining (1) at what times those "windows" are likely to be "open" with regard to which developmental phenomenon, (2) which individuals will be susceptible to environmental changes, and (3) for what length of time these influences will have an impact on the individual.

An example can be provided by mothers' use of discipline techniques in interactions with their children. It could reasonably be argued that these techniques become most salient at those times in development when new competencies emerge in children and need to be shaped to conform with cultural or social standards. Each time new competencies emerge, concurrent child-rearing techniques would again be expected to have a strong impact on child behavior.

Models Indifferent to Environmental Development

On a large scale and historically, there may be no doubt that contexts change across time. Theoretical accounts of contextual change are typically found in the domains of history or sociology (Cain, 1987; Elder, 1985; Featherman, Spenner, & Tsunematsu, 1988; Riley, Johnson, & Foner, 1972). In developmental psychology, interest in contextual change mainly emerged out of a life-span perspective (cf. Baltes, 1987). Here, these notions became widely accepted when research on the history-graded changes of social environments showed that changing developmental conditions for different birth cohorts could be related to marked change in psychological functioning across time (P. B. Baltes, Cornelius, & Nesselroade, 1979; Nesselroade & Baltes, 1984; Schaie, 1965).

With regard to the span of human life, however, we have to ask ourselves whether the pacing of contextual change can be considered important for intraindividual development—as historically short-lived as we are—or only for explanations of cross-cohort differences. Traditionally, developmental psychology seems to rely on assumptions that contexts are stable and exert quite stable influences on individuals. As Hetherington and Baltes (1988) state, "much developmental

research still presents a picture of the child developing within rather static ecosystems. Certainly more attention is focused on individual change than on contextual change" (p. 12). For example, in child psychology, child-rearing styles, qualities of the family home, teaching styles, or sociodemographic marker variables have traditionally been employed to study socialization effects in children's development. All of these do not, by and large, seem to be regarded as phenomena captured at certain points in time, but as features that are stable and exert relatively constant and long-lasting influences on the individual.

TRADITIONAL CONCEPTIONS OF ENVIRONMENTAL INFLUENCES: THE LAUNCH MODEL

The methodological model most commonly used to study contextual influences on individual development ignores contextual change; we refer to it as the *launch model*. We will briefly describe and illustrate it (see also Connell & Skinner, 1990) to provide a basis of comparison for models that allow the examination of environmental change. We do not hold that this model cannot characterize many phenomena. We simply argue that its usefulness is more restricted than its current widespread application would imply and that researchers should consider a variety of other models of context-individual development relations before choosing the model appropriate to their target of study.

The launch model depicts a time-lagged influence from variation in contextual antecedents to variation in subsequent developmental outcomes. Specifically, it uses the (interindividual) distribution of context variables at Time 1 to predict the (interindividual) distribution of outcomes at Time 2 (usually controlling for outcomes at Time 1) (see Figure 6.2). This model does not necessarily assume environmental stability; contextual variables may change from Time 1 to Time 2. It does, however, assume that such contextual change, if it does occur, is irrelevant to the prediction of Time 2 outcome scores (or of change in outcome scores from Time 1 to Time 2). The causal process represented by this model is analogous to a catapult, in which the initial forces of the contextual antecedent are the major determinants of the shape of the curve of the outcome.

Phenomena for which launch models may be useful representations are those that are open to influence from the environment at one point
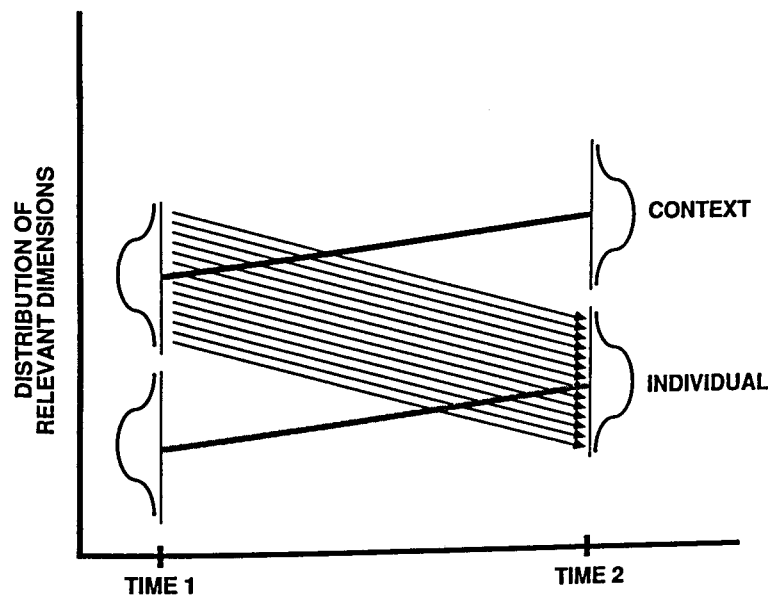
Figure 6.2. The Study of Context-Individual Influences Within the "Launch Model": Using Variations in Contextual Antecedents to Predict Subsequent Interindividual Differences

and subsequently become "sealed off." Examples include, but are not restricted to, research on sensitive periods (Bornstein, 1989). For example, according to learned helplessness theories, children who are exposed to initially high levels of noncontingency between their actions and outcomes subsequently show a variety of affective, cognitive, and motivational deficits (Seligman, 1975). These deficits appear even in environments that have changed and are characterized by high action-outcome contingencies. The initial context "launched" a behavioral trajectory that (by definition) is impervious to changing environmental conditions. Intervention researchers sometimes refer to programs designed to prevent helplessness deficits (for example, by exposing children to high doses of contingency) as "inocculation" programs. Again, this implies that early experiences will determine later behavior, even in the face of changing environmental conditions.

Constructs or Methods

The launch model, which assumes that contextual change is irrelevant to the prediction of the target outcomes, has up to now accounted for a large portion of the research on environmental influences on individual development. If, in fact, this is the most prevalent model used to study contextual influences, how is it that it has been so successful in informing us about the antecedents of development? Does its success justify ignoring models of contextual change in future research?

We would argue that most developmental research, although using this model, has nevertheless attempted to incorporate notions of environmental development. Where? In the constructs: Under the rubric of developmental equivalence, researchers have often changed the operational definitions of contextual constructs as a function of the developmental level of the target. For example, the specific behavioral referents of the construct "parental sensitivity" differ for parents of 18-month-olds and 5-year-olds. Hence, parents who display "sensitive parenting" when their children are 18 months and 5 years old, are not producing a constant environment; instead, they are showing parental adjustment of their behaviors to the developmental level of their children. In our view, changing construct referents to be "developmentally appropriate" is not a measurement issue. Instead, these changes should be the target of empirical inquiry. Specifically, we argue for removing contextual changes from constructs and analyzing them using appropriate methodologies. As alternatives to the launch model, we suggest four models that differ with regard to the nature and role of environmental change in the development of individuals.

SYSTEMATIC AGE DIFFERENCES IN ENVIRONMENTS: THE DEVELOPMENTAL TRANSITION MODEL

Traditionally, when changes of contexts were included in our picture of influences on individuals, these were conceived as processes of transitions across contexts (Bronfenbrenner & Crouter, 1983; Whiting, 1980). For individuals at different ages, different contextual influences are at work; the notion that contexts actually change themselves is not entailed in the conceptualization of individual development.
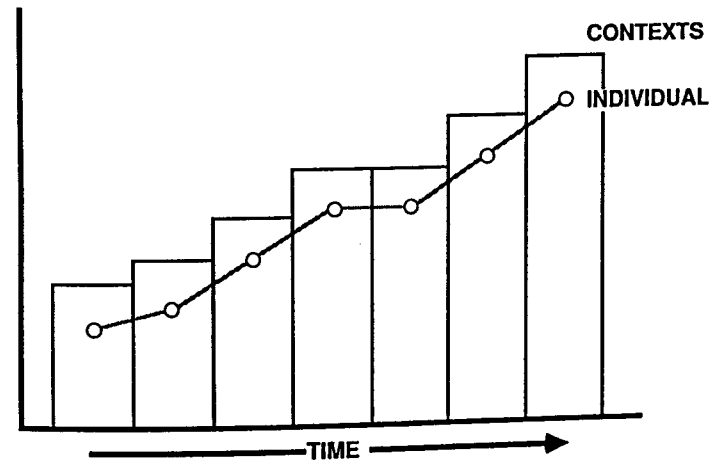

Figure 6.3. The Study of Individual-Context Influences With the "Developmental Transition Model": Individual Development Proceeding Across Multiple Contexts

According to the *developmental transition model,* individual development takes place within a changing environment: Individuals experience systematic changes in environments, not because environments are developing, but because people are moving across different age-graded contexts (see Figure 6.3). For these transitions to be able to explain systematic age changes, the context transitions must themselves be organized or stratified according to age. Is there evidence that contexts are age-graded? And if so, according to what features does age-gradation occur?

Age-Graded Environments

In our everyday experience, examples are widespread for contexts that are culturally designed as explicitly age-graded or age specific. There are, at early times, families, schools, and orphanages, which are designed for children. Schools, most clearly, are cultural institutions that exhibit a strong age stratification (Minuchin & Shapiro, 1983). On the other end of the life-span, there are retirement homes

and other institutions for the care of the elderly. Similarly, certain contexts exhibit features of age segregation, which may be due to cultural rules (laws) or processes of self-selection: There are movies or kinds of bars that are explicitly reserved for adults only; there are hang-outs or restaurants that are typically frequented by adolescents.

Two kinds of contexts will be distinguished: culturally designed or institutionalized contexts (e.g., families, schools, institutions), and spontaneous (Dannefer & Perlmutter, 1990) or self-selected contexts (e.g., peer groups, friendships, partnerships). Culturally designed environments are designed for specific individuals, in our case for individuals of specific ages. Age is a necessary condition for the individuals to be there and age of inhabitants is one of the constituting factors of the ecology. In contrast, within self-selected environments, individuals are the creators of any age-specificity, and to some extent the designers of the environment's characteristics.

The prevalence of these two kinds of contexts for individuals across their ages can be age-graded in itself. In early childhood, children's small range of mobility largely limits their access to a wide range of contexts; the major contextual agents are mothers, fathers (or other caretakers), and siblings. These contextual agents are culturally or biologically assigned. In childhood, the environment's effect on children's development may be effectively captured in the assignment of the child to the family setting and its socializing impact (Whiting, 1980). With increasing age, however, the relative importance of family-determined settings decreases. Which contexts are experienced and which are not will more and more become a matter to be decided by the individual him- or herself. For example, a first major step in acquiring self-determination regarding which contexts to join is the onset of being able to walk.

With further increments in independence, individuals become increasingly able to determine for themselves those micro-contextual influences to which they will be exposed. For example, during early childhood, the context of schooling includes a large number of potential socializing agents from which individuals can select (e.g., Cairns, Neckerman, & Cairns, 1989; Strayer & Noel, 1986). Objectively defined are, of course, the boundary conditions in which these self-selection processes take place (classrooms, schools, neighborhoods, etc.).

Further age-related changes in developmentally relevant contexts can be noted in adolescence and adulthood, when contexts can be selected according to the options they provide for further development

of individuals (jobs, university training programs, mentors, religious affiliations). The selection of a constant primary partner and the legalization of this partnership leads to institutionalization of a self-selected context. And, the ability to reproduce allows adults to produce contexts that then actually feed back into their own further development.

Finally, old age presents new changes in environments. Processes of biological decline are likely to set limits to individuals' mobility and power in handling contexts; these are accompanied by cumulative losses of contexts and contextual agents that were self-selected across time—important friends, mentors, and family members are lost. Successful aging is assumed to depend largely on how individuals manage to cope with these age-related transitions (cf. P. B. Baltes & M. M. Baltes, 1990). In the extreme case of living in institutions for the elderly, an individual's context might be restricted to a number of professional caretakers (cf. M. M. Baltes & Reisenzein, 1986).

The distinction between self-selected and culturally assigned contexts might be helpful for examining interindividual differences in contextual transitions. The focus would be on the relative amount of variability in these transitions. Thus higher diversity can be expected with regard to transitions across self-selected contexts (especially after childhood), whereas individuals' transitions across culturally assigned contexts may appear quite age-normative (especially at younger ages). Even for these, however, interindividual differences may be substantial. Gifted children, for example, can experience developmental transitions, even in terms of culturally assigned contexts, that are quite different from those of their average agemates.

In sum, the developmental transition model describes one way in which individuals experience different contexts at differing points in development. In this model, environmental change is experienced by the individual while moving across different contexts. Although the explication of developmental transitions may require cultural and sociological theories of age stratification (Cain, 1987; Riley et al., 1972), the model does not necessarily involve conceptions of a changing or developing environment. We turn next to three models in which this is attempted.

Models Incorporating Environmental Development and Change

The three models we discuss in this section have in common the notion that the environment itself is changing as the individual

develops within it. According to each, a correlation would be expected between individual and contextual trajectories of change; however, each posits a different explanatory scenario. The first, termed *weather model,* describes systematic environmental change that impacts on individual development but is not initiated or shaped by the individual. The second, the *developmental co-adaptation model,* depicts individual-context influences in which changes in individual and environment feed back into each other reciprocally (cf. dynamic interactionism, R. M. Lerner, 1979). The third, the *developmental attunement model,* describes reciprocal individual-context development in which the changes of the environment are calibrated to the development of the individual (cf. apprenticeship or scaffolding: Bruner, 1982; Kaye, 1982). We will illustrate each model using existing research when possible. Because some of the models are not yet used widely, however, we will also speculate about the empirical questions they might generate. Throughout, we will discuss the models as if the target variables were interindividual differences in individual trajectories.

UNIDIRECTIONAL INFLUENCES OF ENVIRONMENTS ON INDIVIDUALS: THE WEATHER MODEL OF CO-DEVELOPMENT

The individual-context relations described by this model are analogous to the weather: Although changes in contextual factors are essential in influencing individual trajectories, they are not initiated or steered in any way by a target individual (see Figure 6.4). This conception of environmental change differs from subsequent models in that changes in the context are in no way calibrated or significantly determined by the developing individual him- or herself.

Within such models, theories would be needed that identify significant global changes in the environments of individuals, determine the environmental dimensions that are changing, and the interindividual differences in these patterns of changes, and then suggest the consequences such changes may have for the development of target individuals of different ages. Two examples will be provided from research on siblings and on critical life events.
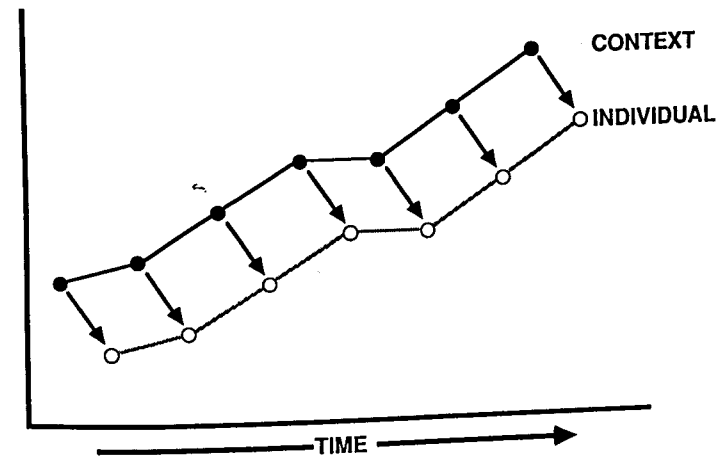

Figure 6.4. The Study of Individual-Context Co-Development With the "Weather Model": Individual Development Influenced by Contextual Change

Birth of a Sibling as a Significant Contextual Change

Although one of the biggest normative shifts in a child's early life occurs when a new sibling is brought home (Kreppner, 1989; Kreppner, Paulsen, & Schuetze, 1982), rarely do children have any influence over the advent of this change. A wide variety of individual differences would be expected in the environmental changes brought about by a sibling's arrival, depending on a host of factors, including, for example, the temperament and health of the new child (e.g., a premature sibling may result in radical changes for the older child), and the child-care arrangements (extended family care may have already added younger children to the child's daily life). The most common dimensions of the environment that this global change affects include changes in parents' energy level, patience, amount of attention, and responsiveness to requests/bids from the older child; for the older child, especially affected seems to be the amount of time available with the mother. Potential changes could also range from the amount of private space the child is allowed to the level and frequency of parental conflict.

Each of the dimensions of environmental changes suggests target developmental phenomena that could be influenced by the birth of a sibling. Especially critical in identifying the consequences would be the age of the older sibling. For example, decreases in amount of time and responsiveness of mothers may have an impact on their children's attachment to them, especially for younger children (the age from 6 to 18 months is hypothesized to be important for attachment formation). Likewise, if decreases in interactions with mothers are accompanied by increases in time spent with fathers (Kreppner et al., 1982), then corresponding increases in attachment with fathers might be expected. Conceptualizing the birth of a sibling within weather models allows us to focus on "events" as a series of shifts in the environment, over which the child has little control, but which may nevertheless have important consequences for the child's development in a variety of domains.

Parents' Critical Life Events as Environmental Changes for Their Children

The weather model might also provide an organizing framework for researchers studying the effects of parents' critical life events on their children. The occurrence of a critical life event can be used as a marker to locate the advent of a contextual shift. An illustration can be found in the work on the effects of parental divorce on children's development, conducted by Hetherington and her colleagues (Hetherington, 1989; Hetherington & Camara, 1984; Hetherington, Cox, & Cox, 1982). Parental divorce, leading to the partial loss of one socializing agent in the child's ecology, at the same time seems to be associated with a high likelihood for family income loss, shift in residence, social isolation, and disruptions in parenting behavior. It seems that these shifts in the environment (along with more salutary shifts, such as decreases in parental conflict and increases in independence) might account for the effects of divorce on individual development. To test a weather model of co-development, the trajectories of the contextual factors (e.g., decreases in time spent with parents, increases in independence support) would be assessed and then examined for the effectiveness in accounting for corresponding trajectories of individual change (i.e., decreases in attachment security and increases in independence, respectively).

Critical life events of adults could also be seen as environmental shifts for their other important social partners. For example, an older person's illness may produce significant changes in the lives of his or her grown children; a teenager's pregnancy could change the lives of all other family members; loss of a wife's job would shift the context for a husband. In fact, some of the most stressful changes in women's lives appear to be the result of critical life events in the other members of their social network (Belle, 1982). The weather model attempts to highlight the dynamic nature of "events" (for review, see Sugarman, 1986, chapter 6), which often produce multiple environmental changes in the lives of those who experience them as well as for their social partners. The analysis of these changes, their dimensions and variations in their trajectories, may contribute to our understanding of their effects on individuals' development and on the interindividual differences therein.

RECIPROCAL INDIVIDUAL-ENVIRONMENT CHANGE: THE DEVELOPMENTAL CO-ADAPTATION MODEL

This model, like that described previously, depicts environments that are changing. Unlike in the one described above, however, in the current model the changes and developments of the context are reciprocally linked to the target individual (Bell, 1979; R. M. Lerner & Busch-Rossnagel, 1981). These models have in common that the explanation for environmental changes involves how the target individual's behaviors or characteristics produce contextual change. Although these environmental changes include reactions to the individual (see Figure 6.5), they are not calibrated to the target individual's development, nor produced by a developmental agenda of the context.

Changes in the environment that are the product of individual influences are easiest to imagine when social partners are the contextual elements of interest. More difficult is tracing the link from the individual to changes in aspects of the social micro-ecology that should feed back to the developing target individual. Theories of two explanatory links are needed: (1) how the social contextual antecedents influence individual development; and (2) how the individual antecedents produce changes in the relevant aspects of the social context. Two general functions that these reciprocal influences could
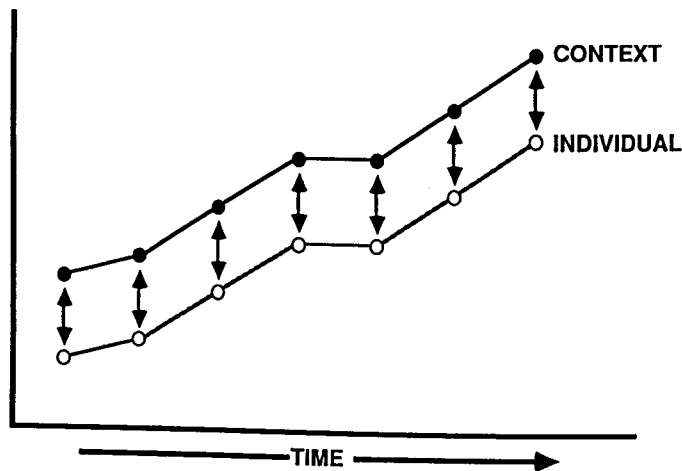
Figure 6.5. The Study of Individual-Context Co-Development Within the "Developmental Co-Adaptation Model": Reciprocal Exchanges Between Developing Persons and Changing Environments

perform over time can be imagined: one in which individual or environmental changes compensate for changes in the other; and one in which individuals and environments magnify each other's changes. Over time, the first would result in a picture of a relatively flat developmental trajectory, with low stability of interindividual differences; the latter would produce steeper developmental trajectories with relatively high stability of interindividual differences. Three illustrations of the developmental co-adaptation model are described: mutual socialization in peer groups, coping with critical life events (an example of compensation), and motivational dynamics in the classroom (an example of magnification).

Individual-Context Reciprocity in Peer Groups

In tracing mutual socialization in children's peer relations, the first step would be to assess a child's own individual characteristics as well as those of his or her peer group, and to chart changes in both child and peer group members over time (on methodological issues, see Cairns, 1983; Cairns, Gariepy, & Kindermann, 1990). As the second

step, it would be a challenge to make a theoretically coherent case for whether and how these two sets of developments would mutually interact to shape the developmental outcomes of the target child (Hartup, 1983).

The initial way in which children influence their peer groups is by selecting social partners among available candidates. Beyond this, each child participates in the group dynamics of relatedness and influence (Lynch & Wellborn, 1988). For example, the more a child cares for and about her individual peer group members, the more influence she allows those members to have on her. At the same time, children play differentially active roles in constructing changing patterns of peer group norms and activities, which will in turn shape the individual child's experiences and subsequent development (e.g., Cairns et al., 1989; Dunphy, 1963; Furman, 1989; Kindermann & Belmont, 1990; Ladd, Price, & Hart, 1990). When organized by the co-adaptation model, a study of such processes would include an assessment of changing group norms and activities, of the target child's role in co-constructing the norms and activities, and of the impact of those on the child's subsequent behavior and development.

Coping as Compensation for Changes Produced by Stressful Life Events

Developmental co-adaptation models might provide an organizing frame for researchers who study coping processes. Researchers argue that coping processes (as well as the stressful life events that invoke coping) consist not merely of an episode but are comprised of a series of events that take place over time (Folkman, 1984; Skinner & Wellborn, in press). Individuals cope with environmental changes through processes of appraisal, reframing, and active attempts to compensate for or restore loss. For example, the loss of a job encompasses many changes, including perhaps the loss of a social network, a source of self-esteem, respect of others, financial support, and so on, down to loss of a reason to get up in the morning. Over time, the effects of the loss on the individual's developmental trajectory will depend, among other things, on the extent to which these losses are compensated for by changes in the individual and other social partners. Hence, the pattern of change in these contextual elements will influence the individual and the individual will in turn, through his or her coping responses,

influence the rate and nature of contextual changes (including the probability of getting a new job). Together, these reciprocal changes will predict the developmental effects of the loss.

School Motivation as an Example of Magnification of Individual-Context Influences

Patterns of mutual adaptation may evolve into a process in which individual and contextual development reciprocally magnify each other over time. For example, researchers studying the development of children's motivation in school have identified a range of teacher behaviors that are hypothesized to promote or undermine student motivation (Connell & Wellborn, 1990; Skinner, 1990). These behavioral dimensions, which are derived from a theory of psychological needs, include structure versus chaos, autonomy support versus control, and involvement versus neglect. The theory holds that when teachers meet students' basic psychological needs, the students will show optimal behavioral and emotional engagement in learning activities (Connell & Wellborn, 1990).

Recent research has focused on the reciprocal side of these student-teacher interactions, namely, on the effects of student motivation on teacher behavior. According to this research, one major determinant of whether teachers are, for example, autonomy supportive or controlling, is student motivation (Deci & Ryan, 1985). Over time, students who show signs of emotional alienation from learning (e.g., rebelliousness or boredom) are responded to by teachers with increasingly more noncontingent and controlling behaviors (Skinner & Belmont, 1990). It is tempting to speculate that, over time, dynamic systems of mutual influence are constructed in which motivated students are treated by teachers in such a way that their motivational development is optimized, and disaffected students are dealt with in ways that further undermine their commitment to school (Skinner, 1990).

DEVELOPMENTALLY ADJUSTED ENVIRONMENTAL CHANGE: THE DEVELOPMENTAL ATTUNEMENT MODEL

The attunement model describes individual-context relations in which the development of the individual is an *agenda* item for the
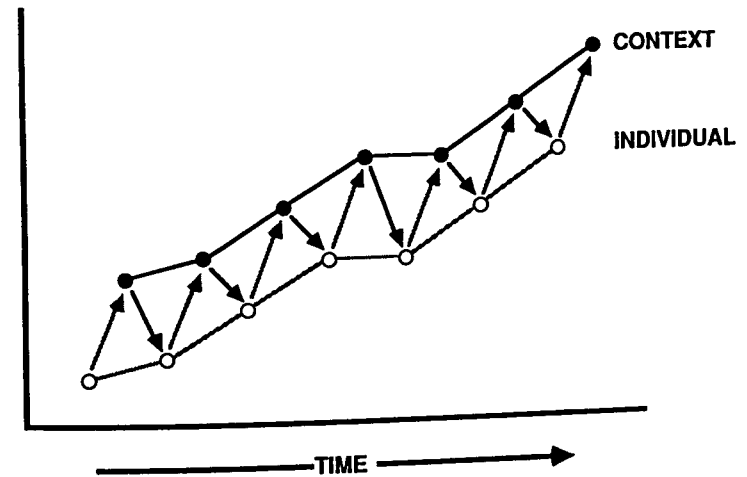
Figure 6.6. The Study of Individual-Context Co-Development Within the "Attunement Model": Reciprocal Exchanges Between Developing Persons and Changing Environments With a Developmental Agenda

context. This model would be a contender for accounts of any context that is entrusted by the culture with nurturance or (re-)socialization activities, such as parents, schools, orphanages, self-help groups, hospitals, prisons, or institutions for the elderly (even though many of these contexts may not actually show such attunement to their charges). This model might also characterize relations in which the context elects to assume these duties; examples include relationships with mentors, coaches, siblings, or grandparents.

Models of developmental attunement are characterized by a pattern of environmental change that is calibrated according to the target individual's development and is guided by the contexts' goals to shape the individual's trajectory (see Figure 6.6).

In these models, complex theories are required that would include explanations of (1) the agenda of the context; (2) the impact of the contextual agenda on what the context actually does; (3) how the resulting socializing interaction patterns shape the development of the target individual; and (4) how developmental change of the individual feeds back onto changes in the agenda and behavior of the context.

Environmental Agendas

Consistent with the conceptualizations of contexts that are increasingly personalized, attunement models view contextual influences as provided by people that carry specific motives and goals for developing individuals (cf. Bronfenbrenner, 1989). The parent-child relationship is the easiest context-individual relation to view in this light. In general, parents can be assumed to have an investment in children's development. In any given culture, parents' opinions about the "right" developmental trajectory in early childhood are presumably quite strong. Even the child's physical environment is "set by parental choices" (Maccoby & Jacklin, 1983, p. 75), which may reflect parental expectations and goals for the child; socialization goals are often "coded" into the objects that serve as material contexts for children (Valsiner, 1987).

During the last decade, research has examined parents' beliefs about and expectations for their children's development (Sigel, 1985). Regarding their children, mothers carry more or less explicit timetables or curricula for achievements and developmental changes (Goodnow, 1984; Goodnow, Cashmore, Cotton, & Knight, 1984). Recently, research has focused on the impact of these beliefs on parental behavior, which, in turn, shapes children's subsequent development (Sigel, 1990).

Havighurst's (1972) conceptualization of developmental tasks may be useful to capture those culture-specific systems of guidance for individual development, which are arranged according to more or less explicit age-specific timetables (Reinert, 1980). Children's timely and successful development can be considered a developmental task for parents (Duvall, 1971). In conceptualizing the environment's agenda for individuals within the family, the concept may be helpful for resolving two issues: (1) the provision of a theoretical frame to specify the aspects around which individuals and their contexts show reciprocal attunement (the agenda that the context holds); and (2) the provision of a metric for these processes (the time frame for the context's agenda). In other words, the concept may provide a base for determining when processes of attunement occur, how long they will last, and what behavior domains they will be focusing on.

Localizing Contextual Change

For the task of framing individual-context attunement, again, the individual's developmental trajectory is used as the anchoring feature,

but, within this model, in conjunction with the context's agenda regarding the individual's trajectory. As indicated above, the concept of developmental tasks may be a helpful tool to pinpoint those times in an individual's development when marked changes occur within the individual, and corresponding adjustments of the contextual agents reflect their developmental agenda for the individual (Kindermann & Skinner, 1988). In general, knowledge of normative developmental pathways can be employed for determining windows during which socializing agents are expected to adjust their socializing behaviors.

With regard to later childhood, the school setting provides a paradigmatic case of an ecology in which individual-context relations are age- and competence-stratified. Curricula can be understood as contextual prescriptions of when students are expected to master specific tasks. These prescriptions specify at what ages which competencies are to be fostered by what kind of teaching strategies, and for what period of time. Teachers, as contextual agents, are trained to behave differently with students of different competence levels and to adjust their teaching behavior toward children's changing competence. Thus a developmental schedule of context-individual attunement is built into the design of the ecology.

An important feature of contextual agendas is that they may differ for children of differing ages, sexes, or races. Within the school system, teachers have clearly different expectations of pace, abilities, and optimal level of accomplishment for different children (cf. Jussim, 1989; Rosenthal & Jacobson, 1968). These are institutionalized in all forms of tracking, including programs of special education and giftedness. Similar features of a developmental agenda of contexts for individuals might characterize a large variety of individual-context relationships in later life, for example, in apprenticeship, mentoring, or counseling relationships.

Adjustment of Socializing Interactions

The notion of developmental adjustment in socializing ecologies is not new to developmental psychology. An early example is William Stern's (1930) principle of "convergence" of caretakers' demands and individual's developmental tendencies. Currently, approaches that actually propose that processes of contextual attunement are one of the driving forces of individual development are gaining attention in research on children's development.

To some extent, this trend to include parental adjustment in the picture of children's developmental change can be attributed to the recent popularity of the work of Vygotsky (1978; see also Rogoff, 1990; Rogoff & Lave, 1984; Rogoff & Wertsch, 1984; Valsiner, 1984; Valsiner & van der Veer, in press). Similar frameworks refer to concepts as "scaffolding" (Bruner, 1982), "apprenticeship" (Kaye, 1982), or "readiness to be socialized" (Maccoby & Martin, 1983). These notions are encompassed, for example, in studies examining changes in instruction and support when mothers interacted with their children in games (e.g., Hodapp, Goldfield, & Boyatzis, 1984) or worked jointly with them on laboratory tasks (e.g., Heckhausen 1987; Rogoff, Ellis, & Gardner, 1984).

An illustration of natural processes of individual-context attunement can be found in a study that examined everyday mother-child interactions in basic developmental tasks of early childhood. The focus was on changes in the contingencies mothers provided for children's behaviors in developmental tasks, specifically in the tasks of learning to walk, learning to eat, and learning to dress alone (Kindermann, 1991). In a short-term longitudinal time frame, mothers' perceptions of children's progress in these developmental tasks were assessed, along with in vivo observations of mother-child interactions. The results showed that maternal adjustments in behavior contingencies (behavior consequences following children's independent and dependent task related behaviors) occurred in attunement to mothers' changing perceptions of their children's competence in the tasks.

Two key characteristics of contextual attunement to individual's change should be highlighted. First, in terms of the theoretical frame, the target phenomenon (children's growing competence in the developmental tasks) was theoretically linked to what the context "does" in fostering children's mastery of the tasks—in this case, the supportive behavior of the parental caretaker. Second, the target phenomena were conceived as the developmental trajectories of individuals and their contexts. Hence, the focus of an attunement framework is not on how differences between individuals relate to differences in contexts across time, but on how changes within individuals relate to changes within developing contexts that are assumed to hold an agenda for these individuals.

What are the consequences of adopting an attunement model for developmental research on interindividual differences across development? Clearly, the focus is on the relation of intraindividual and intracontextual change. First, processes of contextual attunement need

to be distinguished with regard to the agendas contexts hold for different individuals. For example, for several of their children, parents can have quite different developmental goals.

Second, studies could focus on interindividual differences in the extent to which contexts are attuned to individuals' development. For example, consider that teachers' classroom teaching may be calibrated to the mean level of ability in a group of children. The rate of teachers' environmental change will then be attuned to average children only; children of higher and lower ability will not experience the teachers' change as attuned to their own state of development.

Third, differences in attunement processes can be understood as consequences of differential environmental trajectories of change. That is, attunement differences can be related to differences in the environment's capacity to calibrate its own influences to specific individuals' state of development. For example, according to J. V. Lerner and R. M. Lerner's (1983) formulation of a model of "goodness of fit" between parents and their developing children, parents can differ in their adjustment to changing needs of children who show different characteristics; in this case, to children with an easy versus difficult temperament. The focus would be on states of mismatch between parental demands and children's temperament across time. Inter-context differences in how parents are able to attune to their children's development may have long-term consequences for further individual development.

It might not be too speculative to argue that similar features of attunement between contexts and individuals might characterize a large variety of individual-context relationships in later life. For example, apprenticeship, mentoring, or counseling relationships may exhibit patterns of change in reciprocal individual-context influences that appear compatible with an attunement framework. Again, differential consequences of these relationships would be expected to be based not only on what individuals and contextual agents bring into the situation and how they interact, but also on how contexts and individuals manage to adjust to each other's change across time.

Discussion

This chapter is based on the premise that the study of the processes of individual development will be enriched by a careful consideration

of models of developmental contexts: what their components are, what their functions may be, and to what extent they develop themselves. As researchers, our ability to explain the sources and outcomes of individual development will depend on our conceptualization of context-individual relations. First, it will depend on our theories about those contextual characteristics that are influence for specific target developmental phenomena and the nature and timing of the context's influencing impact. Second, it will depend on the position we take on the issues of contextual change and stability. Are individual-context relations best envisioned as movements of individuals across relatively stable "envelopes," or as individual development within developing contexts? Third, it will depend on how we deal with the issue of contextual change methodologically. Do we want to center, as is typical, on the relations of interindividual and inter-context differences across time, or, as is rarely done, on the relations of individual and contextual trajectories across time?

With regard to the issue of differential stability and change, the notion of environmental development requires us to differentiate individuals' change and stability according to the extent to which individual development occurs within environments that are themselves stable or changing. Furthermore, we have to include notions of reciprocal influences between individuals and contexts. The degree to which changes in environments are open to influences from individuals might vary from no control (as depicted in the weather model) to processes of mutual calibration (as in the co-development and attunement models). Hence, interindividual differences in developmental change can possibly occur within (or despite) environments that are stable, as well as within environments that are changing.

We conclude by briefly addressing two questions. First, what does one gain by understanding contexts as stable entities, which affect individuals like a constant frame? And second, what does one lose? The major advantage of assuming a stable set of contextual influences is that it is simpler. Theories of individual development within stable contexts have only one parameter that changes: the individual. Multiple levels of context may be involved as sources of individual development, but their structure and impact on individuals remain constant. Only one explanatory theory is needed, namely, of individual development; the impact of contextual development can remain an issue for historians and sociologists. Most importantly, we can continue to use familiar methods to capture context-individual influences, as

summarized by the launch model. Finally, we still can incorporate one notion of contextual variation across time: Individuals can experience environmental change by moving across contexts as described by the developmental transition model.

What do we lose by assuming that the context is relatively stable or that whatever changes are occurring are irrelevant to our understanding of individual development? We would argue that we lose as much by assuming that contexts are stable as we would lose if we assumed that individuals are not developing. First, we would lose track of that part of individual development that is the result of adaptation to changing contextual demands (as opposed to new contextual demands). Second, we would underestimate the potential individuals have to instigate and shape change in the contexts in which they find themselves. Third, we would not take seriously theories that hold that the most powerful contexts are *social*. If contexts are comprised of other people, then development of the social context can never be ruled out a priori. Finally, we would not learn about the contexts' capacities to attend and adjust to the developmental rhythms of individuals.

Many subdisciplines of psychology argue that the most interesting questions center on how individuals *differ* from each other and on how stable these differences are, but do not regard as equally important the question of how individuals *change*. The same distinction can be applied to questions of context differences and contextual change. Developmentalists have argued vigorously about how fundamental the issue of change is to an understanding of individuals, but have tended to take a largely "nondevelopmental" stand with respect to contextual factors.

Our goal in writing this chapter was not to attempt to reconfigure the landscape of research on individual-context influences. Neither do we regard our arguments for contextual development as being radical or new. Rather, we see notions of contextual change and development as an emerging field of interest for developmentalists, deeply rooted within many developmental disciplines. With this chapter, we only wished to encourage theorists to consider the theoretical and methodological ramifications of the notion that the contexts in which individuals develop are developing as well. If some researchers decide to re-examine this possibility for some target developmental phenomenon, for some features of the context, at some key points in development, the purpose of this chapter will have been achieved.

Note

1. The defining characteristics of systems in the social sciences are currently a matter of intense debate (see, for example, Bronfenbrenner, 1989; Dannefer, in press); we use the term in its most general meta-theoretical sense.

References

Baltes, M. M., & Reisenzein, R. (1986). The social world in long-term care institutions: Psychosocial control toward dependency? In M. M. Baltes & P. B. Baltes (Eds.), *Aging and the psychology of control* (pp. 315-344). Hillsdale, NJ: Lawrence Erlbaum.

Baltes, P. B. (1987). Theoretical propositions of life-span developmental psychology: On the dynamics between growth and decline. *Developmental Psychology, 23,* 611-626.

Baltes, P. B., & Baltes, M. M. (1990). *Successful aging: Perspectives from the behavioral sciences.* New York: Cambridge University Press.

Baltes, P. B., Cornelius, S. W., & Nesselroade, J. R. (1979). Cohort effects in developmental psychology. In J. R. Nesselroade & P. B. Baltes (Eds.), *Longitudinal research in the study of behavior and development* (pp. 61-87). New York: Academic Press.

Baltes, P. B., Reese, H. W., & Nesselroade, J. R. (1977). *Life-span developmental psychology: Introduction to research methods.* Monterey, CA: Brooks/Cole.

Bell, R. Q. (1979). Parent, child, and reciprocal influences. *American Psychologist, 34,* 821-826.

Belle, D. (1982). The stress of caring: Women as providers of social support. In L. Goldberger & S. Breznitz (Eds.), *Handbook of stress: Theoretical and practical aspects* (pp. 496-505). New York: Free Press.

Bornstein, M. H. (1989). Sensitive periods in development: Structural characteristics and causal interpretations. *Psychological Bulletin, 105,* 179-197.

Brim, O. G., Jr., & Ryff, C. D. (1980). On the properties of life-events. In P. B. Baltes & O. G. Brim, Jr. (Eds.), *Life-span development and behavior* (Vol. 3, pp. 368-388). New York: Academic Press.

Bronfenbrenner, U. (1989). Ecological systems theory. In R. Vasta (Ed.), *Annals of child development* (pp. 187-249). Greenwich, CT: JAI Press.

Bronfenbrenner, U., & Crouter, A. C. (1983). The evolution of environmental models in developmental research. In W. Kessen (Ed.), *Handbook of child psychology* (Vol. 1, pp. 357-414). New York: John Wiley.

Bruner, J. (1982). The organization of action and the nature of the adult-infant transaction. In E. Tronick (Ed.), *Social interchange in infancy: Affect, cognition, and communication.* Baltimore, MD: University Park Press.

Cain, L. D. (1987). Theoretical observations on applied behavioral science. *Journal of Applied Behavioral Science, 23,* 277-294.

Cairns, R. B. (1983). Sociometry, psychometry, and social structure: A commentary on six recent studies of popular, rejected, and neglected children. *Merill-Palmer Quarterly, 29,* 429-438.

Cairns, R. B., Gariepy, J.-L., & Kindermann, T. A. (1990). Identifying social clusters in natural settings. Unpublished manuscript, University of North Carolina, Social Development Laboratory, Chapel Hill.

Cairns, R. B., Neckerman, H. J., & Cairns, B. D. (1989). Social networks and shadows of synchrony. In G. R. Adams, T. P. Gullota, & R. Montemayor (Eds.), *Advances in adolescent development* (pp. 275-305). Newbury Park, CA: Sage.

Connell, J. P., & Skinner, E. A. (1990, April). *Predicting trajectories of academic engagement: A growth curve analysis of children's motivation in school.* Paper presented at the annual meeting of the American Educational Research Association, Boston.

Connell, J. P., & Wellborn, J. G. (1990). Social and psychological influences on engagement and disaffection across the life span: A motivational analysis. In M. Gunnar & L. A. Sroufe (Eds.), *Minnesota Symposium on Child Psychology* (Vol. 22, pp. 43-77). Minneapolis: University of Minnesota Press.

Dannefer, D. (in press). On the conceptualization of context in developmental discourse: Four meanings of context and their implications. In D. L. Featherman, R. M. Lerner, & M. Perlmutter (Eds.), *Life-span development and behavior* (Vol. 10). New York: Academic Press.

Dannefer, D., & Perlmutter, M. (1990). Development as a multidimensional process: Individual and social constituents. *Human Development, 33,* 108-137.

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation in human behavior.* New York: Plenum.

Dunphy, D. C. (1963). The social structure of urban adolescent peer groups. *Sociometry, 26,* 230-246.

Duvall, E. M. (1971). *Family development.* Philadelphia: J. B. Lippincott.

Elder, G. H. (Ed.) (1985). *Life course dynamics: Trajectories and regressions.* Ithaca, NY: Cornell University Press.

Featherman, D. L., Spenner, K. I., & Tsunematsu, N. (1988). Class and the socialization of children: Constancy, change, or irrelevance? In E. M. Hetherington, R. M. Lerner, & M. Perlmutter (Eds.), *Child development in life-span perspective* (pp. 67-90). Hillsdale, NJ: Lawrence Erlbaum.

Folkman, S. (1984). Personal control and stress and coping processes: A theoretical analysis. *Journal of Personality and Social Psychology, 46,* 839-852.

Furman, W. (1989). The development of children's social networks. In D. Belle (Ed.), *Children's social networks and social supports* (pp. 151-172). New York: John Wiley.

Gibson, E. (1982). The concept of affordances in development: The renascence of functionalism. In W. A. Collins (Ed.), *Minnesota Symposium on Child Psychology: The concept of development* (pp. 55-81). Hillsdale, NJ: Lawrence Erlbaum.

Goodnow, J. J. (1984). Parents' ideas about parenting and development: A review of issues and recent work. In M. E. Lamb, A. L. Brown, & B. Rogoff (Eds.), *Advances in developmental psychology* (pp. 193-242). Hillsdale, NJ: Lawrence Erlbaum.

Goodnow, J. J., Cashmore, J., Cotton, S., & Knight, R. (1984). Mothers' developmental timetables in two cultural groups. *International Journal of Psychology, 19,* 193-205.

Green, J. A., Gustafson, G. E., & West, M. J. (1980). Effects of infant development on mother-infant interactions. *Child Development, 51,* 199-207.

Gustafson, G. E. (1984). Effects of the ability to locomote on infants' social and exploratory behaviors. *Developmental Psychology, 20,* 397-405.

Hartup, W. W. (1983). Peer groups. In E. M. Hetherington (Ed.), *Handbook of child psychology* (Vol. 4, pp. 103-196). New York: John Wiley.

Havighurst, R. J. (1972). *Developmental tasks and education.* New York: McKay.

Heckhausen, J. (1987). Balancing for weaknesses and challenging developmental potential: A longitudinal study of mother-infant dyads in apprenticeship interactions. *Developmental Psychology, 23,* 762-770.

Hetherington, E. M. (1989). Family relations six years after divorce. In K. Pasley & M. Ihinger-Tallman (Eds.), *Remarriage and stepparenting today: Research and theory* (pp. 185-205). New York: Garland.

Hetherington, E. M., & Baltes, P. B. (1988). Child psychology and life-span development. In E. M. Hetherington, R. M. Lerner, & M. Perlmutter, (Eds.), *Child development in life-span perspective* (pp. 1-19). Hillsdale, NJ: Lawrence Erlbaum.

Hetherington, E. M., & Camara, K. A. (1984). Families in transition: The process of dissolution and reconstitution. In R. D. Parke (Ed.), *Review of child development research: The family* (Vol. 7, pp. 398-439). Chicago: University of Chicago Press.

Hetherington, E. M., Cox, M., & Cox, R. (1982). Effects of divorce on parents and children. In M. E. Lamb (Ed.), *Nontraditional families: Parenting and child development* (pp. 233-288). Hillsdale, NJ: Lawrence Erlbaum.

Hodapp, R. M., Goldfield, E. C., & Boyatzis, C. J. (1984). The use and effectiveness of maternal scaffolding in mother-infant games. *Child Development, 55,* 772-781.

Jussim, L. (1989). Teacher expectations, self-fulfilling prophecies, perceptual biases, and accuracy. *Journal of Personality and Social Psychology, 57,* 469-480.

Kaye, K. (1982). *The mental and social life of babies: How parents create persons.* Chicago: Harvester Press.

Kindermann, T. A. (1991). *Fostering independence in everyday mother-child interactions: Intra-dyad changes in contingency patterns as children grow competent in developmental tasks.* Unpublished manuscript, Free University Berlin, FRG.

Kindermann, T. A., & Belmont, M. J. (1990, April). *The power of peer groups.* Paper presented at the annual meeting of the American Educational Research Association, Boston.

Kindermann, T. A., & Skinner, E. A. (1988). Developmental tasks as organizers of children's ecologies: Mothers' contingencies as children learn to walk, eat, and dress. In J. Valsiner (Ed.), *Child development within culturally structured environments: Social co-construction and environmental guidance in development.* Vol. 2, (pp. 66-105). Norwood, NJ: Ablex.

Kreppner, K. (1989). Linking infant development-in-context to the investigation of life-span family development. In K. Kreppner & R. M. Lerner (Eds.), *Family systems and life-span development* (pp. 33-64). Hillsdale, NJ: Lawrence Erlbaum.

Kreppner, K., Paulsen, S., & Schuetze, Y. (1982). Infant and family development: From triads to tetrads. *Human Development, 25,* 373-391.

Laboratory of Comparative Human Cognition. (1983). Culture and cognitive development. In W. Kessen (Ed.), *Handbook of child psychology* (Vol. 1, pp. 357-414). New York: John Wiley.

Ladd, G. W., Price, J. M., & Hart, C. H. (1990). Preschooler's peer networks and behavioral orientations: Relationship to social and school adjustment. In S. R. Asher & J. D. Coie (Eds.), *Peer rejection in childhood: Origins* (pp. 90-115). New York: Cambridge University Press.

Lerner, R. M. (1979). A dynamic interactional concept of individual and social relationship development. In R. L. Burgess & T. L. Huston (Eds.), *Social exchange in developing relationships* (pp. 271-305). New York: Academic Press.

Lerner, J. V., & Lerner, R. M. (1983). Temperament and adaptation across life: Theoretical and empirical issues. In P. B. Baltes & O. G. Brim, Jr. (Eds.), *Life-span development and behavior* (Vol. 5, pp. 197-231). New York: Academic Press.

Lerner, R. M., & Busch-Rossnagel, N. A. (Eds.) (1981). *Individuals as producers of their development: A life-span perspective.* New York: Academic Press.

Lynch, M. D., & Wellborn, J. G. (1988, April). *Peer influences, student engagement, and disaffection.* Paper presented at the annual meeting of the American Educational Research Association, New Orleans.

Maccoby, E. E., & Jacklin, C. G. (1983). The "person" characteristics of children and the family as environment. In D. Magnusson & V. L. Allen (Eds.), *Human development: An interactional perspective* (pp. 75-91). New York: Academic Press.

Maccoby, E. E., & Martin, J. A. (1983). Socialization in the context of the family: Parent-child interaction. In E. M. Hetherington (Ed.), *Handbook of child psychology* (Vol. 4, pp. 1-101). New York: John Wiley.

Minuchin, P. P., & Shapiro, E. K. (1983). The school as a context for social development. In E. M. Hetherington (Ed.), *Handbook of child psychology* (Vol. 4, pp. 197-274). New York: John Wiley.

Nesselroade, J. R., & Baltes, P. B. (1984). Sequential strategies and the role of cohort effects in behavioral development: Adolescent personality (1970-1972) as a sample case. In S. A. Mednick, M. Harway, & K. M. Finello (Eds.), *Handbook of longitudinal research* (Vol. 1, pp. 55-87). New York: Praeger.

Reinert, G. (1980). Educational psychology in the context of the human life span. In P. B. Baltes & O. G. Brim, Jr. (Eds.), *Life-span development and behavior* (Vol. 3). New York: Academic Press.

Reese, H. W., & Smyer, M. A. (1983). The dimensionalization of life-events. In E. J. Callahan & K. A. McCluskey (Eds.), *Life-span developmental psychology: Nonnormative life-events* (pp. 1-33). New York: Academic Press.

Riley, M. W., Johnson, M., & Foner, A. (1972). *Aging and society: Vol. 3. A sociology of age stratification.* New York: Russell Sage.

Rogoff, B. (1990). *Apprenticeship in thinking.* New York: Oxford University Press.

Rogoff, B., & Lave, J. (1984) (Eds.). *Everyday cognition: Its development in social context.* Cambridge, MA: Harvard University Press.

Rogoff, B., & Wertsch, J. V. (1984) (Eds.). *Children's learning in the "zone of proximal development": New directions for child development.* San Francisco: Jossey-Bass.

Rogoff, B., Ellis, S., & Gardner, W. (1984). Adjustment of adult-child interaction according to child's age and task. *Developmental Psychology, 20,* 193-199.

Rosenthal, R., & Jacobson, L. (1968). *Pygmalion in the classroom.* New York: Holt, Rinehart & Winston.

Sameroff, A. J. (1983). Developmental systems: Contexts and evolution. In W. Kessen (Ed.), *Handbook of child psychology* (Vol. 1, pp. 237-294). New York: John Wiley.

Scarr, S. (1985). Constructing psychology: Making facts and fables for our times. *American Psychologist, 40,* 419-512.

Schaie, K. W. (1965). A general model for the study of developmental problems. *Psychological Bulletin, 64,* 92-107.

Seligman, M.E.P. (1975). *Helplessness: On depression, development, and death.* San Francisco: Freeman.

Sigel, I. E. (1985). *Parental belief systems: The psychological consequences for children.* Hillsdale, NJ: Lawrence Erlbaum.

Sigel, I. E. (1990). *Parental belief systems: Consequences for children's development.* Hillsdale, NJ: Lawrence Erlbaum.

Skinner, E. A. (1990). Development and perceived control: A dynamic model of action in context. In M. Gunnar & L. A. Sroufe (Eds.), *Minnesota symposium on child psychology* (Vol. 22, pp. 167-216). Minneapolis: University of Minnesota Press.

Skinner, E. A., & Wellborn, J. G. (in press). Coping during childhood and adolescence: A motivational perspective. In M. Perlmutter, D. L. Featherman, & R. M. Lerner (Eds.), *Life-span development and behavior* (Vol. 12). New York: Academic Press.

Skinner, E. A., & Belmont, M. J. (1990, April). *A longitudinal study of motivation in school: Reciprocal effects of teacher behavior and student engagement.* Paper presented at the annual meetings of the American Educational Research Association, Boston.

Stern, W. (1930). *Psychologie der frühen Kindheit bis zum sechsten Lebensjahre* (6th ed.). Leipzig: Quelle & Meyer.

Stewart, A. J., & Healy, J. M. (1989). Linking individual development and social changes. *American Psychologist, 44,* 30-42.

Strayer, F. F., & Noel, J. M. (1986). The prosocial and antisocial functions of preschool aggression: An ethological study of triadic conflict among young children. In C. Zahn-Waxler, E. M. Cummings, & R. Ianotti (Eds.), *Altruism and aggression: Biological and social origins* (pp. 107-131). New York: Cambridge University Press.

Sugarman, L. (1986). *Life-span development: Concepts, theories and interventions.* London: Methuen.

Valsiner, J. (1984). Construction of the zone of proximal development (ZPD) in adult-child joint actions: The socialization of meals. In B. Rogoff & J. V. Wertsch (Eds.), *Children's learning in the "zone of proximal development": New directions for child development* (pp. 65-76). San Francisco: Jossey-Bass.

Valsiner, J. (1987). *Culture and the development of children's action.* Chichester, UK: John Wiley.

Valsiner, J., & Mackie, C. (1985). Canalization of climbing skills through culturally organized physical environments. In T. Gaerling & J. Valsiner (Eds.), *Children within environments: Toward a psychology of accident prevention* (pp. 165-192). New York: Plenum.

Valsiner, J., & van der Veer, R. (in press). The encoding of distance: The concept of the "zone of proximal development" and its interpretations. In R. R. Cocking & K. A. Renninger (Eds.), *The development and meaning of psychological distance.* Hillsdale, NJ: Lawrence Erlbaum.

Vygotsky, L. S. (1978). *Mind in society.* Cambridge, MA: Harvard University Press.

Whiting, B. B. (1980). Culture and social behavior: A model for the development of social behavior. *Ethos, 8,* 95-116.

Wohlwill, J. F. (1983). Physical and social environment as factors in development. In D. Magnusson & V. L. Allen (Eds.), *Human development: An interactional perspective* (pp. 111-129). New York: Academic Press.

Yarrow, L. J., Rubenstein, J. L., & Pedersen, F. A. (1975). *Infant and environment: Early cognitive and motivational development.* New York: John Wiley.

COMMENTARY ON CHAPTER 6:

Modeling Environmental Development: Some Comments From a Developmental Task Perspective

MARCEL A. G. VAN AKEN

The relation between the development of individuals and their environment has been the subject of study and discussion for quite some time. In their chapter, Kindermann and Skinner describe different models of how individual and contextual change can be studied, either separately or in conjunction with each other. In a short overview of current models in the study of human development, the authors describe four recent changes in developmental psychologists' thinking about the effects of context on individual development.

First, they direct attention to an increasing complexity in dimensions and levels that are relevant in human development. The authors suggest that this increasing complexity led psychologists to draw on disciplines such as history and sociology in order to find a multidisciplinary approach. One of the goals of their chapter is described as examining the coordination of multiple levels of contextual influences into manageable research programs.

The second recent change is an increasing interest in explanatory (theory-based) models of environment, which raises new questions concerning components and processes of mutual effects between persons and environment.

The third change mentioned in the chapter is the increase toward "personalization" of the environment: an active role of the environment that is especially relevant in the case of the social context (as opposed to the physical context).