Chapter 11

Conclusions and implications

Developmental determinism and indeterminism

Most relationships begin with a meeting, often by chance, of two individuals who are drawn to each other. According to psychologist Albert Bandura,

> A chance encounter is defined as an unintended meeting of persons unfamiliar to each other ... Some chance encounters touch people only lightly, others leave more lasting effects, and still others branch people into new trajectories of life ... The unforeseeability and branching power of fortuitous influences makes the specific course of lives neither easily predictable nor easily socially engineerable.[1]

Once a chance encounter occurs, however, the future course of events may be at least partially determined by the susceptibility of the individuals to each other and their openness to change. Within relationships there are processes that lead to the formation of stable consensual frames and those frames constitute a reduction in the degrees of freedom of individual action. Creativity and choice is possible, but within the circuit of the consensual frame. Thus, we may have historical determinism in particular epochs within the life course of an individual or a relationship. Alternatively, relationships may be partially indeterminate as they change by creative or fortuitous events that lead them into new stable frames, and indeterminacy arises in development as individuals enter relationships with others that begin either creatively or fortuitously.

In her biographical account of her own and her friend's lives, Mary Catherine Bateson discusses the use of chance opportunities and improvisation while living during a time when cultural frames for women's roles are changing. She describes her book as

> about life as an improvisatory art, about the ways we combine familiar and unfamiliar components in response to new situations, following an underlying grammar and evolving aesthetic ... A good meal, like a poem or a life, has a

> certain balance and diversity, a certain coherence and fit. As one learns to cope in the kitchen, one no longer duplicates whole meals but rather manipulates components and the way they are put together. The improvised meal will be different from the planned meal, and certainly riskier, but rich with the possibility of delicious surprise. Improvisation can be either a last resort or an established way of evoking creativity. Sometimes a pattern chosen by default can become a path of preference.[2]

There is an apparent paradox in describing developmental change as both partially predictable and determinant, and partially fortuitous and indeterminate. How can humans develop similar global characteristics, yet their daily lives are often shaped by chance events that make them different from each other?[3]

My answer to the question of the balance of indeterminism vs. determinism is conceptualized within the frame of a continuous process model of relationships. Rather than thinking of some actions and events as fortuitous and others as determined or predictable, I believe that virtually every action and event is partly determinate and partly indeterminate. Events are partially indeterminate in the sense that the information we create about them is always changing, and partially determinate in the sense that they are perceived as part of ongoing action within a frame that constrains our degrees of freedom.

Chance or caprice certainly occurs in development, as in suffering from a disease or having a serious accident. But research on adult life-course development has shown that fortuitous events, if they are to play a role in changing the developmental trajectory, must be assimilable by the individual, must be informative within some frame of reference. Bandura describes how chemistry Nobel Laureate Herbert Brown decided to undertake his doctoral dissertation in the relatively obscure area of boron hydrides.

> As a baccalaureate gift, his girlfriend presented him with a copy of the book, *The Hydrides of Boron and Silicon*, which launched his interest in the subject. This was during the Depression when money was scarce. She happened to select this particular chemistry book undesignedly, because it was the least expensive one available at the university bookstore. Had his girlfriend been a bit more affluent, Brown's research career would in all likelihood have taken a different route.[4]

Now, if my girlfriend at the time of my college graduation had presented me with a book on boron chemistry, it is highly unlikely that it would have affected my career trajectory.[5] The gift Brown received was an innovation whose relative determinacy for subsequent events in his life has to be understood within the frames in which the book became informative. The book was adopted into a *self frame* in which it had some perceived affinity. Brown was already interested in chemistry, and he and his girlfriend may have maintained a *consensual frame* in which chemistry was discussed. She bought the book at a university bookstore, one of the few places one could hope to find a specialized book on boron and silicon. In other words, the girlfriend appropriated part of a *cultural frame*

(the book and the bookstore) that she suspected would be co-regulated into their ongoing consensual frame (with gratitude perhaps and continued conversation about the topic) and possibly into Brown's self frame.

An innovation like a book can be rigidified as a dust collector on a shelf, it can be dissolved from the frame at the next textbook buy-back at the university bookstore, or it can be elaborated upon creatively. Brown's creative elaboration led to hundreds of his own articles and the creation of innovative consensual frames of research teams with students and colleagues, and innovative cultural frames of new concepts and new techniques adopted by other chemists. The examples I used in Chapter 2 – of Laura, of infant crying, and of runners – are essentially no different from this. They all show how innovations are incorporated into relationship frames and also how in the adoption process these innovations teeter between determinism and indeterminism, certainty and uncertainty.

Action is always partially determinate and partially indeterminate. Because the stability of a frame is created and dynamic, its future can never be entirely predicted from its past. Some frames indeed appear more stable and lasting than others, and to the extent that the frames are maintained by the creation of meaningful information by the participants they will have the appearance of a determined system. There are, however, no frames in life that cannot be altered or eliminated.

Self, communication and culture are inseparable. Self frames are inherently dialogical, between different action possibilities perceived in the present or between various imagined possibilities and positions. The action possibilities and imagined positions are modeled after our experience in relationship consensual frames and in relationship frames with non-animate features of the environment. Those frames are virtually always centered within cultural frames of beliefs, practices and tools. Cultural frames are embodied with respect to the perception and action possibilities of individual selves and are thus more easily taken up within self frames. There is no beginning and ending point in this dialogical system of relationships.

Dialogue is all there is. The dialogical process – in which actions and events are informative in relation to the history and current actions of the participants – occurs at all times within the self, between self and other, between self and environment, and between other selves that partake of the same culture. Life is a synergetic, multilayered process. An event that changes one's life direction is not a beginning, it is an innovation adopted into an existing nexus of self frames that are shaped by consensual and cultural frames.

Dialogue creates patterns that individuals can perceive as invariants within the flow of action. What I perceive as invariants within the dialogical process may not be the same as those detected by another individual. The theoretical model I have outlined here takes its particular shape in part from my perceptions of this process, in part from the actions I can execute as a scholar and writer, and in part from the cultural tools (the scientific literature, the

language, the print media, the static illustrations in two dimensions) by which a book can be informative. In a relationship, it is possible that each individual may have a different perception of what is creative and what is rigid, and each may derive a different meaning from the process.

Forms of information: morality, aesthetics and affiliation

Relationships develop via dual processes of innovation and dissolution, by making and breaking frames, and by engaging in both creative and rigid dialogues. In this book I have so far avoided placing value judgements on these processes. I have not spoken of relationships as good or bad, adaptive or maladaptive, self-affirming vs. self-destructive. These values are relative to how the dialogue is framed. I have attempted, instead, to provide a general model of relationship formation that can be applied to any kind of relationship process between any individuals, at any age, and in any species.

When one moves from the stance of observer of relationships to the stance of participant, that is, when one has a vested interest in a relationship – with their children or parents, with their friends or mates, with their companion animals – issues of value inevitably arise. Participants in relationships create information that is not a cognitive content, but an embodied experience that meaningfully informs movements of the body, thoughts, and feelings.

Jean Piaget also thought of life processes as a complex system of interconnecting relationships, although he imagined that this system converged over the life course toward some Platonic ideal fittedness to 'reality' in the form of intellectual processes that mirrored the properties of the real world.[6] He expresses his view of determinacy and indeterminacy in development in relation to this system as follows.

> The concept of *totality* expresses the interdependence inherent in every organization, intelligent as well as biological. Even though behavior patterns and consciousness seem to arise in the most uncoordinated manner in the first weeks of existence, they extend a physiological organization which antedates them and they crystallize from the outset into systems whose coherence becomes clarified little by little.[7]

Piaget proposed that cognition, developed at first within physiological frames, created its own frames for logical thinking. Pure logical thought was conceived as an 'ideal equilibrium.' This ideal could never be reached, but it could be perceived by a participant in the system.

Piaget described the individual's actual experience of perceiving the ideal equilibrium as the creation of a *value*. Value is

> the expression of desirability at all levels. Desirability is the indication of a rupture in equilibrium or of an uncompleted totality to whose formation some

> element is lacking and which tends toward this element in order to realize its equilibrium ... A good example is that of the norms of coherence and unity of logical thought which translate this perceptual effort of intellectual totalities toward equilibrium, and which therefore define the ideal equilibrium never attained by intelligence and *regulate the particular values* of judgement.[8]

Here, Piaget is talking about the regulation of the self frame in which logical thought occurs with the cultural frame of the norms of logic. The fundamental difference between Piaget's concept of development and mine is that he believed individuals were regulated by the ideal, but never attainable, end state of perfect logical thinking. I suggest that individuals are co-regulated within self, consensual and cultural dialogues and that the developmental trajectories are creative and emergent from the dialogue and the constraints on degrees of freedom within the frame rather than by a Platonic ideal end state.

Nevertheless, Piaget and I are thinking about the same dynamic process of action within a system of relationships. The information that one perceives as a participant in such a system has a value and desirability with respect to the frames of endeavor. I propose that there are three principal forms of informational values: moral, aesthetic and affiliative.

Moral information. Morality is the perception that some actions are better than others; that participation in some frames is more worthy than in others; that there is a choice one can make between good and not-so-good alternatives. Morality also refers to the demands one can make and the expectations one has from co-participants: the sense of responsibility and sincerity in the relationship. Because action and perception are embedded in self, relationship and cultural frames, moral information is created by individuals in relation to those frames.

Aesthetic information. Not only is action perceived as good or bad, better or worse, it is also perceived as well-formed and not so well-formed. Piaget's references to the cultural norms of coherence and unity in logical thought express aesthetic values. The artistry of performance is defined in relation to the cultural, consensual and self frames of participation. In some situations, such as in a business discussion, a more aesthetic social performance is one that is brief and to the point. In others, such as at a conversation over dinner, one expects elaborate stories with humor and contextual detail.

Affiliative information. All relationships have a dimension of liking and loving, attachment and dependency, anxiety, ambivalence or hatred. Which form of affiliative information one creates depends on the frame. In some situations, as in the study of adolescent teasing reported in Chapter 2, a high degree of threat coupled with humor may lead to a strong attachment between the co-teasers. In other situations, as in the work place between boss and employee, or between male and female co-workers, such teasing may be perceived with contempt and hatred.

It is not my goal in this book to elaborate in great detail upon the forms of information created through participation. There are vast literatures on each

of these topics and they deserve a separate and more complete treatment than can be afforded here. My purpose in discussing these topics at the end of this book and in so brief a form is to point out the incompleteness of the ideas presented so far, and the realms of inquiry into which I believe those ideas may have something unique to contribute upon further analysis.

What I have to offer about these information themes is perhaps not new, but rather a way of thinking about them from the perspective of a principled and consistent theory of relationships within the self, family and community. For me, the relationship processes described in this book are elemental components of a theory of development. The relationship processes are the conflagrations out of which information is forged. Morality, aesthetics and affiliation do not exist in the Platonic sense before or after the dialogue: they emerge from its heat.

People often speak as if there are universal principles of morality and aesthetics. These principles, however, are universal only from the perspective of enduring cultural frames for morality, such as those found in legal codes, and cultural frames for aesthetics, such as in ritualized encounters like dance, athletics and warfare, and in art. There are the moral principles of the Ten Commandments, of Confucian wisdom, and of a nation's constitution. The beauty of the agon is embodied in Medea, Joan of Arc, or Martina Navratilova's volley. These things are hardly permanent but none the less powerful and compelling images for some. These cultural frames for morality and aesthetics last over time because they are not only informative to an embodied perceiver with respect to their frames, but because they also allow for creativity and interpretation, for re-invention and elaboration.

Morality

Morality is part of any activity that involves making a choice between alternatives, and alternatives are most clear within a frame in which many of the degrees of freedom have been constrained. Since the nature of dialogue is the creation of new choices, inventing actions within a frame, it follows that all dialogue is a reflection of morality. It also follows that infants make moral choices, and that there is no social endeavor – including science – that is not morally defined.

In the conventional developmental view, morality is believed to begin in the preschool period, tied on the one hand to concepts of right and wrong and on the other to behavior indicative of social responsibility such as caring and altruism. The first moral emotions are thought to appear after language is acquired, when children remark upon things that are incomplete or broken, and when they act to restore things to completeness.

There is a morality, however, even in very young infants who fuss when the nipple is removed before feeding is completed or who become upset when some routine sequence of events is interrupted. What does the interruption

mean to the infant? A common psychological account is to explain this as frustration due to a failure of expectations. This, to me, seems unnecessarily cognitive. It implies that the infant 'has' a generalized expectation based on a representational memory. Even so, why should the infant become upset at the failure of expectations? Many presume that there must be some biological programming of negative emotion that leads to this more or less automatic reaction. And so discrete information is thought to flow from one representational unit to another to produce a response.

Actually, there is nothing particularly compelling about interrupting a sequence of events for a baby. There are some interruptions that mean nothing at all to a baby, such as a change in the family television viewing habits. There are some that result in extreme distress, such as removing the nipple unexpectedly. And there are some interruptions that cause aversion but not distress, which is common in the 'still-face' research manipulation described in an earlier chapter, or when the mother's interactive pace is too fast for the infant.

The interruption becomes a problem of moral choice for the baby only if it occurs in a frame in which the infant is used to having some choice and the interruption removes that freedom of choice. Infants don't choose television shows, and they typically, at least under about 5 months, don't choose to initiate play with an adult.[9] But young infants have a lot of choice with respect to sucking and eating: they are active participants in feeding interactions and the nipple is framed by a dynamic of co-regulation with the feeder. The baby who gets upset when the nipple is removed is not saying 'I didn't expect that to happen,' nor 'This is interesting, I wonder what else is going to happen.' The baby is saying 'I have the right to some control over that nipple and that right is being tampered with irresponsibly.' The baby is morally indignant because she has come to expect, not a sequence of actions, but a moral responsibility that the nipple will be provided in return for her responsible (i.e. co-regulated) temporary use of it.[10]

One could explain the infant's distress on the basis of a biological need/drive, rather than the arousal of moral information. Infants, however, seem to have such reactions to almost anything – not merely feeding – that is meaningful to them at the moment, and for which they have played their part responsibly in an ongoing co-regulated relationship. I don't mean here that infants have the same tug of responsibility toward many features of life that adults have, nor that the infant understands these acts conceptually as moral. Rather, they are moral because of a breach, from the infant's point of view, of the sincerity the infant has perceived during prior encounters. If the infant is not genuinely hungry and the mother doesn't tolerate idle play with the nipple, this is not cause for the creation of moral indignation because the baby comes to recognize that the nipple is provided only when she sincerely requires it. Through these variations on the theme of co-regulation with respect to the feeding frame and the self frame within it,

the infant comes to refine the meaning of sincerity as a responsible partner in this relationship.[11]

Morality, therefore, arises within a relationship as one form of information. There are also more felicitous forms of moral information, as in the pleasure of being a responsible partner and the enjoyment of something completed within the limits of the frame. This is the sense of doing things right, the way they ought to be done, and what's right is always defined by the scope of the frame. It is possible that each frame may create different information about the rightness of a particular action.

In certain communities, premarital sex in adolescence may feel absolutely right in the consensual frame with the partner, categorically forbidden in the cultural frame, and completely wobbly within the endless dialogues of the teenager's self frame. I've discovered informally that many parents in America bring their small infants into their beds with them at night, especially if mothers are nursing. This feels just right in the mother's and infant's self and consensual frames, but is nearly taboo in the Western cultural frame. In Japanese and Mayan societies, on the contrary, it is considered immoral to let a child sleep alone.[12]

Perhaps the realms of discourse in which baby morality is created seem less important, from an adult perspective, compared to adult moral choices about life-and-death decisions, fidelity and infidelity, crime and punishment, war and peace. Certainly, removing a nipple from a baby's mouth is much less destructive than pulling a trigger or denying a civil right. Yet, all these acts have moral consequences for the victims because what has been and should be co-regulated is now unilaterally regulated, imposed rather than negotiated. The morality of freedom and its loss is part of all relationships.

Aesthetics

Aesthetics has to do with the form of the action, rather than the freedom to do it or its consequences. With a few exceptions, the aesthetics of action is not taken seriously in developmental psychology. Aesthetics is not the same as creativity. There is creativity in all aspects of relationships, including in morality and affiliation. One can create ugliness as well as beauty; it makes no difference from the perspective of creativity. Even when psychologists study children's artistic productions, such as their drawing and musical ability, it tends to be from a purely sensory, motor or cognitive perspective.

Aesthetics, however, is an integral and enduring aspect of relationships in self, consensual and cultural frames. Aesthetic information is created when one performs an action or makes something that is somehow more elegant than similar actions intended for the same purpose. Aesthetic information is created in relationships when negotiations are abbreviated into frames, that is, when something more simple is made to stand for something more complex.

A line of poetry is beautiful because of the economy of its expression

as well as because of the flow of it across the tongue. Beauty in art is a combination of movement and economy, flow and the ability to represent something much bigger than the work itself. A tennis stroke is beautiful when there are no wasted movements and the force of the whole body and the arm is communicated to the ball through the racquet.

The philosopher Kenneth Burke makes the case for what he calls a poetic psychology.

> Since social life, like art, is a *problem of appeal*, the poetic metaphor would give us invaluable hints for describing modes of practical action which are too often measured by simple tests of utility and too seldom with reference to the communicative, sympathetic, *propitiatory* factors that are clearly present in the procedures of formal art and must be as truly present in those informal arts of living we do not happen to call art.[13]

The quote from Mary Catherine Bateson presented earlier in this chapter suggests that developmental change is guided by a similar aesthetic. She also states that 'composing a life has a metaphorical relation to many different arts.'[14]

In early infancy, after a period of negotiation, infants begin to abbreviate their actions. For example, after months of negotiating mutual gaze, infants will use a brief glance at the mother to indicate a readiness to participate in that consensual frame. Why does the child come to use the more elegant form instead of continuing to spend long periods negotiating who looks at whom and when? The infant probably wants to pursue other goals with the adult, and an aesthetic is required to simplify the communication system to make room for the innovations.

Take the example of infant Hannah, discussed in Chapter 6. Hannah and her mother endured weeks of laborious interchanges in which they both meant something different by their offers of objects. When Hannah finally 'got' the point of the game, she handed the telephone to the mother with obvious delight. Now the offer meant a request to play the telephone game. A cognitive explanation views Hannah as having an insight, as having been guided into the frame of the game and finally making it part of her own actions through advanced understanding.

My interpretation is that the offering was perceived, at that moment, as aesthetically pleasing. There was, for both baby and mother, a certain beauty to be experienced in the frame: everything fitted together economically; there were no wasted attempts at communication and repair. They were dancing rather than stepping on each other's toes.[15]

The evidence that infants can perceive the difference between the beautiful and the disagreeable is sparse, perhaps because few have looked for it. Some recent findings by Judith Langlois, however, suggest that infants in the first half-year prefer to look at faces that adults have judged to be attractive compared to unattractive faces.[16]

Research on the expressive behavior of preschool children by Alan Sroufe and his colleagues suggests that there is an aesthetics of communication processes that accompanies the aesthetics of physical attractiveness. Linda was not as popular as she might have been because she displayed both appealingly positive as well as ugly negative expressions.

> Linda was a beautifully expressive child. Her exuberance and flashing smile were unparalleled by any other child in her class. When she enthusiastically greeted a visitor with a 'Hi! I haven't seen you in a LONG time!' (accompanied by her ear-to-ear smile), it is no wonder that the visitor was charmed . . .
>
> Tracy, John, and Linda had been playing happily on a couch. When the three of them leave, Jerry climbs onto the couch. Linda returns to the couch and shouts at him 'You get off my couch!' She climbs on the couch and pushes him, trying to grab the pictures he is holding.[17]

John in the same class was judged as not being physically attractive based on ratings of photographs, and he scored low on tests of cognitive function.

> Yet he was rated high on social competence by teachers and was well liked by the children, having several close and warm friendships. His uniformly positive initiations and response to other children – his 'sweet nature' as one teacher put it – quite obviously played an important role in his social success.[18]

Children of lower popularity in the classroom were less expressively attractive, either affectless or showing inappropriately intense expressions. The impression that individuals are beautiful, lovely or sweet is a reflection of aesthetic information created when communicating with or watching these individuals. We know too little about the extent to which infants and young children perceive this dimension of information and we have few techniques with which to study the aesthetics of action in everyday situations.[19]

It is not the case, especially for infants, that they know what is aesthetic in advance. Rather, they create it as perception and action within a frame. A child may recognize that mumbling a word is sloppy work if the communication and self frames provide constraints for saying it more beautifully.

Affiliation

Studies of affiliation are plentiful in parent–infant and in peer relationship research, focusing on issues such as attachment, friendships and their variations. No one would deny, therefore, the importance of affiliative information in the development of relationships. Indeed, one of the most successful measures ever designed to classify individuals is Mary Ainsworth's measure of infant attachment using the Strange Situation Test.[20] The research that has been done on infant attachment is very consistent with the relationship models proposed in this book, showing that attachment may remain stable under some conditions and change under others, leading to distinctly different developmental trajectories within relationships.[21]

I say this in spite of my earlier complaints about the concept of the internal working model, a discrete representational approach that derives from Bowlby's attachment theory. I believe that data on attachment are better explained from the perspective of information within relationship frames: forms of attachment represent different qualities of affiliative information such as secure, anxious and resistant. This information is not, however, contained as a representation – a working model – within the individual infant. Rather, it is created in the dialogue of the mother–infant consensual frame, and is re-created in the dialogue of the self frame.

Research suggests that actions toward self and toward others during the preschool years are related to the security of attachment with parents measured during infancy. Securely attached children, for example, more readily and correctly identify features of themselves and their mothers, and they are facile at creating pretend narratives in which dolls play the roles of mother and child. Insecurely attached infants tend to make more incorrect and negative attributions of self and mother.[22]

I discussed earlier how increasing intimacy, a developmental change in a relationship toward new affiliative information, is created by the co-regulated constructions of new frames for affiliation and their continued mutual elaboration. Assuming that the creation of affiliative information is pleasing and arousing, one does not need an internal working model to explain its developmental transitions. The frame constrains actions into increasingly closer spheres of intimacy, or out to increasing distance and disengagement.

Relationship development is not regulated toward some Platonic ideal of perfect intimacy, no more than intellectual development is regulated toward the Platonic ideal of perfect logic. Development is created out of co-regulation in dialogue and converges toward information that is moral, aesthetic and affiliative within those frames.

In summary, the relational model of development proposed here forces one to consider information in its holistic sense, not in its purely cognitive sense. How the information is created depends upon where one is situated in the network of connected frames that comprise the on-goingness of life as a process. Life is the dialogue, stirred by creativity and warmed by the passions of participation.

Research approaches to relationship development

To study relationship systems one has to maintain a focus on the individual actors and follow them through developmental time, research that keeps life courses and relationship courses as fundamental units and that eschews group means. General or nomothetic principles are not going to be found in any collection of group statistics. According to Thorngate,

> It is tempting to equate the nomothetic approach with the analysis of averages. To do so is to equate statistical models of experiments with models of people . . . To find out what people do in general, we must first discover what each person does in particular, then determine what, if anything, these particulars have in common. This implies that we pay more attention to case histories, find or develop models sufficient to account for each, then examine the models for common themes or elements.[23]

Esther Thelen proposes the following.

> When considerable individual differences are expected in the outcome, it is even more crucial to use *individual developmental trajectories* as the primary data source. Once individual developmental paths are identified, it may then be possible to cluster subjects, not on the basis of outcome, but on the basis of route. This means that detailed longitudinal studies are necessary to capture the times of stability and change.[24]

I have made similar points.

> Typical developmental methodologies that seek independent measures of mother and infant assume that a rather sharp line can be defined between the individual and the social environment . . . When investigators reify the boundary between organism and environment, they mask the dynamic processes of self-organization that constitute developmental change. *When organism and environment are conceptualized as distinct for the purpose of measurement, one cannot reconstruct from those measures alone the dynamics of the developmental process* . . . Given repeated observations on the same subjects, and contextually appropriate measures, analytic approaches can be applied that preserve the integrity of the individual's life history in order to construct generalities of developmental change. *It is only when a sufficiently large sample of individual case histories are collected that longitudinal process research can be generalized to the population . . . To study development as a dynamic phenomenon, we must observe the system in the process of changing*, and not simply before and after the change takes place.[25]

Susan Oyama proposed that rather than measuring and ranking, correlating and predicting, developmental research should

> show us about the timing of events, the susceptibility of processes to various kinds of perturbation and the manner in which the regulation is achieved, if it is achieved . . . what is needed to enable a particular developmental sequence to proceed, what will induce, facilitate or maintain such a sequence, how does sensitivity to these factors change with developmental state, what degree of specificity is evident in these interactions, what is the relationship among events at various levels of analysis?[26]

Research, in other words, should be open to the contingent and creative processes by which relationships form and change, that is, to the possibility for both determinacy and indeterminacy. It should be designed to see the whole elephant, not just its tail. Experimental studies have a role in

process research, but only when perturbations of ongoing process can reveal something about branching developmental pathways. Thus, one would want to preserve as much as possible about a relationship frame while perturbing selected elements to observe the effects on the self-organization of the whole system.[27] Studies that compare the formation of relationships under different naturally varying conditions are also useful, especially if each relationship system is observed relatively frequently and the samples are matched on all dimensions except for the particular disturbance or difference that is being compared.[28]

The problem of research on relationships for the investigator is to enter into frames of co-participation as an outsider and to preserve as much as possible about the evolution of the process without distorting it beyond recognition. This research is time-consuming because one has to wait for development to occur with a watchful eye and most human relationships can't tolerate that degree of scrutiny without disturbance. Nevertheless, I have found that it can be done with an appropriate measure of sensitivity to the participants, respect for their courage to allow scientists to examine their secrets, and recognition of their pride that comes from collaborative participation in scientific frames of discourse.

I have felt humility and gratitude in the company of the infant and mother life histories we have collected for ongoing study. From them I have created time-lapse films, assembling a picture of relationship development by taking ten-second clips of a mother and baby playing with the same toy each week over a six-month period. This is probably not very scientific, at least not yet – not until I can afford the technology and expertise to couple these video images with computer imaging and simulation in as sophisticated a way as the local meteorologist on the evening news. But like the time-lapse films of cloud formation and flowers blossoming that I saw as a child, I watch in awe at the beauty of social systems being created, blooming and changing. I think we know less about what is between us in our everyday relationships than we know about the austere space between stars in a galactic frame.

Notes

1. Bandura (1986, p. 33).
2. Bateson (1989, pp. 3–4).
3. Bandura (1986); Sameroff (1989); Sroufe (1989); Thelen (1990).
4. Bandura (1986, p. 33).
5. I was, as I mentioned earlier, majoring in physics and mathematics, but I had an active dislike for chemistry that my girlfriend would surely have known about. We have been together since that time, possibly in part because she did not buy me a chemistry book, which would have shown a lack of sensitivity to my interests.

I chose the example of Herbert Brown because I was working at Brown's university, Purdue, at the time he was nominated for the Nobel prize. He became an instant celebrity at the university, in the community, in the state of Indiana, and indeed in the nation and world. In addition to reading weekly and sometimes almost daily articles in the local newspaper about the legendary graduation present and other stories about him, I remember being struck by how much the Nobel prize itself changed his life. For most of the next year and beyond he spent much of his time with interviews and phone calls, appearing on talk shows, giving presentations at community functions, travelling everywhere, and just generally coping with being famous outside the academic frames in which his earlier notoriety had been managed. The sudden opening of new frames can be just as important in the life course as any particular innovative event or action.

6. Haroutunian (1983).
7. Piaget (1962, p. 10)
8. Piaget (1963, p. 11), italics are mine.
9. Kaye & Fogel (1980); Cohn & Tronick (1988).
10. Cavell (1979); Hearne (1987); Winnicott (1971).
11. Sincerity is one of the maxims that Grice (1975) proposes as a necessary component of discourse: that speakers should treat each other's utterances as truthful and genuine until proven otherwise. Sincerity may be violated in consensual ways, as in humor and play.
12. Morelli *et al.* (1992).
13. Burke (1954, p. 264).
14. Bateson (1989, p. 4).
15. Others (Stern, 1985; Thoman & Browder, 1987) have used the metaphor of dancing in a different way, to mean something more like swaying together to the same body rhythms rather than to refer to the aesthetics of the movements. Dancing to the same rhythms can be beautiful or pitiful, depending on how it's created and perceived.
16. Langlois *et al.* (1987; 1990).
17. Sroufe *et al.* (1984, pp. 306–7).
18. Sroufe *et al.* (1984, pp. 306–7).
19. Burke (1954).
20. Ainsworth *et al.* (1978).
21. Sroufe & Jacobvitz (1989).
22. Pipp, Easterbrooks & Harmon (1992); Suess, Grossmann & Sroufe (1992).
23. Thorngate (1987, p. 75).
24. Thelen (1990, p. 39).
25. Fogel (1990a, pp. 343–4, 354).
26. Oyama (1985, pp. 160–1).
27. See, for example, research in which the mother–infant interaction is preserved while specific aspects of maternal action are changed (Cohn & Tronick, 1983; Fogel *et al.*, 1982; Fogel, Dedo & McEwen, 1992; Tronick *et al.*, 1978).
28. In infant development, for example, research comparing relationship differences in depressed vs. non-depressed mothers (Bettes, 1988; Field *et al.*, 1986; Fleming *et. al.*, 1988; Gelfand & Teti, in press; Jameson *et al.*, 1991); comparing relationships in other forms of maternal psychopathology

to normal mothers (Schneider-Rosen & Cicchetti, 1991; Main & Solomon, 1986; Sameroff & Emde, 1989; Sroufe, 1989; Stern, 1985); comparing mother–infant relationships between pre-term and full-term infants (Barnard *et al.*, 1984; Branchfield, Goldberg & Sloman, 1980; Crawford, 1982; Easterbrooks, 1989; Oehler, Eckerman & Wilson, 1988; van Beek & Geerdink, 1989); comparing mother–infant relationships between handicapped and non-handicapped infants, as in Downs' vs. normal infants (Cicchetti & Sroufe, 1978; Jones, 1980; Stevenson, Leavitt & Silverberg, 1985); and comparing mother–infant relationships in infants with varying degrees of psychosocial risk (Rutter, 1987; Wachs & Gruen, 1982; Werner, 1979).