Overview of the research problem and summary of findings

> The real is fragile and inconstant:
> its law is restless change:
> the wheel of appearances turns and turns
> over its fixed axis of time.
> [Es frágile lo real y es inconstante;
> también, su ley el cambio, infatigable:
> gira la rueda de las aparencias
> sobre el eje del tiempo, su fijeza.]
> Octavio Paz, *A tree within
> (Arbol adentro)*, pp. 14–15.

> . . . change is conceived partly as the continuous transformation of the one force into the other and partly as a cycle of complexes of phenomena, in themselves connected, such as day and night, summer and winter. Change is not meaningless – if it were, there could be no knowledge of it – but subject to the universal law, tao.
> Richard Wilhelm, Introduction, *The I Ching or Book of Changes*, p. *lvi*.

The scientific study of change is an oxymoron. Science attempts to observe and classify, to demarcate and delimit, to specify and contain. Change resists classification, limitation, and containment. Things change and nothing remains the same. If observed a sufficiently long period of time and with sufficient patience, everything in the entire universe changes. Change must be a fundamental property of all things – just as the concrete features that appear to us at any moment can be called properties of things. The universe unfolds from the big bang. An embryo becomes an adult. Mountains are pushed through the earth's crust and then erode.

The quoted excerpts on the opening pages suggest that change may obey universal laws. The idea of a law of change also appears to be an oxymoron. There is at least one way that change can be lawful. This can occur if the pattern of change repeats itself. The simplest example is the repeating pattern of the seasons of the year. Depending upon your global latitude, the "same" pattern of seasons repeats every year, albeit with

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variations from one year to the next. This type of change is cyclical. There is clearly something lawful about seasonal cyclic change: a set sequence of seasons related to the inclination of the earth's axis with respect to the sun.

Historical change, on the other hand, does not at first appear to be lawful. It is a continuously unfolding process from one generation or event to the next. While the atmospheric climate is cyclical, the earth registers the cycles historically with wind and water erosion. Global warming and ice ages are probably examples of atmospheric changes that are historical, built over time by an accumulation of past events. Geologists and climatologists, however, seek laws of historical change in these domains by searching for hidden repeating cycles with the "continuous transformation of one force into the other" (see opening quote from the *I Ching*).

In this book, we set out to ask whether the historical changes manifested in the development of interpersonal relationships contain hidden cycles, patterns, or laws. All humans go through the life cycle, moving in a known sequence from one developmental stage to the next. Even though we are studying change across a well-known developmental succession in early infancy, the occurrence of particular developmental stages in a particular sequence is not the type of law that we seek to uncover. Rather, we are searching for laws of change that could be applied to the developmental transitions between any two stages of the life cycle, or between any two stages of relationship growth (stages like acquaintance, friendship, and intimacy or dating, engagement, and marriage).

Research on the problem of change processes in development has been facilitated by recent advances in dynamic systems theory within developmental psychology and historically grounded qualitative methods in life history research. Based on these advances, we present a method called **relational-historical research** on developmental change processes in interpersonal relationships. Relational-historical research rests on three premises: that the developing relationship (not the individual) is the unit of analysis, that change emerges from but is not entirely constrained by the patterns of the past, and that developmental process is best revealed by making frequent observations within a particular case before, during, and after a key developmental transition.

In this work, we studied developmental change process in interpersonal relationships using mother-infant dyads. In particular, we studied the developmental transition, around four months of age, from primarily face-to-face communication to communication about and with toy objects. In this transition, mother-infant dyads use face-to-face play as

the historical background from which to launch a triadic relationship: infants' exploration of the object world in the company of their mothers.

We make the working assumption that his developmental transition may serve as a model for many other relationship changes in which exclusive focus on the dyad is replaced by an addition beyond the dyad: the birth of a child for a married couple or the addition of a new member into an existing group. This work may also be a model for the introduction of a new or "foreign" topic into an existing relationship. This may be, for example, an interpretation in psychotherapy or a suggestion for an innovative way of relating in a romantic couple.

The relational-historical research used here focuses on the description of change in dyadic communication from the perspective of the history of that communication within the dyad. We used a multiple case-study design of thirteen infant-mother dyads, when the infants were between the ages of two and seven months. Each dyad was videotaped for ten minutes weekly while interacting spontaneously with a set of age-appropriate toys. Relational-historical research combines quantitative analyses of developmental trajectories and behavior sequences with qualitative descriptions of the historical emergence of change and stability within dyads.

In this study, we focus on observable patterns of communicative behavior rather than on each participant's subjective experience. Interpersonal relationships have regularly recurring patterns of communication called **frames** (See Chapter 3). Frames are segments of co-action that have a coherent theme, that take place within a particular location (in space or in time), and that involve particular forms of mutual co-orientation between participants. The coherent themes involve shared meanings or goals, implicit or explicit, about the nature and course of the communication. Examples of frames are recurring topics in conversation and interaction rituals such as bedtime stories. Frames recur repeatedly over weeks and months and are reconstituted dynamically and dyadically each time they reappear.

The communication between these mothers and infants was coded into four frames that form the basis for the data analysis in this study. The **social frame** was coded when the topic of communication was face-to-face play without objects. The **guided object frame** was coded when mother took an active role in demonstrating and scaffolding the infant's use of objects. The **non-guided object frame** was coded when the infant played with objects without the mother's direct assistance but with her ongoing attention and verbal commentary. The **social/object mixed frame** was coded when elements of both face-to-face play and guided object play appeared at the same time, as when a mother used a

toy to touch the infant's face or body while vocalizing in an expressive manner typical of the social frame. These frames are illustrated in Figure 0.1.

By way of preview of our main results, we found that there was a three-part historical sequence of the change process: historical frames, developmental bridging frames, and the emergence of new frames. Depending upon the dyad, the historical frames were either the social or the guided object frames. The bridging frames were either the social/object mixed frame or the guided object frame, and the emerging frame was the not-guided object frame for all the dyads. This is represented as the following sequence:

$$(P_1) \quad (\text{Historical} \leftrightarrow \text{Bridging}) \Rightarrow (\text{Bridging} \leftrightarrow \text{Emerging})$$
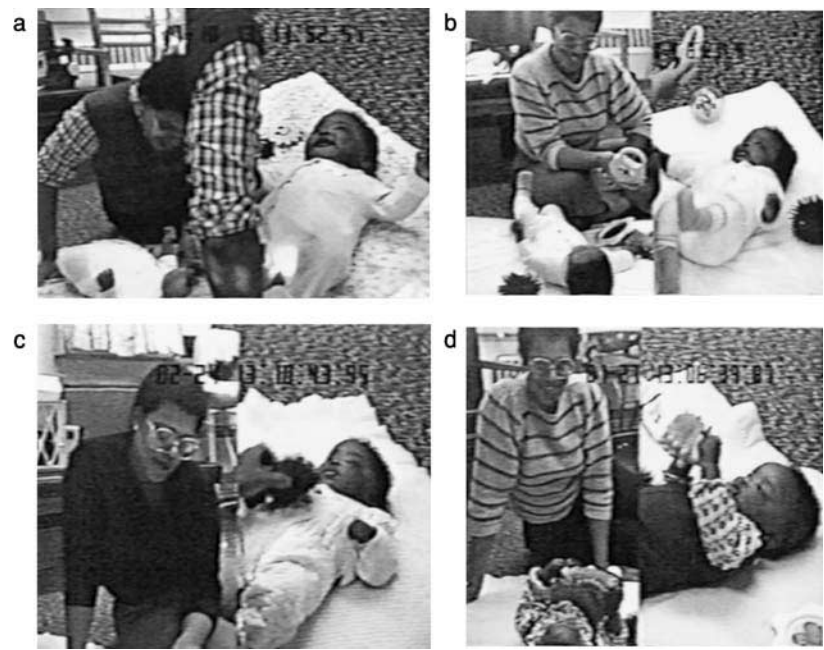

Figure 0.1. (a) Social frame (mother and infant engaged in face-to-face play without objects), (b) guided object frame (mother demonstrates objects while infant observes), (c) social/object mixed frame (mother uses object socially, as in tickling the baby with the toy), (d) not-guided object frame (the infant explores the object while mother observes).

In this sequence, the inner bi-directional arrowheads represent real-time transitions between frames, such as when a guided object frame is immediately followed by an instance of the social frame. The bold unidirectional arrowhead represents the developmental time sequence. Thus, before the bold arrow, the dyad spends most of their time in historical and bridging frames and makes regular realtime transitions between them. After the bold arrow, the dyad spends most of their time in emerging and bridging frames and makes regular transitions primarily between these two frames. We considered a particular target frame to serve the function of **bridging** if it met four criteria:

- If realtime transitions between frames in any observation session were more likely between the target frame and the historical frame, or between the emerging and the target frame, as compared to the likelihood of realtime transitions directly between historical and emerging frames.
- If the target frame became predominant in duration in the weeks in between when the historical frame was predominant and later when the emerging frame becomes predominant (A bridging frame, therefore, "touches" and mediates between historical and emerging frames both in realtime and in developmental time).
- If the target frame contained some elements of the emerging frame of mother-infant-object communication, yet it occurred developmentally before the emerging frame becomes the predominant pattern.
- If the target frame contained elements of the historical frame, yet it occurred developmentally after the historical frame became the predominant pattern.

Bridging frames arose spontaneously in all of the dyads and bridging appears to be a process that serves several developmental functions. First, bridging frames point toward the future since they always contained some elements of the emerging frame of mother-infant-object communication. Second, bridging frames also contained elements of the historical frame, thereby carrying the relational history within them. In most cases, the social/object mixed frame served as the bridging frame. During this frame, the dyad uses objects as if they were part of social play – such as mother tickling the baby with the object – and not as objects for exploration. Bridging frames, therefore, seem to buffer the developmental transition from the old to the new by creating an intermediate frame having elements of past and future. We argue that bridging frames provide communicative stability that allows the dyad to try out the future actions without having to suddenly let go of the historical stable patterns to which they have become accustomed.

The accompanying series of photos (Figure 0.2) illustrates a realtime transition, in a single observation session for one dyad, between the guided object frame (the historical frame), the social/object mixed frame (the bridging frame), and the not-guided object frame (the emerging frame). Note that the bridging frame of "kissing" the baby's face with the object serves as a transition between the mother's demonstration of the object and the infant's taking hold of the object.

Some models of change derived from dynamic systems theory suggest that developmental change occurs in sudden jumps called phase

Figure 0.2. A realtime transition from the guided-object (historical) frame, to the social/object mixed (bridging) frame, to the not-guided object (emerging) frame. The bridging frame, in which the mother uses the toy to "kiss" the infant's face, mediates the realtime transition between the historical frame in which mother is demonstrating the toy while the infant observes and the emerging frame in which the infant is holding the toy while the mother observes.

shifts or catastrophes, and that during this period of change the system experiences a relatively chaotic form of variability. In our data, although the developmental trajectories of some individual frames indeed had rather abrupt increases or decreases, our results on bridging frames suggest that for the developing relationship as a whole – the multiple frames taken as a complex communication system – developmental transitions need not be precipitous or chaotic. The fact that every dyad in our sample showed some form of bridging suggests that social systems capitalize on their complexity to create relatively smooth developmental transitions: literally to make bridges between the old and the new.

Our concept of bridging may apply more generally to many different types of relationship change. Consider romantic relationships, for example. The general model could be applied in the following ways:

$$(\text{Historical} \leftrightarrow \text{Bridging}) \rightarrow (\text{Bridging} \leftrightarrow \text{Emerging})$$
$$(\text{Courtship} \leftrightarrow \text{Betrothal}) \rightarrow (\text{Betrothal} \leftrightarrow \text{Marriage})$$
$$(\text{Marriage} \leftrightarrow \text{Pregnancy}) \rightarrow (\text{Pregnancy} \leftrightarrow \text{Parenting})$$

Most societies have some finite period of betrothal, such as an engagement period marked by rituals such as engagement rings, wedding planning, and parties, prior to marriage. Perhaps society has simply discovered the importance of bridging courtship and marriage and thus developed a culturally standardized bridging period. In the model above, we refer to conversational frames about courtship, betrothal, and marriage as well as to the ongoing formal state of being betrothed or married. In the case of pregnancy, bridging occurs by the fact of biology but it still serves the same function: a window of time in which couples can make the developmental transition to include a new family member. In addition, in the historically prior period, conversational frames about pregnancy are more likely to occur and make realtime transitions with conversations about the everyday occurrences of married life, than are conversations about parenting.

In therapeutic and educational relationships there is likely to be a bridge between the known and the new. Psychotherapy clients are unlikely to accept the intensity of their own feelings of loss, separation, or trauma unless they can first feel as if there is emotional safety in the relationship. Therapists can create a bridging frame around acceptance and empathy that bridges the emerging reconstructive work that creates new patterns of thinking and feeling for the client. Teachers must package new knowledge in ways that students can see its relationship to what they already know. They must create a set of supports and encouragements that keep a student working hard toward an emerging understanding that they do not yet possess.

Coming back to our results, we further found that there are different
types or levels of change in relational-historical systems. First there are
realtime transitions between frames, that is, when the dyad shifts from
one to another frame. These were brief but recognizable periods in
which actions from the prior frame were either deleted, included, or
overlapped with the next frame during the transition. We also found
transitions between different actions within the frame, actions that could
be considered variations on the theme of the frame. These changes
between the actions that constitute this variability, however, do not
change the frame but rather serve to constitute the realtime dynamics
of what is usually done during a particular frame. We call this type of
change ordinary variability or **level 1 change**. Level 1 change in both
frames and transitions are forms of stable change, change that maintains
the frame or transition in realtime. Level 1 change shows how even
regularly recurring patterns in communication are always dynamically
changing even as they remain "the same."

To illustrate level 1 change, imagine a pair of friends that share a frame
for meeting regularly for lunch. They show level 1 change because they
do not always eat in the same restaurant, nor do they always meet on the
same day of the week. These things change while the frame remains
the same. For them, the variability in time and location is ordinary, an
accepted part of the frame.

Figure 0.3 illustrates level 1 change for one of our mother-infant
dyads. The mother holds and demonstrates to the infant a series of
different toy objects. The toys change and the actions with the toys vary
to some extent, but the guided object frame – in which mother holds the
toy and the infant watches – remains unchanged.

Level 2 change is defined as an innovation within the ordinary
variability of the frame dynamics. An innovation is a novel action
appearing for the first time over the history of observations of a particular

Figure 0.3. Level 1 change, or ordinary variability, during the guided
object frame. The mother demonstrates different toys while the infant
observes.

type of frame. We discovered that at its first appearance, the innovation
has the effect of maintaining the ordinary, level 1 variability even as it
introduces a new element into the frame. At this level, an innovation
does not significantly alter the ordinary variability within the frame when
it first occurs.

For the pair of friends with a regular lunch frame, level 2 change is a
change that is more out of the ordinary for the couple. This could occur
in many different ways. They may decide, one time, to go to a really
expensive restaurant that was not part of their ordinary pattern. Or, they
may decide to meet for dinner, or to go for a walk after lunch. So long as
the participants perceive the change as substantially different from what
they shared before, it can be called level 2 change. When it first occurs,
level 2 change typically does not alter the general pattern of the frame:
the act of meeting together regularly and talking to each other.

Figure 0.4 illustrates level 2 change during the guided object frame in
one of our mother-infant dyads. In the previous set of photos from the
guided object frame, the mother demonstrated a series of toys while the
infant watched. In these examples the mother attempts briefly to place a
toy into the infant's hand. The infant, however, did not hold the toy for
long and the mother quickly resumed the ordinary variability (level 1
change) of the guided object frame. These level 2 innovations, therefore,
did not change the basic pattern of the guided object frame in the session
when they first appeared.

We found, however, that some innovations appear to become
"amplified" in subsequent sessions, developing into a new predominant
pattern of ordinary variability within the frame and replacing the prior
regime of ordinary variability. When this occurs, a "significant change"
in the system arises. These "significant changes" constitute **level 3
change** or developmental change. This finding also shows that in all
cases that we observed, the origin or source of significant changes in
frame dynamics is the appearance of innovations in earlier sessions. We
write this developmental process as follows

$$P_2 \quad \text{level 1} \rightarrow \text{level 2} \rightarrow \text{level 3}$$

Our analysis of levels of change leads us to suggest that innovations are
a way in which the relationship tries out novel actions but without a
serious alteration of the current pattern of ordinary variability. If these
novel actions are accepted or ratified by the members of the dyad upon
subsequent occasions, they become amplified in importance to the dyad
gradually replacing the old pattern. Innovations are seeds that may
change the ordinary variability within frames and that have the potential

to alter the dynamics of the other frames in the entire relationship system.

When developmental change is observed, as indicated by a significant increase or decrease in the duration of frames in the system, it is typically accompanied by a permeability of the frames: frames incorporate innovations from other frames and, as a result, new frames form while historical frames dissolve. This is part of the dynamics that occur during the bridging period. For the friends who shared lunch and perhaps went out to dinner together, this dinner might have been a one-time event and their relationship may have continued in the same lunch-time pattern without a significant developmental change. On the other hand, the

Figure 0.4. Level 2 change, or innovations, during the guided object frame. Mother attempts to put a toy into the infant's hand and the infant reaches. On another occasion, mother offers toy and infant takes it. Each of these instances was a divergence from the ordinary variability of the guided object frame. In each case, the frame dynamics quickly return to the ordinary variability of demonstrating objects while infant observes.