The Social Role of the Child in Ecological Perspective*

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Die soziale Rolle des Kindes in ökologischer Perspektive*


Abstract: The role of the child in society is examined as a function of stability and change in the ecological environment. The latter is conceived as including not only the immediate settings containing the developing person but also the larger contexts, both formal and informal, in which these settings are embedded. In terms of method, the approach emphasizes the use of rigorously designed experiments, both naturalistic and contrived, beginning in the early stages of the research process. The changing relation between person and environment is conceived in systems terms. These systems properties are set forth in a series of propositions, each illustrated by concrete research examples.

The theme of our seminar is “The Social Role of the Child”. My task in this first meeting is to spell out what this concept implies, and, thereby, to map the territory that we shall be exploring the rest of the week. In preparing for our seminar, I discovered that there is more in those few words than meets the eye. As with a young bud on the tree, not until it is open, the protective leaflets unfolded, does one discover the intricate design within, patterns that prefigure not only structure but process. This evening I invite you to join me in a similar experience. Our as yet unopened bud is the tightly packed seminar theme. And as we exfoliate the pithy phrase — “The Social Role of the Child” — we shall discover that it, too, prefigures process as well as pattern.

As with the newly-opened bud, at first glance we see only the obvious and familiar. I apologize in advance for boring you at the outset with much that you have seen before. But be patient — the simple will soon become complex, and the familiar strange. At least, I found it so. If you do not, I shall be reassured, and come to you for clarification.

The last word of our theme “child” seems simple enough — a younger member of the species Homo sapiens. But the clarity is short-lived. Witness the first part of the title — “social role”. According to our elementary texts, both European and American, a social role comprises “the behaviors and expectations associated with a particular position in society”. Our situation has become more complex. We now have to deal not only with the child, but also with “behavior”, “expectations”, “society”, and “positions” within it, not to mention the most mischievous and ungainly element in the definition — “associated with”. For example, our elementary texts go on to point out that the behaviors and expectations “associated with” a particular position in society are not limited to that position. It seems that every role is reciprocal; it involves not only the expectation and behavior of A toward B, but of B toward A as well. In fact, the terminology of roles implies as much; the role of mother implies the existence of a child; a teacher must have students, etc. Then, too, note that the reciprocal orientation takes place simultaneously in two domains — the objective field of behavior occurring in the world of reality, and the phenomenological field of expectation, existing only in the mind.

Moreover, in addition to these contemporaneous relations of thought and action in social space, roles are structured along yet another dimension not even mentioned in the definition — that of time. And time is no simple matter either. We are

fortunate to have as a member of our seminar an expert on the subject. Professor KURT LÜSCHER has published a fascinating essay on the sociology of time. In it he calls to our attention that there is more than one kind of time. To begin with, there is chronological time, the kind you measure by clock or calendar. Chronological time is relevant for us because a given role does not remain the same as time passes. There are historical changes. As Professor LÜSCHER and several other members of our seminar have documented, the role of the child is not the same today as it was a hundred years ago, or — in my country — even ten years ago. Thus what some researchers have referred to as “cohort analysis” applies not only to populations of children but also to the role that children play, and, thereby, to the work of our seminar.

Then there is a related but different form of time that has special significance in childhood — what we may call developmental time. The role of the child, and hence the roles of others toward children, change as the child matures. Expectations and associated behaviors are modified, sometimes radically, as the child grows older.

But both chronological and maturational changes are events in the real world. In keeping with the two-dimensional definition of role, time also exists in the phenomenological field. Indeed, that is what “expectancy” is all about; it refers to the anticipation, inside peoples’ heads, regarding behavior to take place at some point in the future. It may be in the very near, the immediate future, such as the expectation that a child will obey a parent’s request or a teacher’s instructions. Or, the behavior in question may not be expected to occur until much later — indeed, not until the child becomes an adult.

These aspirations for the future are also part of the present social role of the child, especially since they typically generate immediate expectations in the here and now; for example, parental desires, or even demands, that the child acts in certain ways today, acquires certain habits and skills regarded as necessary, in order to be able to function in a particular manner in the more distant future. In other words, the existence in the phenomenological field of long-range expectations, which we may call the goals of childhood, has consequences for events in the objective world, both now and at a much later time. For it may well be that the long-range expectations are in fact achieved, another example for the operation of perhaps the only immutable law in our science: “Situations perceived as real are real in their consequences.”

Finally, having dealt, at least the first time around, with behavior, expectations, and, even touched upon “associated with”, we have yet to consider the final and fundamental component in the definition of role: “position in society”. This component stipulates an additional condition for every role; namely, a role is defined not only by its internal structure, but also by its location in a larger social context. We therefore need to understand the nature of this encompassing environment.

To accelerate our task, I shall discuss this external structure as it relates specifically to the child and his role. Before turning to this topic, however, I wish first to summarize the implications of what has been said thus far for our evolving cognitive map — and the perspectives it delineates for the work of our seminar.

1. To begin with the inevitable, we shall in every case have to concern ourselves with how children in a given society are expected to act, how others are expected to act toward them, and how both children and others in fact behave in relation to these expectations.

2. We shall also inescapably have to deal with the fact that expectations and behaviors associated with children vary at different points in history and at differing ages of the child. Indeed, we may choose to focus on such temporal changes as a major theme for the seminar.

3. We shall also have to cope with the existence of long-range expectations for the child, as contrasted with immediate ones. How much emphasis we shall place on these perceived goals of childhood remains to be decided.

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We now pass from our first topic of the evening, the definition of role, to the second — the definition of the environment. I prefer, of course, to call this subject by another name some of you will recognize — the ecology of childhood.
Your smiles prompt me to an apology, a warning, and an acknowledgment. Many of you are familiar with material I have written on the topic. From you, I beg indulgence to the extent that I repeat myself. But I must also alert you to the fact that some new elements have been added, and others changed, of course for the better. To counteract the boredom induced by having to hear many of the same things again, I invite you to see if you can detect the innovations.

That brings me to the acknowledgement, for the new additions represent, in part, reactions to criticism and comments from some of you here present.

Here we go:

The structure of the ecological environment of the child is conceived topologically as a nested arrangement of structures, each contained within the next. For the purpose of describing these successive levels, we shall employ a terminology adapted from BRIM (1975).

1. A micro-system is the complex of relations between the developing person and environment in an immediate setting containing that person (e.g., home, school, work place, etc.). A setting is defined as a place with particular physical features in which the participants engage in particular activities with particular objects in particular roles (e.g., daughter, parent, teacher, employee, etc.) for particular periods of time. The factors of place, time, participants, activity, and role constitute the elements of a setting.

2. The meso-system comprises the interrelations among the major settings containing the developing person at a particular point in his or her life. Thus, for an American twelve-year-old, the meso-system typically encompasses interactions among family, school, peer group, and television; for some children, it might include as well church, camp, or work place, although the last would be less common in the United States than in some other societies. In sum, stated succinctly, the meso-system is the system of micro-systems.

3. The exo-system is an extension of the meso-system embracing other, specific social structures, both formal and informal, that impinge upon or encompass the immediate settings containing the developing person and thereby influence, delimit, or even determine what goes on there. These structures include the major institutions of the society, both deliberately structured and spontaneously evolving, as they operate at a concrete, local level. They encompass, among others, the world of work, the neighborhood, mass media, agencies of government (local, state, and national), the distribution of goods and services, communication and transportation facilities, and informal social networks.

4. Macro-systems. These structures differ in a fundamental way from the preceding forms. Specifically, each of the latter is, in PARSONS’ terminology, particularistic — that is, the micro-, meso-, exo-systems are the particular places, organizations, and institutions relevant to the particular individual in whose development we are interested. Here is the child’s home, there his day care center, down the road the shop where his father works, still further out is the hospital and a public park, the local post office, gas station, department store, political party headquarters, and the income tax bureau. But other cities have all these same institutions, and they all function in the same way. They even look similar, provided you stay in the same country. Once you cross the border, they look a little different, and they operate differently. But so long as you remain in the same culture, or subculture, they’re all pretty much alike. It’s as if they all had been made from the same blueprints.

These blueprints are the macro-system. Some of them are actually printed on paper specified in law statutes, regulations, and formal documents. But most macro-systems are informal and implicit — carried, often unwittingly in the minds of society’s members in the form of ideology and manifestated through practice and custom in everyday life. To give a formal definition:

4a) Macro-systems. These refer to the overarching institutions of the culture or subculture, such as the economic, social, educational, legal, and political systems, of which local micro, meso, and exo-systems are the concrete manifestations. Macro-systems are conceived and examined not only in structural terms but as carriers of information and ideology that, both explicitly and implicitly, endow meaning and motivation to particular agencies, social networks, roles, activities,
and their interrelations. What place or priority children, and those responsible for their care, have in such macro-systems, is of especial importance in determining how a child and his caretakers are treated and interact with each other in different types of settings.

Especially in its formal properties, the foregoing conception of the environment, as well as the dynamic relation between person and situation implied in the definition of the ecology of human development, draws heavily on the theories of KURT LEWIN (1935, 1936, 1948, 1951). Indeed, this paper may be viewed as an attempt to provide psychological and sociological substance to LEWIN’s brilliantly conceived topological territories.

Given so complex a conception of the environment, the question arises how its various components can be operationalized and examined for purposes of systematic empirical research. This question brings us to the principal methodological thesis of the present exposition; namely, that the strategy of choice for investigating the ecology of human development, from the earliest stages of research forward, is an ecological experiment, defined as follows:

An ecological experiment is an effort to investigate the progressive accommodation between the growing human organism and its environment through a systematic contrast between two or more environmental systems or their structural components, with a careful attempt to take into account possibly confounding factors, either by random assignment (contrived experiment) or by matching (experiment of nature).

I deliberately eschew the term typically employed in the research literature of “quasi-experiment”, because it suggests a lower level of methodological rigor, an implication I regard as unwarranted on strictly scientific grounds. As I shall endeavor to show, there are instances in which a design exploiting an experiment of nature provides a more critical contrast, insures greater objectivity, permits more precise and theoretically significant inferences — in short, is more elegant and constitutes “harder” science than the best possible contrived experiment addressed to the same research question.

In other respects, of course, the definition has a familiar ring. In keeping with the commitment to rigor affirmed at the outset, the main body of the definition is a restatement of the basic logic of the experimental method. What may be challenged about this formulation is not the procedure advocated but the timing and the target of its application.

Specifically, I am proposing that experiments can be employed in the very first phases of scientific inquiry, not for the usual objective of testing hypotheses (although this device is used as a means to an end) but for heuristic purposes; namely, to analyze systematically the nature of the existing accommodation between the person and the surrounding milieu.

The need for early experimentation derives from the nature of the problem under investigation. The “accommodation” or “fit” between person and environment is not an easy phenomenon to recognize. Here looking is usually not enough. As GOETHE wrote with his poet’s prescience: “Was ist das Schwerste von allem? Was dir das Leichteste dünkt: Mit den Augen zu sehen, was vor den Augen dir liegt.” (What is the most difficult of all? That which seems to you the easiest, to see with one’s eyes what is lying before them.)

If looking is not enough, what is one to do? How can the observer quicken his sensitivity to the critical features of the observed? The answer to this question was given me a quarter of a century ago, long before I was ready to appreciate it, by my first mentor in graduate school, WALTER FENNO DEARBORN. In his quiet, crisp New England accent, he once remarked: “Bronfenbrenner, if you want to understand something, try to change it.” And whether one studies change by deliberately altering conditions in a contrived experiment or by systematically exploiting an “experiment of nature”, the scientific purpose and effect are the same: to maximize one’s sensitivity to phenomena through the juxtaposition of the similar but different constitutes the core of the experimental method and creates its magnifying power.

But the strategy of experimentation has an even more important advantage that makes its early application critical for research in the ecology of human development. To adapt DEARBORN’s
dictum to this domain: if you wish to understand the relation between the developing person and some aspect of his environment, try to budge the one, and see what happens to the other. Implicit in this injunction is the recognition that the relation between person and environment has the properties of a system with a momentum of its own; the only way to discover the nature of this inertia and its interdependencies is to try to disturb the existing balance.

It is from this perspective that the primary purpose of the ecological experiment becomes not hypothesis-testing but discovery — the identification of those systems-properties and processes that affect, and are affected by, the behavior and development of the human being. Since the environment as here conceived encompasses both immediate and larger social contexts, the experimental design cannot be simplistic; it is necessarily complex. And, in keeping with its heuristic function, it must fulfill more than the usual and essential requirement of controlling for possibly confounding factors. It must perform the more scientifically fruitful task of providing a highly differentiated and thereby sensitive grid that make possible detection of differences and changes in the state and structure of ecological systems.

This brings us to the final and most challenging requirement of a theoretical model for research in the ecology of human development; namely, environmental structures, and the processes taking place within and between them, must be viewed as interdependent and analyzed in systems terms. The specification of these interdependencies constitutes the main task of the proposed approach. The main body of the paper, which follows, constitutes a beginning effort in this direction in the form of a series of propositions outlining the requirements of an ecological model for research at each of the four successive levels stipulated in the conceptual framework of the environment. Each position is accompanied by one or more examples of concrete investigations — actual when available, hypothetical when not — to illustrate the given requirement, either by demonstration or default.

The reference to illustration by default reflects the fact that, for reasons already indicated, well-designed, ecological experiments are, as yet, not easy to find. In an effort to alter this state of affairs, the author was fortunate in enlisting the support of the Foundation for Child Development in initiating a small-scale program of research grants and career development awards in the ecology of human development. The aim of the program is to encourage scientific work and training in the systematic study of “the behavior and development of children, and those who care for them, in the enduring environments in which they live”. A number of ecological experiments cited below were supported by grants from the FCD program.

Properties of the Micro-System

Reciprocity

It is a sign of some progress that the first systems-property to which we call attention is one that many readers will recognize and applaud. In the classical psychological research model, whether in the laboratory or in the field, there were, and often still are, only two parties — an experimenter, identified solely, and apparently still acceptably, as E; and, another person equally informatively described as S — the subject. The term “subject” is apt, for it reflects the fact that, with few exceptions, the process operating between E and S has been viewed as unidirectional; the experimenter presents the stimulus, and the subject gives the response. Nowadays, we all know that the process goes both ways. In more formal terms:

Proposition 1. In contrast to the conventional, unidirectional model typically employed in the laboratory, an ecological experiment must allow for reciprocal processes; that is, not only the effect of A on B, but also the effect of B on A. This is the requirement of reciprocity.

While the thesis that most behavior in social situations is reciprocal is generally accepted in principle, it is often disregarded in practice. As a

1 Information about the program may be obtained by writing to: Joyce Brainard, Administrative Aide, Program on the Ecology of Human Development, Department of Human Development and Family Studies, Cornell University, Ithaca, New York 14853.
The reported results of these experiments strain the credulity of the reader. One month after the brief extended contact at birth, the mothers in the experimental group were more attentive and affectionate toward their babies and more solicitous about their welfare (KLAUS et al. 1972). Not only were these differences still in evidence at the end of the first year, but two years later the mothers, in speaking to their children, used significantly more questions, adjectives, words per proposition, and fewer commands and content words than did the control mothers.

Finally, the most recent experiment in the series (HALES 1977) not only provides a much-needed replication of the initial studies in a larger sample (n = 60), but does so in a different cultural context (Guatemala) and with a more rigorous experimental design that permits pinning down the heretofore unresolved issue of whether there exists a critical period of susceptibility to extended contact between mother and infant. HALES clarified this issue by introducing two early contact groups, one limited to 45 minutes immediately after delivery, and the second for an equal interval but beginning 12 hours after the infant’s birth. The results were unequivocal. Only the mothers in the immediate contact group were affected.

Recognizing the functional social system

From an ecological perspective, even more remarkable than the dramatic results reported in this series of experiments are the data they omit. In none of the papers cited is there a single word about the behavior of the infant, and all of the experimental effects are attributed entirely to the mother. Thus the investigators refer repeatedly to a “maternal sensitive period” or a special attachment period existing in the human mother” (KLAUS et al. 1972: 463; KENNElL et al. 1974: 173). The principle of reciprocity, of course, raises the question of whether the distinctive behavior of the mothers in the experimental group might not have occurred, at least in part, as a response to a sequence of activities initiated by the developing infant, and reciprocated by the mother in a progressively evolving pattern of social interaction. Regrettably, the possibility remains unexplored. In keeping with the classical experimental model, the focus of scientific attention in these studies was limited to the subjects of the research, who, in this instance, were not the children but the mothers. The omission is all the more striking given the fact that the infants were not only always present in the research situation, but all of the mother’s behavior being observed was directed toward them.

Taken as a whole, this series of experiments on the effects of early, extended mother-infant contact provides an excellent illustration of several defining properties of an ecological research model, both by demonstration and default. On the one hand, the work constitutes a clear instance of ecologically valid experimentation focused directly on developmental processes. Moreover, it presents an example par excellence of how experimental intervention can bring to light critical features of an ecological process hardly likely to be identified through straightforward naturalistic observation in the unaltered existing setting. On the other hand, the research represents a striking case of failure to take into account the total social system actually functioning in the given situation.

This dramatic lacuna in an otherwise impressive series of studies gives rise to our next proposition.
Proposition 2. An ecological experiment requires recognition of the social system actually operative in the research setting. This system will typically involve all the participants present, not excluding the experimenter. This is the requirement of recognizing the totality of the functional social system in the setting.

This proposition becomes increasingly important as we move on to a consideration of systems involving more than two persons.

Beyond the dyad

The Western Reserve experiments reflect the influence of the traditional laboratory paradigm in still one other respect; they are limited to a two-person model.

As previously noted, the classical psychological experiment allows for only two participants: E and S. Even in those researches that take into account the activities of more than two persons in differing roles, the behavior of each is usually analyzed separately and interpreted as an independent effect. As a case in point, we may consider recent work on father-infant interaction\(^2\). Much of this research treats the behavior of the father, and any reaction it may evoke in the child, exclusively in class-theoretical terms as attributable entirely to the father without regard to the possibility that both the father's action and the child's responses may be influenced by the mother — her presence or absence, and the possible effect of her behavior on the interaction of the father with the child. We refer to this kind of indirect influence as a second-order effect. To state the issue in propositional form:

Proposition 3. In contrast to the conventional dyadic research model, which is limited to assessing the direct effect of two agents on each other, the design of an ecological experiment must take into account the existence in the setting of systems that include more than two persons (N + 2 systems). Such larger systems must be analyzed in terms of all possible subsystems (i.e., dyads, triads, etc.), and the potential second- and higher-order effects associated with them.

It will be observed that this proposition represents, in effect, an extension and further specification of Proposition 2 as applied to a system involving more than two persons. To illustrate the application of the principle, we turn to three recent studies of parent-child interaction that, explicitly or implicitly, employed a three-person model. PARKE (1976) and his co-workers observed both parents with their newborns in a hospital setting to determine what effect each parent had on the other's interactions with the infant. In each case, the presence of the spouse significantly altered the behavior of the other parent, specifically, both father and mother expressed more positive affect (smiling) toward their infant and showed a negative level of expectation when the other parent was present . . . These results indicate that parent-infant interaction patterns are modified by the presence of another adult; in turn, the implication is that we have assumed prematurely that parent-infant interaction can be understood by our sole focus on the parent-infant dyad alone (pp. 33–34).

Support for PARKE's conclusion comes from a study by PEDERSON (1976) in which the second order effect is somewhat more remote, but equally if not more consequential. This investigator examined the influence of the husband-wife relationship (assessed through interview) on mother-infant interaction in a feeding context (as observed in the home.) His results are summarized as follows:

The husband-wife relationship was linked to the mother-infant unit. When the father was supportive of the mother . . . she was more effective in feeding the baby . . . High tension and conflict in the marriage was associated with more inept feeding on the part of the mother (p. 6).

PEDERSON also found that the developmental status of the infant, as measured on the BRAZELTON scale, was inversely related to the degree of tension and conflict in the marriage. Consistent with our Proposition 1, he notes appropriately that the causal direction could go both ways\(^3\).

PEDERSON's results indicate that this second-order effect can have inhibitory as well as facilitative impact. Indeed, LAMB (1976c) suggests,

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\(^2\) For a comprehensive review of this literature, see LAMB 1975a, 1976a.

\(^3\) The reciprocal interaction between the marital and the parent-child dyad in a three-person system is demonstrated even more dramatically in HETHERINGTON's (1976) comparative study of divorced vs. two-parent families.
on the basis of experimental findings, that as the infant gets older (i.e., 18 months) the presence of the second parent may reduce rather than increase parent-child interaction. The experiment, however, was carried out in the laboratory, and, as a number of comparative studies have shown (including one by LAMB — see below), both parents and children behave rather differently in laboratory vs. real life situations (BELSKY 1976, LAMB 1975b; ROSS et al. 1975; SCHLIEPER 1975; SHALOCK 1956); hence it would be important to replicate LAMB’s experiment in a home setting.

When interpreted in an ecological perspective, however, the results of laboratory research provide an important complement to experiments carried out in real-life environments. For example, if viewed for what is almost invariably for a young child, namely, a “strange situation” (AINSWORTH and BELL 1970), the laboratory dramatically reveals the role of the parent as a source of security for the child and, in terms of a three-person model, as a catalyst for the child’s interaction with the environment, including other, unfamiliar persons. Thus, in all the strange situation experiments, the mother’s presence in the laboratory reduces the child’s anxiety and resistance to the “stranger”. Indeed, especially when the experiments are carried out in the home (e.g., LAMB 1975b, 1976b), infants in the company of their parents look and smile at the stranger more often than at their mothers.

The mother-father-child triad is of course not the only three-person system of developmental importance within a family. Other common combinations include two siblings and a parent; parent, child, and grandparent, aunt, or uncle, etc. The author has been able to find only one study of the effect of the impending arrival of a second child on the parental treatment of the first, that done by a prescient leader in the field over a quarter of a century ago (BALDWIN 1947). Other triadic combinations in the family apparently remain wholly unexplored and hence constitute a promising ecological domain for developmental research.

The application of a three-person model to a developmental context outside the home is likewise a rarity. There does exist one elegant study, however, documenting a second-order effect, in a classroom setting. SEAVER (1973) ingeniously exploited an “experiment of nature” to investigate the controversial phenomenon of induced teacher expectancies (ROSENTHAL and JACOBSON 1968). SEAVER examined differences in the academic achievement of elementary school pupils with older siblings who had had the same teacher and performed either exceptionally well or exceptionally poorly. Children taught by teachers who had not instructed the older siblings served as controls. In contrast to earlier studies, which had produced inconsistent, weak, or questionable effects, the results of SEAVER’s natural experiment gave substantial support to the teacher expectancy hypothesis. As SEAVER himself acknowledges, however, it is not clear who was the mediator of the observed effect. Were the teacher’s expectations changed because of her prior experience with the older sibling, or did the younger sibling evoke a different response from the teacher because of expectations created by the older sibling, or by the parents, based on their previous acquaintance with the teacher, or both? The remaining ambiguity in interpretation testifies to the importance of analyzing subsystems and higher-order effects as stipulated in Proposition 3.

The involvement of parents as intermediaries in a process already involving two siblings and a teacher would of course escalate the system from a triad to a quintet, or, more generally, an N + 3 system. To this author’s knowledge, no studies utilizing such a model have been carried out within a single setting despite the fact that the modal American family with two parents and two children constitutes a readily available example. The wide prevalence of this structure raises the question of the optimal size and form of systems for fostering human development.

The evidence cited above suggests that, as one moves from a dyad to a triad, the resulting structure may offer possibilities for greater stability, mutual assistance, complementarity, spelling each other off, and reinforcement both directly, and indirectly through third parties. Although the power of an N + 3 system within a single context, like the home or school, remains unknown, the paradigm can be applied to some researches that have been carried out in multiple settings. Before turning to a consideration of this topic, however, we must take note of yet another source of higher-order effects.
The indirect impact of physical factors

Environmental influences on development are of course not limited to human beings. However, in keeping with the classic two-element research model, these influences are usually thought of as acting directly on the subject; the possibility of higher-order effects operating indirectly has been overlooked. We cite two examples:

The first is provided by an elegant ecological study of the influence of apartment noise on human development (COHEN, GLASS, & SINGER 1973). The investigators found that children living on the lower floors of 32-story buildings near noisy traffic showed greater impairment of auditory discrimination and reading achievement than a matched sample living in higher-floor apartments. COHEN et al. viewed their study as a real-life counterpart to laboratory experiments demonstrating degradation of task performance as a direct after-effect of exposure to noise. The two situations are not analogous, however, since the real-life setting included other persons besides the children who were selected as the subjects of the study. Moreover, these other persons — the child’s parents and other members of the family — were also exposed to traffic noise and, in all likelihood, affected by it. If so, the possibility remains that the impairment of the child’s auditory discrimination and verbal skills might have come about not only as a function of his own difficulties in hearing or sustaining attention in a noisy environment, but also because others around him were similarly affected, engaged him less frequently in conversations, reading aloud, or correction of the child’s verbal utterances. No data are available to demonstrate or disconfirm the existence of such a second-order effect, but relevant information could have readily been obtained had the other participants in the setting been included in the research design.

Similar considerations apply to research on the effects of television. Almost all investigations in this area have been concerned with the direct impact of the programs viewed by the child on his or her knowledge, attitudes, and behavior; indirect influences through the modification of patterns of family life have scarcely been mentioned, yet alone investigated. In a review of research literature bearing on this issue, GARBARINO (1975) was able to identify only one investigation that dealt with the question explicitly and systematically. In a field survey, MACCOBY (1951) found that 78% of the respondents indicated no conversation occurred during viewing, except at specified times such as commercials, and 60% reported that no activity was engaged in while watching. On the basis of her findings, MACCOBY concluded:

The television atmosphere in most households in one of quiet absorption on the part of family members who are present. The nature of the family social life during a program could be described as “parallel” rather than interactive, and the set does seem quite clearly to dominate family life when it is on (1951: 428).

It is noteworthy that MACCOBY’s study was published a quarter of a century ago and no further research has been done on the problem since that time. With the rapid growth of television, and the television culture, in the intervening years, the impact of the medium on family life has, in all probability, become both more pervasive and profound. The question of how any resultant change in family patterns has, in turn, affected the behavior and development of children (i.e., the second-order effect) remains completely unexplored.

These and related studies lead to the following proposition:

Proposition 5. Ecological experiments must take into account aspects of the physical environment as possible indirect influences on social processes taking place within the setting.

We have now concluded analyses of systems-properties in the immediate setting containing the person, and now proceed to consideration of multiple contexts.

The Meso-system: Relations Between Settings

While human beings have been studied in a variety of environments, there are few investigations in

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4 Although the rapid growth in recent years in environmental psychology (e.g., PROSHANSKY et al., 1970; MOOS, 1976) has led to a proliferation of studies on the impact of physical factors on behavior, little of this research has focused on indirect effects of these factors on the behavior of those who, in turn, influence the course of someone else’s development.
which the behavior and development of the same persons have been examined as a function of their exposure to different settings⁵. Thus we usually carry out our researches either in the laboratory, or the home, or the classroom, but seldom in more than one context simultaneously. From a theoretical viewpoint, we may note here a continuity of the traditional research paradigm, now across domains; the restricted two-person system at the level of the individual becomes an analogous person-in-single-context model at the level of settings. Once a second setting is introduced, the system becomes triadic (so far as the subject is concerned), and thus allows for the possibility of second-order effects, now across settings. Such theoretical enrichment generates an array of new and provocative research questions. Not only does it necessarily introduce a comparative perspective, but it also calls attention to the importance of investigating joint effects and interactions between settings (for example, home and school, family and children’s peer group, the peer group and the school, etc.), and thereby highlights the possibility that events in one milieu may influence the child’s behavior and development in another. Thus the experience of a child in day care, in the classroom, or the informal peer group, may change his pattern of activities and interaction with parents or siblings in the home, or vice versa, with consequent implications for learning and development.

Interactions Between Settings

In order to examine the joint effects of exposure to more than one setting, an ecological research model must have certain additional properties, which we present in the next series of propositions. We begin with a general principle that outlines the range of phenomena that the research model must encompass.

**Proposition 6.** In the traditional research model, behavior and development are investigated in one setting at a time without regard to possible inter-

⁵ The work of BARKER, SCHOGGEN, WRIGHT, and their colleagues (BARKER & GUMP 1964; BARKER & WRIGHT 1954) represents a notable exception, although in their research settings are conceived and analyzed almost exclusively in behavioral terms with only incidental reference to their social-structural properties.

dependencies between settings. An ecological approach invites consideration of the joint impact of two or more settings or their elements. This is the requirement, where more than one setting occurs, of analyzing interactions between settings.

We take, as our initial examples, the two earliest shifts in setting that a human being typically experiences in modern societies, first the temporary separation of the newborn from the mother to the hospital nursery, and then the move from the hospital to full-time maternal care in the home. A study by SCARR-SALAPATEK and WILLIAMS (1973) examined the effects of an experimental intervention in the experience of babies born prematurely to mothers from severely deprived socioeconomic backgrounds.

Infants were assigned consecutively to the experimental or control group as they entered the premature nursery. In the first phase of the study, conducted in the hospital, the babies in the control group received standard pediatrics as there are for low-birth-weight infants. For infants in the experimental group,

the nursery staff . . . were instructed before the study began to provide special visual, tactile, and kinesthetic stimulation that approximated good home conditions for normal newborns. The practical nurses rocked, talked to, fondled, and patted the infants during feedings in which they were held in the nursing position and could regard the nurses’ faces. (p. 97)

As soon as the infant was discharged from the hospital, the second phase of the experimental treatment was initiated through a series of weekly visits to the home over a period of two years by a “child guidance social worker”, who talked with the mother or other principal caretaker.

Although initial measures of maternal health and neonate developmental status had favored the control group, the experimental infants showed significantly greater weight gains and, by one year, an average difference of nearly 10 IQ points separated the two groups. The mean score for the infant in the experimental treatment was 95 thus bringing them “to nearly normal levels of development” (p. 99), truly a remarkable achievement for a low-birth-weight sample from so deprived a socioeconomic background.

Although this important experiment does docu-
ment the joint effects of experience in two different settings, hospital and home, the design does not permit a definitive assessment of the independent contributions of each, since there were no comparison groups receiving the home or hospital treatment only. Nevertheless, the research illuminates, both by demonstration and default, some of the parameters required of an ecological model appropriate for analyzing developmental processes for the same children in more than one setting. To begin with, we observe that the existence of two locales (i.e., hospital and home) necessarily involves the child in an N + 2 system that extends across both settings instead of being limited to one. Thus, in the case at hand, there are participants in four different roles with the infant appearing in both settings; the nurse only at the hospital; and mother and social worker primarily in the home. This four-person structure permits a variety of possible subsystems and high-order effects, both within and across settings. Unfortunately, in keeping with the traditional research model, the measures obtained focused almost exclusively on the experimental subjects — i.e., the infants — and were confined to test scores in the bargain. Thus no systematic data were collected about the infant’s immediate response to the stimulation as it was provided, nor about the participants’ interactions with and perceptions of each other. Here and there are tantalizing fragments of information suggesting that certain patterns of response and relationship were central to the developmental processes that were taking place. For example:

Previously skeptical nurses (and investigators) were amazed to see 3-pound infants gazing at the brightly colored, patterned birds [suspended above their heads] . . . The infants were observed to gaze at the faces of the nurses who fed them and to respond socially to handling and voices by quieting when distressed . . . Most mothers . . . were interested in the social worker’s help, not only for their children but for themselves. They sought her advice and aid on many practical details of life . . . and in personal problems (e.g., troubles with men, mothers, siblings; feelings of depression). (pp. 99–100)

The mothers in the experimental treatment were also very cooperative. Despite frequent moves, only one child was lost to the research from this group, compared to six from the control sample. Even though several of the experimental children were cared for by foster mothers for part of the year, the mothers assisted the social worker in ar-

ranging for continuation of the home visits with the new caretaker. “In no case was the home visitor excluded from an infant’s home” (p. 98). Such continuity and cooperation are hardly typical in research with families from the lowest SES group, and testify to a strong involvement by the mothers in their premature infants and in the program of home visits designed to foster the children’s development.

Taken together, the foregoing bits of information suggest that, within the four-person system produced by the experimental treatment, certain subsystems became especially strong, namely, nurse-infant; social worker-mother; mother-infant, and perhaps mother-infant-social worker, the last involving the second-order effect of the home visitor on the interaction of the mother with her child. Another second-order effect, in this case across both time and space, appears highly likely for the influence on the mother-infant dyad of the infants’ involvement in the clearly reciprocal relationship developed earlier with the nurses at the hospital, a pattern reminiscent of the attachment between the newborn and the mother described in the Western Reserve experiments summarized above (pp. 6–7).

In fact, one wonders what could have happened had the mothers in the experimental group been provided with opportunities for “extended contact” of the type afforded to mothers of premature in the previously cited study by KLAUS et al. (1970). Perhaps, following this experience, the mothers would not have been so “unable and unwilling” to come to the hospital. Or, failing that, suppose the researchers had made use of the apparently tripod subsystem of nurse-social worker-mother by having the social worker begin her visits as soon as the mother returned home after delivery, and report to her the nurse’s enthusiastic descriptions of her premature baby’s surprisingly “mature” responses to stimulation of the kind normally provided to full-term infants at home?

We mention these possibilities primarily not for their relevance to the experiment under discussion (which constitutes a substantial scientific contribution in its present form) but as a concrete illustration of our next general proposition, which represents an extension of Propositon 3 beyond a single setting.
Proposition 7. The design of an ecological experiment involving the same person in more than one setting should take into account the possible subsystems, and associated high-order effects, that could exist across settings.

Ecological Transition

The study by SCARR-SALAPATEK and WILLIAMS also provides an example of a fundamental paradigm for ecological research at the level of the meso-system focusing on the successive shifts from one ecological context to another that every person undergoes throughout the life span. A number of such changes have served as an object of investigation in the researches we have already examined. To recall but a few: a mother is presented with her newborn infant for the first time (KLAUS et al.) the baby returns home from the hospital (SCARR-SALAPATEK & WILLIAMS), or the child is promoted to the next grade in school (SEAVER). It is not difficult to think of other situations along the same line: the arrival of a sibling; entering a day care center; the move from preschool to school; getting a new teacher; going to camp; graduations; “dropping out”; finding one’s first job; changing jobs; losing a job; marriage; becoming pregnant; having relatives or friends move in (and out again); buying one’s first family TV set, car, or home; vacations; travel; moving; divorce; remarriage; changing careers; emigrating; or to return to the more universal — becoming sick; going to the hospital; getting well again; returning to work; and — the final experience to which there are no exceptions — death.

Systems-properties of ecological transitions

We call attention to this varied array of events in everyday life not for their personal but their scientific significance. For each one constitutes, in effect, a ready-made experiment of nature with a built-in, before-after design in which each subject serves as his own control. Moreover, these ecological transitions are sufficiently diverse to involve every one of the settings and systems-properties set forth in our seven propositions thus far. To begin with, they all take place in real-life settings. In terms of the elements of the setting, they entail changes over time in role, activity, and often place as well (wife to mother, child at home to pupil at school, student to worker, etc.). The magnitude of the micro-system expands and contracts with marriages, births, graduations, divorces, and deaths. Reciprocal processes, second- and higher-order effects are the rule, since a developmental change in the state and status of one member of the system invariably alters the relations between the others. Since almost every transition involves more than one setting, these interactive processes occur not only within but also across setting boundaries, thus involving interactions within higher-order systems. For example, when a child enters day care, the pattern of family activities changes; a divorce can alter the child’s behavior in the classroom; dropping out of school has reverberations in the family; and a new job in another town affects home, school, and every other environment of developmental significance.

Finally, ecological transitions provide a framework for dealing with developmental changes throughout the life span. The almost exclusive focus of past research (particularly in developmental psychology), on the properties of the individual with little reference to context has generated a curiously broken trajectory of knowledge that has a brave beginning, sad ending, and an empty middle. Given a theoretical perspective in which development is seen as instigated and paced primarily by events within the organism — that is, by biological change — the outcome is a segmented science that abounds with information about the early years, grows less informative through middle childhood and adolescence, and then becomes virtually silent for decades, until the organism begins to decline, when there is once again a spurt of scientific activity. To be sure, a number of events in the life cycle discussed above have been the objects of scientific study. But such investigations have seldom been planned and conducted for the explicit purpose of assessing the impact of the experience upon processes of development. And even when this aim has been pursued, the research design has typically been cross-sectional rather than longitudinal (as, for example, in most studies of home vs. day care). As a result, the inquiry can shed little light on the transition as a developmental experience. Also, whether cross-sectional or longitudinal, studies to date, as already noted, have focused almost exclusively on one class of persons designated as the experimental subjects. The impact of an ecological transition not merely on the developing person but on the
enduring systems of which he is a part (e.g., family, peer group, etc.) remains an unexplored and scientifically promising terrain for ecological research in human development. It is this new domain that is addressed in our next proposition. In contrast to its predecessors, which spoke mainly to theory and method, this proposition deals with substance and scope.

Proposition 8. A fruitful context for developmental research is provided by the ecological transitions that typically occur in a person's life. These transitions include changes in role and setting as a function of the person's maturation or of events in the life cycle of others responsible for his or her care and development. Such transitions are to be conceived and analyzed as changes in ecological systems rather than solely within individuals. Developmental transitions are not limited to the early years but recur, in various forms, throughout the life of the learner. Hence the experimental ecology of human development must incorporate a life-span perspective if it is to do justice to the phenomena within its purview.

The Exo-system: Developmental Setting in Context

Thus far we have dealt only with the immediate settings containing the developing person and the relations between them. We now move to more remote regions in considering the impact on these immediate settings of the external contexts in which they are embedded. Such exo-systems are both formal and informal: examples include the nature and requirements of the parents' work, characteristics of the neighborhood, health and welfare services, government agencies, the relations between school and community, informal social networks, transportation systems, law enforcement practices, shopping facilities, means of communication, patterns of recreation and social life, and a host of other ecological circumstances and events that determine with whom and how people spend their time; for example, the fragmentation of the extended family, the separation of residential and business areas, the breakdown of social networks, the disappearance of neighborhoods, zoning ordinances, geographic and social mobility, growth of single-parent families, the abolition of the apprentice system, consolidated schools, commuting, the working mother, the delegation of child care to specialists and others outside the home, urban renewal, or the existence and character of an explicit national policy on children and families. In sum, here in the third circle of our ecological model are whole subcontinents waiting for scientific exploration — waiting because, to date, there have been few investigations of exo-system effects on developmental processes. We are truly in terra incognita so far as systematic research is concerned.

One might challenge this assertion on the grounds that studies of social class differences provide a massive body of information about the impact of the larger environment on development. Such studies are certainly relevant, but they fail to meet a basic requirement of our ecological model; namely, in developmental research, social class is usually treated as a linear variable rather than conceptualized in systems-terms (for example, in terms of the social network in which a person is a participant).

The properties of the research model for investigating relations at the level of the exo-system are precisely those that have been specified in our prior propositions; the only difference is that these stipulations are now applied to settings and systems beyond the immediate situation containing the developing person and have impact on that immediate situation. In other words, exo-systems represent sources of higher-order effects from more remote regions of the environment.

Accordingly, exo-systems do not generate any new functional principles; their place and purpose in our theoretical schema is essentially heuristic: to alert researchers to aspects of the larger environment that may be critical for the process of making human beings human. It is this heuristic function that is embodied in our next proposition.

Proposition 9. Research on the ecology of human development requires investigations that go beyond the immediate setting containing the person to examine the larger contexts, both formal and informal, that affect events within the immediate setting.

As already indicated, examples that meet the foregoing criteria are difficult to come by. We have been able to discover only a few correla-
tional findings and fragmentary facts, and offer three instances:

In a study of child neglect among low income families, GIOVANNONI and BILLINGSLEY (1970) sought to identify the environmental circumstances associated with the parents’ treatment of the child. Among other conditions (such as inadequate housing and absence of a telephone), differentiating factors included the existence of a functional kinship network, as well as church attendance. In summing up their findings, the authors concluded as follows:

Among low-income people, neglect would seem to be a social problem that is as much a manifestation of social and community conditions as it is of any individual parent’s pathology. (p. 204)

Corroborative data on a broader scale come from a correlational analysis of child abuse reports and socioeconomic and demographic information for the 58 counties of New York State (GARBARINO 1976). In the investigator’s words, “a substantial proportion of the variance in rates of child abuse/maltreatment among New York State counties (three samples) was found to be associated with the degree to which mothers do not possess adequate support systems for parenting and are subjected to economic stress” (p. 185).

The fragmentary fact appears in the previously cited experiment of SCARR-SALAPATEK and WILLIAMS (1973) on the effects of early stimulation on premature infants. What were the long range effects of their highly successful intervention? The sobering answer to this query appears in the following statement at the conclusion of their report:

A longer-term follow-up infant development in the E group would be very desirable to see if initial gains were maintained through the second year. Unfortunately, the shortage of federal funds has closed the High Risk Clinic so that pediatric care and psychometric evaluation are no longer available to the low-birth-weight group. (p. 100)

This depressing statement escalates us to the highest level of our ecological model, the macrosystem of institutions and associated ideologies that permeate the society as a whole.

Experimenting with the Macro-system

To formulate our final proposition, we take cognizance of yet another delimiting characteristic of conventional research on human development. The foreshortened perspective was first brought to my attention by Professor A. N. LEONTIEV of the University of Moscow. At the time, a decade ago, I was an exchange scientist at the Institute of Psychology. We had been discussing differences in the assumptions underlying research on human development in the Soviet Union and in the United States. In summing up his views, Professor LEONTIEV offered the following judgement: “It seems to me that American researchers are constantly seeking to explain how the child came to be what he is; we in the U.S.S.R. are striving to discover not how the child came to be what he is, but how he can become what he not yet is.”

The Transforming Experiment

LEONTIEV’s statement is of course reminiscent of DEARBORN’S injunction (“If you want to understand something, try to change it”), but goes much farther; indeed, in LEONTIEV’s view, it is revolutionary in its implications. Soviet psychologists often speak of what they call the “prebrazuyuschchi eksperiment”, the “transforming experiment”. By this term they mean an experiment that radically restructures the environment, producing a new configuration that activates previously unrealized behavioral potentialities of the subject. Russian developmental psychologists have indeed been ingenious in devising clever experiments that evoked new patterns of response primarily in the sphere of psychomotor and perceptual development (COLE & MALTZMAN 1969). But once Soviet research moves out of the laboratory, the control group disappears, systematic data yield place to anecdotal accounts, and the “transforming experiment” degenerates into a dutiful demonstration of ideologically prescribed processes and outcomes.

For rather different reasons, “transforming experiments” in the real world are equally rare in American research on human development. As LEONTIEV implied, most of our scientific ventures into social reality perpetuate the status quo; to the extent that we include ecological contexts in our research, we select and treat them as
sociological givens rather than as evolving social systems susceptible to significant and novel transformation. Thus we study social class differences in development, ethnic differences, rural-urban differences — or, at the next down, children from one- vs. two-parent homes, large vs. small families — as if the nature of these structures, and their developmental consequences, were eternally fixed and unalterable, except, perhaps, by violent revolution. We are loath to experiment with new social forms as contexts for realizing human potential. "After all", we say, "you can’t change human nature". This precept underlies our national stance on social policy, and much of our science in human development as well.

It is obvious that the discussion is now no longer confined to settings and social structures on the local scene. We have moved from the mundane micro- and meso-structures of a particular community to the level of macro-systems — the institutions, and their associated ideologies — that pervade major segments of the society or the culture as a whole. The implications of this shift for an ecological research model concern the nature of the contrast to be employed in our experiments. It is one thing to compare the effects on development of systems or system elements already present within the culture; it is quite another to introduce experimental changes that represent a restructuring of established institutional forms and values.

With these unorthodox thoughts, we arrive at the last and most demanding of our propositions defining the nature and scope of ecological experiments.

**Proposition 10.** Research on the ecology of human development requires experiments involving the innovative restructuring of prevailing ecological systems in ways that depart from existing institutional ideologies and structures by redefining goals, roles, and activities, and providing interconnections between systems previously isolated from each other.

Precisely for the reasons outlined above, it is not easy to cite examples of experiments that satisfy the requirements of Proposition 10. But in selecting illustrations for earlier principles, we sought to bear this last proposition in mind as well. The researches of KLAUS and of SCARR-SALAPATEK and WILLIAMS represent cases in point. Instead of examining alternative modes of transition already available in our society, these investigators introduced unorthodox innovations. The former violated established hospital practice by allowing mothers to have immediate and extended contract with their newborn infants. The latter, in effect, presumed to treat prematures from severely deprived low income families as if they were full-term offspring from middle class homes.

Examples of equally radical environmental transformations for children at older age levels are even more difficult to find. One thinks of the controversial experiment of SKEELS (1966), who removed children diagnosed as mentally retarded from an orphanage and placed them in the care of mentally retarded adult females in a hospital ward. The children exhibited marked increases in IQ, were subsequently adopted, and ultimately led productive lives as adult workers and family members. An experiment with similar beginnings is described by HEBER et al. (1977), although follow up data after the children’s entry into school are yet to be reported. Perhaps the best example for a “transforming” ecological experiment published to date is that of SHERIF. In his “Robbers Cave Experiment”, SHERIF and his colleagues (1961) were able, within the space of a few weeks, to produce radical changes in the behavior of a group of middle class eleven-year-old boys involved in an experimental camp. By altering the structure of activities and social organization they first evoked high levels of aggression bordering on sadism, and then transformed the same boys into friendly, cooperative altruistic citizens. The objective set is best epitomized by the classic statement of VINCE LOMBARDI, coach of the world-champion Green Bay Packers: “Winning isn’t everything; it’s the only thing”. Hatred was transformed into harmony by a strategy referred to by SHERIF as “pursuit of a superordinate goal”. For example, the water supply to the camp was turned off and a call went out for volunteers to find an alleged leak in the mile-long water line.

While “transforming” experiments are scarce in the published literature, ideas for ecological innovations for American society that could be carried out within the framework of a systematic research design are not difficult to come by. To cite a few examples:
1. Introduce a “curriculum for caring” in the schools, in which students under supervision provide substitute care for children of working mothers, assist families in emergencies, visit the old, sick, and lonely, etc. Existing curriculum variations could provide ready-made controls.

2. Facilitate the transition of children from home to school by acquainting family members and school personnel with each other and engaging them in joint activities in both school and home settings, as well as on “neutral ground”, a year or more before the child enters school.

3. Expand contemporary experiments on income maintenance (e.g., WATTS et al 1974) to include assessment not only of the family’s economic behavior but parent-child activities and relations as well.

4. Induce a business enterprise to introduce flexible work schedules for families with children, enabling the parents to be at home when youngsters return from school, fall ill, etc.

My purpose in presenting the foregoing proposals is not to advocate their implementation, but, as with the essay as a whole, to stimulate new, ecological directions of thought and activity in developmental research. In keeping with this objective, I conclude with an entreaty to love, honor, and perhaps even to obey DEARBRON’s Dictum, LEONTIEV’s Law, and a new version of THOMAS’s Thesis: “Experiments created as real are real in their consequences”.

References


6 The original classic statement by THOMAS, one of the few propositions in social science approaching the status of an immutable law, reads as follows: “If men define situations as real, they are real in their consequences” (THOMAS & THOMAS 1928: 572).


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