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9. How is development conceptualized in mother-child interaction research?

Abstract

The history of research on mother-child interaction reflects that developmental issues remain of central importance. This chapter offers an account of the different conceptualizations of development that are utilized in the noninteractive, unidirectional, bidirectional, and systemic perspectives on mother-child interaction. The majority of interaction research turns out to be nondevelopmental in nature. Suggestions are provided to elaborate the perspectives by including developmental change in the models. We discuss what can be gained from such a developmental approach.

Introduction

The history of research on mother-child interaction reflects that developmental issues remain a central but far from resolved topic - both conceptually and empirically (Parke & Tinsley, 1987). Addressing developmental questions developmentally remains a challenge for the study of socialization. This chapter offers an account of the different conceptualizations of development that are utilized in the parent-child research literature. To accomplish this goal, the plethora of research studies focusing on parent-child relationships have to be organized. There are several possible routes toward integration, e.g., theory-based, variable-oriented, or structure-oriented. An integration based on theoretical frames of reference is difficult, because the discrepancy among researchers' conceptualizations is considerable and often the theoretical base is not articulated. A variable-orientation, on the other hand, carries the danger of fragmentation. Following others (Peterson & Rollins, 1988; Sigel, 1983; Stafford & Bayer, 1993), a structural typology is employed, which provides a heuristic by which to identify the research perspective and by which most studies in the field can be classified. Broadly categorized, there are four different views about 'who affects whom' in the parent-child dyad and family system. These four views are labelled *noninteractive, unidirectional, bidirectional*, and *systemic*. In this chapter we will illustrate if and how developmental change is examined within each framework.

Definitions

Given our focus on the concept of development in interactions, we must explain what we mean by *interaction* and *development.* In addition, we introduce a set of codes to represent the models underlying the different perspectives on interaction. Following Rosenthal (1973), we view interaction as essentially involving 'the changing pattern of mutual perceptions and behaviors of both infant and care-

taker vis-à-vis each other as a result of their respective previous mutual perceptions and behaviors vis-à-vis each other' (p.302). It basically means not only *C*'s reactions to *I*, but also the effects of these reactions on *I*'s later output and the effect of that output on *C*, etc.. This definition encompasses not only the content and quality of the interaction, but also the patterning of the behavior of the interactive partners with respect to each other. A number of types of interactions between two individuals on successive occasions over time constitute a relationship (Hinde & Stevenson-Hinde, 1987).

A developmental orientation on mother-child interaction is aimed at the descriptive and explanatory study of constancy and change in interactive behavior. Baltes and Nesselroade (1979) distinguish strong from weak conceptions of development. In a strong developmental orientation chronological age is considered only indirectly relevant in the process of identifying change, as is the case in dynamic systems modeling for example (Fogel, this volume). To be able to include as many perspectives on mother-child interaction as possible a weak developmental orientation is adopted referring to age-related changes in interactive behavior.

The following set of codes is used to represent the models underlying the interactional approaches. Entities are represented as: M = Mother; C = Child; D = dyad. The following code subscripts refer to qualities or characteristics: t = trait or perception or behavior; v = change. Variables are represented by means of characters, for instance: A = age; B = Background variables (e.g., sex, education). Relational codes are: ← = a function of; * = combined with; | = given or conditional on.The codes allow easy comparison of the models underlying the different approaches. Moreover, the models represented by means of these codes can be easily examined with regard to developmental change. In the next sections we will describe how development is examined in the identified approaches on mother-child interaction.

The noninteractive approach

In the noninteractive approach parental attitudes and belief systems are examined given hypothetical or observable behavior of the child. Parents' characteristics are assessed relative to their children's development, but the child is not actually involved. In this perspective two kinds of studies are being conducted; inquiries in which parental responses to hypothetical vignettes are generated, and studies consisting of parents' responses to observed child behavior or to information obtained about a child.

An example of the first kind of research is that of Harwood and Miller (1991) consisting of middle- and lower-class Anglo-American and lower-income Puerto Rican mothers' responses to three hypothetical 18-month-old toddlers portrayed as displaying secure, anxious-avoidant, or anxious-resistant patterns of behavior. Mothers in both cultural groups differed in their evaluations of insecure attachment behavior. Anglo mothers rated the anxious-resistant infants as less desirable than the Puerto Rican mothers, because they valued self-confidence and autonomy. Although reliable parent data are generated in this way, no information is obtained about the significance of such parental characteristics. Questions about

the validity of parental responses arise from two issues: (a) the extent to which parents are reflective about their own behavior and that of their children, and (b) the extent to which they are knowledgeable about or aware of the types of cognitions which mediate their behavior.

In the second kind of study the child's behavior is the independent variable and the perceived response of the parent is the dependent variable. Examples are studies in which parents may observe a child's behavior or obtain information about a child and are asked to produce attributions regarding their child's behavior. For instance, in a study by Hess and McDevitt (1986) parents had information about their child's performance in mathematics and attributed explanations or predictions of how and why the child did what he or she did. Other examples are studies in which the effects of child characteristics on parents' attitudinal attributions are the focus of study. Findings by Dix and Grusec (1985), Hewstone (1983), and Miller (1986) demonstrate that parent's attributions may vary as a function of the type of child behavior being explained, for example, positive versus negative behavior.

Studies initiated from the noninteractive approach can be summarized as:

$$M_t \mid C_t, B$$

The mother's perceptions (M_t) are examined given the characteristics of the child (C_t) and background variables (B). In sum, in noninteractive interaction research the parent's state of mind is identified given the characteristics of the child. Such data do not indicate whether in actual behavioral or social interactive terms these factors produce differences that make a difference. Age differences are not included in the model. If age is incorporated in the design, it is used as a background variable. Age-based comparisons alone, however, provide little information about what sorts of processes are actually at work producing the observed changes. Hence, the process character of development is disregarded.

The unidirectional approach

In the unidirectional approach, the socialization process is generally defined as one in which the influence flows from adults to children. This type of inquiry emphasizes a behavioral orientation and the focus of research is on parent behaviors as they impact the child's competence. The basic argument is that parents' attitudes, beliefs, attributions, etc. are expressed in parental behaviors. Three alternatives can be identified and will be described below.

A host of studies examined the relation between a variety of parental affective, instructional or management behaviors and any one of a number of child outcome measures. Using demographic variables such as age, sex, educational level and the like as statistical controls, many of these inquiries reported low but positive correlations between what the parent does and child outcomes (for reviews see Maccoby & Martin, 1983; Martin, 1975; Peterson & Rollins, 1988). For example, studies with infants focused on the parent's style of communication as the independent measure, with the infant's rate of vocabulary production as the dependent measure. Akthar, Dunham, and Dunham (1991) reported that children of mothers

with a directive or intrusive style had a relatively slow rate of vocabulary production compared to the children of mothers with a more suggestive and responsive style.

In this same genre, studies have been reported where infants' behavior is the independent variable, with parent reactions as the dependent measures. This alternative is in fact a reversal of the traditional one-way process from parent to child. Bell (1968; Bell & Harper, 1977) has pointed out that any association observed between child-rearing style and child outcome may reflect reverse causality, whereby children shape the child-rearing styles of their parents. In an experimental study by Anderson, Lytton, and Romney (1986), for instance, conduct-disordered boys were paired both with mothers of conduct-disordered sons and with mothers of normal sons; and then normal boys were paired with the same two groups of mothers. In this way mother effects could be separated from child effects and any statistical interaction between the two could also be tested. It was found that conduct-disordered boys elicited negative parenting practices even from the parents of the normal boys. Hence, it seemed that the characteristics of the child, more than of the mother, drove the type of parenting behavior displayed in the experimental setting.

A more complex unidirectional alternative is one in which the investigator moves beyond the simple independent-dependent framework to a quasi-bidirectional view incorporating more than just parent behavior. In this case parent beliefs are hypothesized as influencing parent behavior which in turn influences child behaviors. There are three mutually dependent components in the model: parental beliefs regarding the child's development, parental interactive behaviors, and child outcomes. Each component can be affected directly or indirectly by each of the other components. Parents' interactive strategies, for example, influence the child's behavior - a direct influence - and the child's behavior can influence the parents' interactive behavior - another instance of a direct influence. Parents' beliefs influence their way of interacting, *but* the way children respond to parents' interactive strategies may influence not only the interactive strategies, but also parents' beliefs about their children. This is an indirect effect (Sigel, 1986).

The three models in the unidirectional approach can be designated as:

(1)	C_t	$\leftarrow$	$M_t \mid B$
(2)	M_t	$\leftarrow$	$C_t \mid B$
(3)	M_t	$\leftarrow$	$M_{t'}$
	C_t	$\leftarrow$	M_t
	$M_{t'}$	$\leftarrow$	C_t

The first two models can be represented by one equation, while the third model consists of a set of three equations. The first model indicates that the child's behavior (C_t) is affected by some kind of child-rearing behavior of the mother (M_t). It is assumed that the effect may differ depending on the background variables (B). In the second model the path of influence is reversed. Finally, the third model is a combination of the first two models with parental beliefs ($M_{t'}$) acting as an intervening variable.

In research initiated from a unidirectional perspective, age is often used as a design variable, that is, the temporal order of the measurements is fixed by design. In the area of the socialization of conduct disor-

dered children, for example, the use of temporal priority in measuring parent and child behavior can be shown to cause misleading interpretations. If parental (lack of) control is measured prior to acting-out behavior of the child and the two variables are found to correlate highly, a likely interpretation of the findings would be that parental permissiveness leads to aggression in the child. However, an interpretation that hot-headed behavior of a child makes mothers back off from very strict control of aggressive behavior sounds equally plausible, but is not likely to be used with data from a design where parental behavior is measured prior to child behavior. Nevertheless, several lines of experimental research have confirmed the correctness of the latter interpretation, namely, that the effect runs from child to mother (e.g. Barkley & Cunningham, 1979; Brunk & Henggeler, 1984). Hence, the use of age as a design variable may create the wrong impression that in actual fact one behavior is antecedent to another behavior. The concept of development advocated in this perspective is one that is essentially technological in nature, that is, data are collected in the service of prediction. The role of single variables in individual development is often gauged by how well they predict later outcomes.
So far, the overwhelming preponderance of empirical studies initiated from a unidirectional stance has contributed to identifying operating factors in the interaction, while the number of studies contributing to identifying mechanisms by which such factors work is very few. The research is also limited by an almost exclusive reliance upon linear relations that presume that more of a good thing, such as parental warmth and responsiveness, is always in the best interest of the child (Belsky, 1990). The fact that there may be a point of diminishing returns is suggested by a few studies that document curvilinear relations between indices of the parent-child relationship and child development (e.g., Roberts, 1986; Roberts & Strayer, 1987; Van den Boom & Hoeksma, 1994). Although several studies did address the issue of mother-child interaction longitudinally (e.g., Belsky, Rovine, & Taylor, 1984; Bornstein & Tamis-LeMonda, 1990; Crockenberg & McCluskey, 1986; Pettit & Bates, 1984), developmental change was not examined. On the contrary, statistical strategies are often used to detect lack of change. The models presented above make this abundantly clear. It is interesting to note, however, that the third model is implicitly bidirectional. This can be seen, when the three equations are combined:

$$M_{t'} \leftarrow C_t \leftarrow M_t \leftarrow M_{t'}$$

The combination of equations leads to the expression that the mother (M_t) affects the child and the child (C_t) affects the mother, that is, the mother adjusts her own beliefs about the child's behavior ($M_{t'}$) based on the interaction with the child. This brings us to the next approach which is truly bidirectional in nature.

The bidirectional approach

In the bidirectional perspective those parent behaviors are examined that elicit a response from the child and where the parent's subsequent response is contingent on the child's actions. Each unit of behavior of one of the participants in the interaction is contingent, in temporal

terms, on the behavior of the other. Whereas in the independent-dependent paradigm the interaction is portrayed as static, in the bidirectional approach mutual engagement is considered to be important while the temporal factor is broadened. In this approach the flow of socialization influences occurs in both directions in the parent-child relationship.

Studies using precise microanalyses of interactive behavior between parents and children (e.g., Brazelton, Koslowski, & Main, 1974; Lewis & Lee-Painter, 1974) are examples of this kind of research. Another way to analyze reciprocity, is concerned with the conditional probability of events (Bakeman & Brown, 1977; Martin, Maccoby, Baran, & Jacklin, 1981). In this case, the probability of occurrence of a selected behavior by one person (the actor) is calculated, given the prior occurrence of a selected behavior of the other person (the partner). This probability of occurrence is then compared with the actor's baseline for the behavior of concern, that is, the probability that this action will occur whether or not the partner's behavior has occurred. A key assumption of this approach is that an initial behavior or a pair of behaviors is always responsible for the occurrence of the following behavior. Further advances in the study of reciprocal interaction include the development of lag sequential analysis (Sacket, 1979) and log-linear modeling (Van Beek, De Roos, Hoeksma & Hopkins, 1992). In this case, sequential patterns of behavior are examined without the assumption that a particular behavior is always a function of the behavior that immediately precedes it. That is, probabilities of occurrence can be calculated for behaviors between actor and partner coming later in a sequence than immediately after a criterion behavior. Investigators of bidirectional interaction have suggested that simultaneous as well as sequentially occurring behavior between parent and child require empirical attention. Other data analytic techniques suited for continuous measurements involve the application of multiple regression to sequential data (Martin et al., 1981; Thomas & Martin, 1976) and time series analysis (Gottman & Ringland, 1981; Hoeksma & Koomen, 1991). Comparable to the lag sequential method, in these methods both the actor's prior behavior and the partner's behavior are entered as joint predictors of the actor's current behavior. These procedures provide estimates of the independent effects of self-behavior, the partner's behavior, and their interaction.

Some mother-infant interaction research is bidirectional, but in a more implicit way. Studies focusing on dyadic interaction qualities, e.g., sensitive responsiveness or mutual engagement, are examples. Although such qualitative measures of maternal caregiving are usually portrayed as parental childrearing dimensions, they are in essence dyadic measures that reflect the functioning of the pair, because instructions accompanying such ratings do not prohibit raters from considering the child's behavioral response to the mother's intervention. Thus, in assessing whether a mother's behavior is responsive, raters may take into consideration such positive responses as a decrease in crying or an immediate compliance to a maternal request (Schneider Rosen & Rothbaum, 1993). Although such assessments do not yield any information about the process or pattern of interaction, they approximate the notion of 'interaction' by providing us with a

measure that involves simultaneously both parties in the exchange. Hence, research focusing on dyadic interaction qualities is conceptually linked with the bidirectional perspective, but the research methodologies used are not in accord with this approach.

A more recent development in the bidirectional perspective is the dynamical systems alternative. In developmental psychology this approach was introduced by Thelen and Smith (1994) and Van Geert (1994) and has been mainly applied to the area of motor behavior, but hardly to the domain of social interactive behavior (Van Geert, this volume). The basic idea is that behavior can best be modeled as a sequence of ordered stable states. Input to the system continually destabalizes the present stable state and necessitates convergence to a new form of behavior (Thelen & Ulrich, 1991). In contrast to the statistical models discussed so far dynamic models are strictly deterministic. The dynamic system involves observable behavior compressed into a collective variable. The overall strategy proposed by dynamic systems researchers consists of identifying the collective variable and its attractor states as they change over time in order to discover what the control variables are which engender shifts (Bogartz, 1994). Fogel and Thelen (1987) and Fogel (1993, this volume) offer a perspective on early expressive and communicative action and relationships from a dynamic systems perspective. In this view dynamic systems are presented as a metaphor for interactive behavior. However, the model still awaits empirical application. In a critical evaluation Bogartz (1994) points out that it is not enough to simply assert that all individual subject variability is lawful and of interest and should not be dismissed as error. The requirement is to show that the variability does arise out of an orderly deterministic process. It seems very unlikely that in the case of social interactive behavior it will be possible to study pure process without error.

Bidirectional models can be represented as follows:

$$\begin{array}{lcll} M_t & \leftarrow & C_t & \\ & & & \mid A, B \\ C_t & \leftarrow & M_t & \end{array}$$

The behavior of the child (C_t) affects the mother and the behavior of the mother (M_t) affects the child during ongoing interaction given age (A) and background variables (B) of mother and child. The models are nondevelopmental in nature, because age-related changes are not examined. Much of the existing work on bidirectionality has been limited to the infancy period. That later periods of development have been neglected is probably due to the fact that as children grow older, parent-child interaction may be less a function of events occurring in immediately preceding time intervals and more a function of events that are remembered and are responded to over longer periods of time. Bidirectional research has been mainly occupied with a descriptive orientation and various methodological issues without developing theoretical concepts that provide insight into the nature, the antecedents, and the consequences of bidirectional interaction. The bidirectional perspective represents the idea that a meaningful investigation of infant-mother interaction ought to focus on the analysis of the changing patterns of interaction flow proper, rather than on the correlation between infant and paren-

tal variations. Therefore, the research is often limited to one interacting unit at the time with change studied mostly within and not across interactions. The main problem in this approach is how to relate the results of the models at different ages to each other. Nevertheless, this perspective created an increased awareness of the fact that interaction is something dyadic between two members, rather than the impact of one *on* the other.

The systemic approach

The alternatives described to this point focused on the parent-child dyad as the unit of analysis. The systemic approach emphasizes the interdependence of relationships within the family. Issues related to etiology and direction of cause and effect with regard to child consequences are considered to be of less importance than for scholars working from a unidirectional view. With their emphasis on mutual influence, systems alternatives reflect inclusions and extensions of the bidirectional view, that is, the socialization process is not only conceived of as bidirectional, but as multidirectional. In this chapter we only include those alternatives that focus on the empirical inquiry of relationships. Due to the problem of translating systems models in manageable research, only two approaches seem most germane to parent-child interaction: the interpersonal relationships perspective of Hinde, and the (bio)ecological perspectives of Bronfenbrenner and Belsky.

The alternative that is most closely tied to mother-child interaction is the interpersonal relationships perspective (Hinde & Stevenson-Hinde, 1987). By considering the possibility that one family relationship can influence another family relationship (in contrast to the effect of one individual on another individual), systemic effects are incorporated. Hence, the traditionally studied mother-child interaction is highly salient. It is considered to be only one of many relationships. In this systems alternative child consequences have been stressed more than in other systems views. The interactional and relational aspect is considered to be the most important feature of context. In addition, relationships and interactions are assumed to be impinged on by social norms, the sociocultural structure, and other aspects of society. Two-way cause-effect influences are postulated between the characteristics of individuals and interactions, between interactions and relationships, and between interactions/relationships and the larger environmental context. That mother-child interaction and the family context are intricately intertwined is evident from the findings of Radke-Yarrow, Richters, and Wilson (1988). Only in families categorized as 'stable', higher rates of initial child compliance were related to more positive mother-child relationships, whereas maternal use of harsh enforcement was associated with more negative mother-child relationships only in 'chaotic' families. Such data illustrate environment-behavior interactions. Bronfenbrenner and Ceci (1994) use a more expanded view of the context in which development occurs. The context is conceptualized very broadly, that is, parent-child interaction is conceived of as being influenced by the interaction of genetics and environment in families, and transitions and linkages between the family and other major settings (e.g., day care, peer groups, the school, parental job

environments, public policies). Despite the fact that there is a great deal of interest in extrafamilial environmental factors, the ultimate goal is still the investigation of the consequences for the child.

Belsky, Rovine, and Fish (1989) provide a systems approach that can be applied empirically. The family is conceived of in terms of multiple levels of analysis. It consists of elements that together constitute subsystems, and that like the elements are reciprocally interrelated, comprising an entity that is not reducible to the sum of its parts. In terms of the family, individuals are the basic elements, relationships are the core subsystems, and there exist interrelations of individuals (i.e., elements) and relationships (i.e., subsystems). Such a perspective demands attention to adults as well as to children, to marital as well as to parent-child relationships, and to the triadic family system in addition to parent-infant and spousal dyads. In addition, three major influences on parenting are postulated: background and resources of the parents; the individual characteristics of the child; and the stress and support the parents experience from the extended system. Belsky, Youngblade, Rovine, and Volling's (1991) inquiry is one of the few studies that actually examines systemic assumptions. In this observation-based and longitudinal study it was found, for example, that as men's marital satisfaction declined, they interacted more negatively with their children. Husbands experiencing secure marriages, on the other hand, expressed more positive affect in interaction with their children. Children of fathers with a negative marital experience also interacted more negatively with their fathers. Child negativity may further contribute to the father's unhappiness in the marriage. Contrawise, women who became unhappy in their marriages did not manifest this change in interaction style with their children. Actually such wives became more positive and supportive of the child. The systemic issues raised by this study are several. For instance, do positive bonds between mothers and children contribute to fathers' feelings of loss of love, thus reducing involvement with children? Or does the mother-child relationship develop in response to fathers' negative behavior? Does the mother strive to buffer the child from the father's negativity? Would this type of subsystem coalition be unhealthy for the child in the long run? Although systems research is expanding, the number of empirical studies has been quite sparse.

Although there are numerous systemic models, we will represent only one. The important point to be noted is that the model shows that there is no direct influence from mother-to-child or vice versa. Instead there is an influence from one relationship to another and vice versa. The systemic model can be represented as follows:

$$
\begin{aligned}
D &\leftarrow M_t * C_t \\
D' &\leftarrow M_t * O_t \\
D &\leftarrow D'
\end{aligned}
$$

The dyad (D) is influenced by the combined behavior of the mother and the child. However, in a family system the mother is also a member of (an)other dyad(s) (D'), for instance, with the father or another child (represented by O_t in the equation). And it is assumed that the latter relationship(s) affect(s) the first one. Developmental change is not incorporated in the model. Systemic approaches which have been in the family research

and family therapy literature for years have rarely been employed successfully among developmental psychologists. The shift from a dyadic unit to the family as the unit of analysis is major, because the complexity that confronts investigators increases enormously. By taking this complexity into account systemic models are, nevertheless, convincing conceptual representations of the socialization process. The (mathematical) models that are needed to test the multitude of influences in a family system are so complex, that they can hardly be tested. Although statistical advances are being made, such tools generally have cumbersome problems and complexities and still fail to capture the essence of the entire system (e.g., Kenny, 1988; Montgomery & Duck, 1991). Perhaps the best recommendation for researchers is to be realistically selective in the questions to be addressed. However, developmental issues must be brought into the research for the simple reason that characteristic interactions at one point in the child's development may be different from another. Moreover, family events such as conflict or parental separation may have different consequences at different times in the child's life (Hinde, & Stevenson-Hinde, 1988).

Rethinking development in mother-child interaction research

The above suggests that the majority of interaction research is nondevelopmental in nature, that is, in the majority of studies age-related changes are not examined. And indeed, the set of codes used to represent the different approaches shows that in none of the equations the code subscript 'v' - indicative of developmental change - is incorporated. Therefore, the question posed in the title of this chapter 'How is development conceptualized in mother-child interaction research?' cannot be answered properly given the present state of the art. A major limitation characterizing most of the research in the field is the lack of a conceptual developmental model (Sigel, 1983). Within each of the structural models a temporal factor must be built in.

The unidirectional approach can be elaborated to include developmental change by measuring all of the variables of interest on multiple occasions. Frequency of measurement should be attuned to the degree of change that can be expected in these variables of interest. Measuring parental and child interactive behavior longitudinally offers the possibility to examine how and why the relation between the two variables changes over time (Hoeksma, Van den Boom, Koomen & Koops, this volume). In addition, it offers the possibility to determine the direction of change. In other words, in the unidirectional approach formal statistical models are available that allow for a developmental orientation on the study of mother-child interaction.

Although the bidirectional approach implicitly represents the idea that interaction moves through time, developmental change is not incorporated in the models. Empirical investigations that deal with bidirectionality have several deficiencies requiring attention by future investigators. The development of theoretical concepts that provide insight into the nature, the antecedents, and the consequences of bidirectional interaction seems to be important. The focus on description, methodological issues, and the observation of behavior sequences resulted in insuffi-

cient attention to conceptualizations of mother-child interaction. Bidirectional interaction research requires theoretical concepts that can point to the relations among events that are important and that can provide guidelines for identifying and controlling irrelevant factors. Next, empirical findings are routinely referred back to the theory for its evaluation and modification. In a more theory-based orientation it would be possible to establish the meaning of the parameters that are estimated in the models at different ages. In those bidirectional studies where the interaction is studied at different ages, the biggest challenge is to relate the results of the analyses across interactions. Although the concepts that are central in dynamic systems models are strictly defined from a mathematical point of view, they are used in a very loose metaphorical sense in dynamic views on mother-child interaction. Therefore they are not very helpful in guiding empirical research. This vague guidance of metaphors must be replaced by formal theory and logical deduction of its consequences (Bogartz, 1994).

In contrast to the bidirectional approach, the systemic approach is much more theory driven. What is lacking, however, are data analytic techniques that allow for a test of the theoretical claims that are made. Although the concepts of systems theory are often used in ways that call into question its scientific utility, Belsky et al. (1989) present an approach on the family as a system that is more realistic with regard to application in empirical studies. Application of a systems approach in its full complexity to the empirical study of mother-child interaction does not seem to be warranted, however, at this point in time.

Our definition of the interaction argues for the recognition of three developmental trajectories--an infant developmental course, an adult one, and the interplay between these two provides a third developmental trajectory. The mother-child interaction may contribute to the child's development, but the child's development changes these same interactions. The child's greater autonomy forces renegotiation of the relationship with the parent. In addition, physiological and cognitive growth probably trigger certain relationship changes more or less directly. Other changes in the interaction between mother and child derive from the mother's own socialization, e.g., women who are at different stages of adult development bring different interpretive frameworks and social skills to their interactions with their children. However, relationships and their development are not reducible to a combination of the developmental changes occurring in the two individuals separately. Developmental change in relationships derives from sources both within the two individuals involved and between them (Hartup & Laursen, 1988). Despite the fact that such a conceptualization of the mother-child interaction reflects the thinking of many developmentalists in recent years, nondevelopmental concepts and the statistical procedures associated with them still dominate the field (Cairns, 1986). In order to become truly developmental, the field of mother-child interaction needs a move in the direction of greater complexity, both in concept and in method. The construction of a developmental conceptualization of the mother-child interactive process and the development of more complex, but testable analytical models, are the biggest challenges facing us in the

entire effort to study mother-child interaction in a truly developmental way.

Concluding comments

What can be gained from the effort to study mother-child interaction developmentally? One contribution of the developmental perspective is that it provides guides for what kinds of questions should be asked and for what sorts of research strategies should be employed. In addition, mother-child interaction research will become more person-oriented instead of variable-oriented, that is, insight will be gained in intraindividual patterns of change over time. Generalizations will be based on the identified commonalities across persons or across relationships. A developmental orientation also requires reflection on the way the variables are being measured. In mother-child interaction studies it is not unusual to use a single construct consisting of behaviors that differ markedly in quality and form, but that are presumed to share common functions at different ages. Examples of such constructs are aggression, and attachment. Although the use of such single nondevelopmental constructs may aid in identifying continuities, they may also obscure real developmental changes in the form and function of behaviors at different ages (Cairns, 1986). In order to be able to detect developmental change, the individual behaviors should be measured on multiple occasions over time. Finally, a developmental orientation on mother-child interaction could change our view of the sources of individual differences. Variability in outcome measures is well documented in any number of areas. Variability in process is less well understood. It means that children may reach similar outcomes by different pathways. A focus on developmental change can lead to the detection of such diverging or converging pathways. The analysis of developmental change in interactive behavior promises to be a major task for developmental psychology in the years to come.

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