

CHAPTER FOUR

The Family Ecology of Adolescence: A Dynamic Systems Perspective on Normative Development

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Introduction

Several scholars have comprehensively reviewed the role of parents in normative adolescent development (e.g., Collins, 1990, 1995; Collins & Laursen, 1992; Hill, 1987; Hill & Holmbeck, 1986; Holmbeck, 1996; Holmbeck, Paikoff, & Brooks-Gunn, 1995; Laursen & Collins, 1994; Laursen, Coy, & Collins, 1998; Paikoff & Brooks-Gunn, 1991; Silverberg, Tennenbaum, & Jacob, 1992; Steinberg, 1990). Our goal in this chapter is to approach this growing literature through the lens of a dynamic systems framework, moving from a person-centered perspective to a focus on relationships, and the community and cultural context in which these relationships are embedded. In the first section, we introduce an ecological framework to serve as a heuristic for organizing the multiple systemic factors that impact on adolescent development. In the second section, we argue that although the ecological framework is critical for demarcating global influences, it falls short of specifying the mechanisms by which they transform family relationships and

This project was supported by a Postdoctoral Fellowship award to the first author, granted by the Social Sciences and Humanities Research Council of Canada, by grant DA 07031 from the National Institute on Drug Abuse at the National Institutes of Health to the second author, by grant MH 46690 from the National Institute of Mental Health to John Reid, Ph.D., and by grant MH 37940 from the National Institute of Mental Health to Deborah Capaldi, Ph.D.

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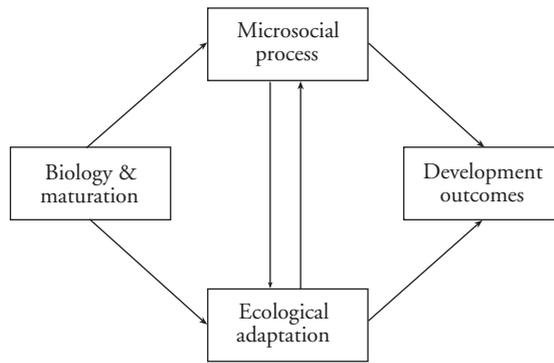


Figure 4.1 An ecological model.

adolescent outcomes. Thus, to identify these underlying mechanisms, we introduce a number of dynamic systems (DS) principles which are particularly relevant for understanding change and stability in developmental trajectories.

Next, we use these DS explanatory tools to understand the intra-individual and interpersonal processes that transform during adolescence. We follow this largely theoretical discussion with some preliminary results from an ongoing longitudinal project with parents and adolescents. Finally, we conclude the chapter by returning to broader ecological considerations, including the interrelations between the family and peer systems and the influence of community and culture on adolescent adjustment.

Ecological Framework

Our first step in discussing normative adolescence and the role of the family is to create an organizing framework for considering the domains of influence and time scales within which adolescent development unfolds. Our model builds on the insightful works of other developmental theorists (Bronfenbrenner, 1989; Hinde, 1989). Figure 4.1 summarizes the ecological framework, consistent with previous work on understanding problematic development in adolescence (Dishion, French, & Patterson, 1995b; Dishion, Poulin, & Medici Skaggs, 2000).

There are four domains that mutually interact to create many of the dynamics we see in adolescence. Biological change is considered the “prime mover” of development. Changes in hormone levels, physical growth, brain development, and concomitant refinements in emotion and cognition initiate transformations in both microsocial processes and social environments. In turn, reciprocal interactions between microsocial processes and ecological adaptations influence long-term developmental outcomes.

For example, parents are often concerned about the social niche in which their children participate. They manage their children’s social relationships with an eye toward the future (Parke et al., 1988). They compete for opportunities to have their child on the “best soccer team,” enroll them in private schools, and become involved in various

organizations, church groups, and so on. These ecological adaptations, in turn, affect the types of microsocial interactions in which children participate.

Moreover, the kinds of ecologies available, and the nature of the constituent interactions, vary from culture to culture. For example, in non-Western cultural contexts, adolescents may spend more time within an extended family network of aunts, uncles, cousins, and grandparents than with their own nuclear family. In contrast, in Western cultures, adolescents often coregulate network connections between peer groups (unrelated to biological families) and some variation of a biological family. Each of these contexts constrain microsocial interactions and have implications for developmental outcomes.

Across many cultures, in terms of family life in particular, a great deal of research suggests that a parenting context characterized by high degrees of warmth and responsiveness on the one hand, and firm behavioral control and maturity demands on the other, is critical for promoting healthy development (e.g., Baumrind, 1991; Steinberg et al., 1995). Responsive parenting during adolescence includes encouragement of independence, negotiation through verbal “give-and-take,” and warmth and support. Although proper monitoring is critical for minimizing problem behavior (Baumrind, 1991; Dishion & McMahon, 1998; Patterson, Reid, & Dishion, 1992), under “normal” circumstances, monitoring might better be conceptualized as a bidirectional, cooperative family process (Dishion & McMahon, 1998; Stattin & Kerr, 2000) in which the adolescent has learned what is expected of her and parents generally trust that these expectations will be met. Thus, the family relationship context shapes adolescents’ patterns of adaptation and, in turn, these behavioral adaptations influence family relations.

Finally, in figure 4.1, we consider the joint influence of microsocial processes and ecological adaptations as jointly impacting on the long-term outcomes associated with adolescence. The gist of this model is that communities, and the family and peer systems embedded within these communities, self-organize around the changes in childhood and adolescence to assure that socialization does not go astray and that successful outcomes are guaranteed for nearly all members. In the classic cross-cultural study reported by Whiting and Whiting (1975), for example, cooperation with family members (e.g., involvement in family chores) was the key process that contributed to adolescents’ prosocial development. In addition, a warm, supportive family context has been found to relate to a host of positive psychosocial outcomes including high self-esteem, self-confidence, and competence in areas of school achievement (e.g., Hill, 1987; Hill & Holmbeck, 1986; Holmbeck et al., 1995; Steinberg, 1990; Steinberg et al., 1995).

Although a large body of research has focused on identifying optimal family contexts, much less is known about the specific mechanisms by which these different levels of the ecological framework influence one another. Can we identify the processes responsible for initiating the various biological, emotional, and cognitive reorganizations occurring at the individual level? And by what process do these intrapersonal factors stabilize and become coordinated with broader ecological contexts, such that pathways of normative socialization proceed relatively undisturbed?

To address these process-level questions, and to better understand the mechanisms underlying both change and stability that characterize this developmental phase, we introduce a number of dynamic systems principles. The application of these principles within

a broader ecological framework has provided us with an integrative model that can address intraindividual and interpersonal processes, as well as the diversity and equifinality of adolescent development. Before proceeding with our modeling efforts, we provide a brief overview of the relevant DS principles (more detailed explanations of DS principles can be found in reviews by Thelen & Smith, 1994; Fogel, 1993; Lewis, 2000).

Principles of Dynamic Systems

Overview

Some scholars have suggested that systems approaches to studying development have provided an interesting metaphor, but offer little more (Cox & Paley, 1997; Reis, Collins, & Bersheid, 2000; Vetere & Gale, 1987). Perhaps this has been the state of affairs for general systems theory or, more specifically, family systems theory, but we argue that the application of DS principles to understanding development provides the conceptual toolkit necessary for considering the complexity surrounding normative adolescent development.

In fields as diverse as physics (e.g., Haken, 1977), chemistry (e.g., Prigogine & Stengers, 1984), biology (e.g., Kauffman, 1993; Kelso, 1995), neuroscience (Freeman, 1995) and evolution (e.g., Goerner, 1995), DS principles have proven critical for providing explanations of change and stability. Several developmentalists have begun applying these principles to ontogenesis (e.g., Fogel, 1993; Fogel & Thelen, 1987; Keating, 1990a; Lewis, 1995; Lewis & Granic, 2000; Thelen & Smith, 1994; Thelen & Ulrich, 1991). Social psychologists (Vallacher & Nowak, 1994, 1997) and developmental psychopathologists (Cicchetti & Rogosch, 1997; Lewis & Granic, 1999; Pepler, Craig, & O'Connell, 1999) have also begun to explore their utility. For these theorists, DS principles of feedback, multistability, interdependent time scales and nonlinear change have been particularly useful in extending conventional models of psychological functioning. Strictly speaking, dynamic (or dynamical) systems theory is a technical, mathematical language. Following other developmentalists (e.g., Fogel, 1993; Fogel & Thelen, 1987; Keating, 1990a; Lewis, 1995, 1997; Pepler et al., 1999; Thelen & Smith, 1994; Thelen & Ulrich, 1991), our approach has been to import the DS language as a heuristic tool for explaining the processes that give rise to, and maintain, developmental relationships. Table 4.1 provides a summary of the relevant principles, definitions, and psychosocial illustrations of each principle.

Feedback processes

Dynamic systems self-organize through the interplay of two basic mechanisms: positive and negative feedback. Feedback processes have powerful implications for understanding stability and change in developing systems. *Positive feedback* is the means by which interactions among system elements amplify particular variations, leading to the emergence of novelty. Through *negative feedback*, elements remain linked, deviations are dampened,

and stability is realized. Dynamic systems develop and become more complex through the interaction of both feedback processes; positive feedback catalyzes hierarchical reorganization in response to environmental changes and these new organizations are maintained through the self-stabilizing properties of negative feedback (e.g., Prigogine & Stengers, 1984).

Feedback on both real- and developmental-time scales may be the mechanism by which novel parent–adolescent interaction patterns emerge, develop, and stabilize. As discussed earlier, figure 4.1 illustrates the feedback relations between real-time patterns (micro-social processes) and developmental ones (ecological adaptations) that are expected to give rise to particular adolescent outcomes. In terms of feedback on the real-time scale, several socialization theorists have used this principle to describe dyadic processes, such as mother–infant vocalizations, deviancy training, coercion, and bullying relationships (e.g., Dishion et al., 1996; Maccoby & Martin, 1983; Patterson, 1982, 1995; Patterson & Bank, 1989; Pepler et al., 1999; Wilson & Gottman, 1995; see Granic, 2000, for a review). However, the explanatory power of feedback may best be realized when framed within the larger DS metatheoretical package. For instance, although feedback processes have been discussed by several theorists interested in the family, most have focused exclusively on the self-stabilizing mechanism of negative feedback (e.g., Bell’s control model, Bell, 1968; Bell & Chapman, 1986; and systems theorists’ cybernetic models, Minuchin, 1974; Robin & Foster, 1989).

Positive feedback, however, may be the mechanism by which new variations in the parent–adolescent relationship (e.g., new interpersonal goals, growing cognitive abilities) become amplified and result in new styles of relating (e.g., more egalitarian, cooperative relationships). We discuss these processes in detail later, but for now, consider the example of a parent relinquishing control and allowing her adolescent to take responsibility for a particular family decision. If the adolescent is perceived to have successfully negotiated this opportunity, the parent may be more likely in the future to ask the adolescent for help and, in turn, the adolescent may feel more competent to rise to the challenge. Thus, one critically timed event may become amplified through positive feedback processes resulting in a qualitative shift toward a more egalitarian parent–adolescent relationship. As shown in table 4.1, this is an example of positive feedback on a developmental scale.

Multistability

Through feedback among lower-order (more basic) system elements, stable patterns of interactions emerge; they are referred to as *attractors* in DS terminology. Novel attractors emerge through positive feedback and they stabilize and are maintained by negative feedback. Attractors may be understood as absorbing states that “pull” the system from other potential states. Behavior moves toward these attractors in real time. Over developmental time, attractors represent recurrent patterns that stabilize and become increasingly predictable. As noted by Thelen and Smith (1994), all developmental acquisitions can be described as attractor patterns that emerge over weeks, months, or years.

As recurring stable forms, attractors can be depicted topographically as valleys on a dynamic landscape. The deeper the attractor, the more likely it is that behavior falls into

it and remains there, and the more resistant it is to small changes in the environment. As the system develops, a unique *state space*, defined as a model of all possible states a system can attain, is configured by several attractors. Living systems are characterized by *multistability* (Kelso, 1995); that is, their state space (i.e., behavioral repertoire) includes several coexisting attractors.

Recurrent patterns of parent–adolescent can be conceptualized as dyadic attractors on a state space that represents the range of dyadic interactions that are possible. At any one time, a number of attractors on this state space may be available to a dyad; contextual constraints probabilistically determine the attractor toward which a dyad will move (Fogel, 1993; Fogel & Thelen, 1987). The concept of multistability suggests that all parent–adolescent dyads are characterized by a landscape of diverse attractors (e.g., playful, coercive, neutral) and that these attractors are related to one another. Thus, the emphasis moves from the more conventional, trait-focused approach of observing either negative or positive interactions exclusively to the recognition that a variety of interaction patterns characterize any one dyad. From this alternative perspective, not only can we ask what the attractors are in a particular parent–adolescent dyad's repertoire, but also, under what specific conditions does this system move from one type of attractor (e.g., cooperative) to another (e.g., conflictual). These ideas will become clearer when we look at potential candidates for dyadic attractors in the next section.

Interdependent time scales

The third DS premise we highlight is the interplay between different time scales. Self-organization at the moment-to-moment (real-time) scale constrains self-organization at the developmental scale which, in turn, constrains real-time behavior (van Gelder & Port, 1995). The notion of interdependent time scales suggests that developmental parent–child patterns arise from real-time interactions that recur and stabilize. As these patterns recur, they produce deeper attractors on a dyadic state space. Consequently, based on prior experience, the likelihood of a parent and child interacting in one of a limited number of ways is increasingly predetermined. Generally, this stability is maintained until the system undergoes a phase transition.

Phase transitions

The final, and most critical, principle of dynamic systems for our current purposes is their tendency to exhibit discontinuous or nonlinear change. Through the amplification properties of positive feedback, fluctuations in the organizational structure of a dynamic system can be observed. These fluctuations have the potential to resolve into abrupt changes, or *phase transitions*, and they occur at *points of bifurcation*, or junctures in the system's development.

At these thresholds, small variations have the potential to disproportionately affect the status of feedback among system elements, leading to the emergence of new forms. Novelty does not have to originate from outside the system; it can emerge spontaneously through

feedback within the system. At bifurcation points, systems are extremely sensitive, adapting rapidly to both internal and environmental perturbations. Between these points, however, dynamic systems tend toward coherence and stability (Prigogine & Stengers, 1984). The family system may cross several bifurcation points along its developmental trajectory and early adolescence may be one of its most dramatic (Granic, 2000).

Modeling adolescence as an instantiation of a phase transition has particularly compelling implications. Phase transitions are characterized by a dramatic increase in variability and flux; adolescence is second only to infancy in terms of the massive reorganization that occurs in multiple domains. In the sections that follow, we specify the various intra- and interindividual processes that transform radically at this bifurcation point and speculate about the implications for the family system.

Applying DS Principles to Intraindividual and Interpersonal Processes

Like other systems theorists, we contend that the family system, itself comprising several dyadic systems (e.g., father–daughter, mother–son, father–mother), represents a fundamental unit of analysis. In order to understand these relationships, we may first need to examine the intraindividual (emotional and cognitive) systems that underlie them. Past research has uncovered several intraindividual processes (e.g., cognitive maturation, puberty), interindividual processes (e.g., emotional closeness, communication patterns) and a number of contextual factors (e.g., socioeconomic status, ethnicity) that seem essential for understanding the parent–adolescent relationship. But these insights have remained largely unintegrated; a coherent model that can explicate the connections among these various findings is needed.

Intraindividual processes

Cognitive development in early adolescence can be characterized as a discontinuous reorganization toward a higher level of complexity – a phase transition with profound implications for the parent–adolescent relationship. Although a detailed discussion of these cognitive changes is beyond the scope of this chapter (for reviews, see chapter 11 in this volume; Graber & Petersen, 1991; Keating, 1990b), several key points should be highlighted. Early adolescence marks the onset of formal operational thinking (e.g., Inhelder & Piaget, 1958). In contrast to earlier stages of development, the adolescent acquires the capacity to think abstractly – she or he is able to plan step-by-step activities toward a future goal, hold in mind and manipulate abstract concepts, and develop and test personal theories about the world around him or her.

One result of developing increasingly abstract thinking skills is that the adolescent becomes preoccupied with understanding the self in relation to others. She begins to reflect on the multifaceted components of her personality. She is able to see herself as charming and low-key with her father, angry and rebellious with her mother, vivacious

and fun-loving with her friends, and sometimes sullen and depressed by herself. All these aspects of personality begin to be understood as parts of one integrated self – it is as if the adolescent recognizes for the first time the multistable nature of his or her state space (table 4.1). Parental figures also become de-idealized and multifaceted during this time (e.g., Steinberg, 1990). The adolescent discovers that her parents can often be wrong in their opinions, that their views can be inconsistent, and that they often endorse beliefs and values that are contrary to other parents' views.

These shifts in thinking styles must be intricately linked to emotional processes; a large body of evidence has accrued showing that emotion and cognition are inseparable across the lifespan (e.g., Lewis, 1995; Siegel, 1999; Sroufe, 1995). Neuroscientific evidence has emerged that suggests that the brain undergoes massive reorganizations during adolescence, particularly in the prefrontal cortex and limbic regions (for a review, see Spear, 2000). Spear's and others' work suggests that the adolescent's brain seems to function more "emotionally" during this transitional phase. The regulation and resolution of emotional experiences seem to be central tasks of adolescence and yet these processes have rarely been examined on a fine-grained level. This is surprising, given the central role that emotions have been given in human development in general and parent–child relationships in particular (for a review, see Granic, 2000; Maccoby & Martin, 1983; Schore, 1994). To begin speculating along these lines, we borrow a number of insights from the emotional development camp.

Emotional development theorists have suggested that emotions and cognitive appraisals are the basic psychological elements that interact to form global personality structures (e.g., Izard, 1977; Lewis, 1995; Tomkins, 1987, 1991; Magai & McFadden, 1995; Malatesta & Wilson, 1988). Emotions are elicited from cognitive evaluations of events *relative to an individual's personal goals* (Frijda, 1986; Lazarus, 1982, 1984). Conversely, and bidirectionally, emotions focus an individual's attention on certain aspects of a situation, prompting changes in action readiness (Frijda, 1986). Thus, anger is elicited when a goal is perceived to be intentionally blocked and appraisals of blame are elicited, sadness emerges when a blocked goal is appraised as insurmountable, shame is elicited when the goal of being admired is thwarted and appraisals of worthlessness are triggered, and so on. Over developmental time, recurrent emotion–cognition amalgams sensitize the individual to particular ways of processing information and engaging with the world (Izard, 1977; Lewis, 1995; Malatesta & Wilson, 1988).

Bidirectional influences between cognitive processes and emotion have been conceptualized as a feedback loop (e.g., Lewis, 1995, 1997; Teasdale, 1983; Teasdale & Barnard, 1993). Lewis's model (1995, 1997), based on DS principles, is particularly relevant. He posits that positive feedback between emotion and cognition is the basis for self-organizing personality development. Appraisals are conceptualized as emerging in coordination with emotions, each amplifying the other in real time (figure 4.2).

According to this view, from moment to moment, emotion focuses an individual's attention on particular goal-relevant elements in a situation. An appraisal forms, further generating emotion, which is in turn fed back into the system through repeated iterations. Stable personality structures, conceptualized as attractors, develop as recurring personal goals are blocked or partially blocked, and specific appraisals and emotions arise and persist over similarly frustrated occasions (Lewis, 1995, in press).

Table 4.1 Definitions and Examples of Dynamic Systems Principles

<i>Dynamic system (DS) principles</i>	<i>Definition</i>	<i>Psychosocial examples</i>
Feedback processes <i>Positive feedback</i>	Self-amplifying mechanism in which two or more processes influence each other, giving rise to novel patterns	<ol style="list-style-type: none">(1) Real time: while talking with a peer, an aggressive adolescent introduces an antisocial topic (e.g., lying to parents), peer laughs, the aggressive youth joins in the laughter and brings up increasingly more antisocial topics (stealing, drugs), and the conversation culminates in an excited plan to rob a store(2) Developmental time: parent allows adolescent to have a party with no supervision, adolescent acts responsibly (makes sure no one drives drunk, cleans the house afterwards), parent is reassured of adolescent's competence, adolescent is given increasingly more freedom, adolescent responds with increasing responsibility, and a more egalitarian relationship arises
<i>Negative feedback</i>	Self-stabilizing mechanism in which two or more processes influence each other by minimizing or dampening variations	<ol style="list-style-type: none">(1) Real time: Bell (1968) control model; parent and child have upper and lower limits of tolerance for the intensity, frequency, and acceptability of specific behaviors; when the upper limit of one member of the dyad is approached by the other, the former attempts to change or redirect the other's intolerable behavior; when the lower limit is reached, attempts to stimulate the other are initiated so as to maintain a state of equilibrium(2) Developmental time: a parent starts with a lax limit-setting strategy with no curfew, the adolescent comes home later than she promises, the parent responds by stricter limits with an early curfew, the adolescent begins to come home on time and to act more responsibly by calling when late, the parent responds by loosening the rules, the adolescent comes home on time generally, but when she is late, the parent again responds by setting a stricter curfew

Multistability

Characteristic of all living systems; property describing a system with several coexisting stable states

Attractor

An absorbing state that a system is drawn toward, predictably from a range of nearby states

State space

A model of all possible states a system can attain; the repertoire of available states for a given system

- (1) Intraindividual: an adolescent girl may wake up one day feeling vivacious and fun-loving, by lunchtime, she may be in a lonely and sullen attractor and she may go to bed that night in an angry, rebellious attractor; each of these states are personality configurations that make up this girl's intraindividual state space

- (2) Interindividual: a parent and adolescent may be in a cooperative and loving dyadic attractor when cooking together; they may move to an angry and coercive attractor when discussing curfew, and a neutral dyadic state when watching television together; all of these interaction styles are part of this dyad's behavioral repertoire, or dyadic state space

Interdependent time scales

Real-time (moment-to-moment) interactions among system elements lay down developmental patterns which, in turn, constrain the nature of the real-time activities of system elements

On a real-time scale, a parent demands that her adolescent boy help with the dishes, the boy refuses, she insists, he threatens to run away, she withdraws her demands, he stays home; over many similarly repeated occasions, coercive dyadic habits stabilize in development, increasing the likelihood that the boy will refuse and the mother will acquiesce; this dyad will also be increasingly less likely to engage in cooperative exchanges

Phase transition

A nonlinear, discontinuous change in the organizational structure of a system; characterized by a temporary increase in variability in real- and developmental time

- (1) Real time: family interactions in early adolescence may be characterized by many different mood states and rapid moment-to-moment transitions between one emotional state and another
 - (2) Developmental time: early adolescence is marked by major reorganizations in multiple domains (biological, cognitive, social); this transition period is sandwiched between stable periods during which development proceeds relatively unperturbed
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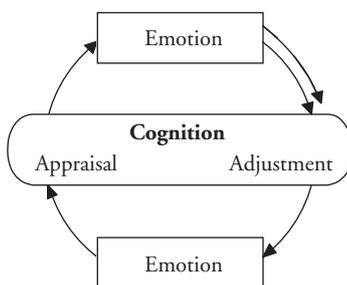


Figure 4.2 Positive feedback in cognition–emotion (adapted from Lewis, 1995).

Critical for our modeling purposes is the idea that feedback between emotion and cognition is always in relation to a goal. What sorts of goals might be relevant for the early adolescent? A number of theorists have suggested at least two macro-goals: identity formation (e.g., Erikson, 1968; Kroger, this volume) and autonomy from parents (Collins et al., 1997; chapter 9 in this volume). Subsumed under these broad developmental goals might be more immediate subgoals, including the need to be accepted and admired by the peer group, the need to participate in romantic relationships, and the desire to be recognized and respected by parents and other authority figures.

We propose that many of the adolescent’s most important micro- and macro-goals are *interpersonal* in nature (e.g., to be trusted by parents, to be accepted by peers). The day-to-day pursuit of these goals fashions unique affective–cognitive structures which go on to constrain developmental patterns as personality consolidates. To clarify this argument further, we need to move to a discussion of interpersonal processes.

Interpersonal processes

Development does not proceed in a vacuum. Quite the contrary, development is fundamentally a relational process (e.g., Fogel, 1993; Fogel & Thelen, 1987; Granic, 2000; Laible & Thompson, 2000; Patterson & Reid, 1984; Schore, 1994). To understand adolescent development in the context of the family, we extend Lewis’s individual personality model (1995, 1997) and argue that the separate affective–cognitive structures of the parent and the adolescent are the interacting subsystems that self-organize in dyadic interactions.

Through repeated feedback cycles, particular parent and adolescent affective–cognitive couplings may reciprocally select one another and become further coupled into a qualitatively more complex dyadic configuration (figure 4.3). Over time, the parent–child dyad develops a repertoire of various relational states, each accessible in certain contexts and not in others. A unique parent–adolescent state space may be one way to represent the range of possible interaction patterns toward which dyadic self-organization can evolve in real time (see table 4.1 for review). It can also inform us of the developmental history of that parent–adolescent system.

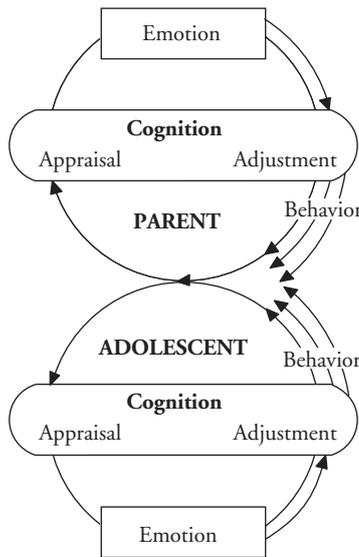


Figure 4.3 Parent–adolescent interacting feedback loops (adapted from Lewis, 1995).

Research on cognitive–emotional processes in parenting is one way to ground the notion of intercoupled parent and adolescent attractors and frame dyadic self-organization in terms of goal-relevant behaviors. Prior to adolescence, socialization in childhood often involves the clash of incompatible goals (Grusec, Rudy, & Martini, 1997) and invariably these processes are emotional (Dix, 1991): Parents want children to get enough sleep or to clean up their room, which may be incompatible with children’s wishes to stay up late or watch television. The specific emotions involved in these conflict episodes may depend, in part, on the parent’s short- and long-term goals (Kuczynski, 1984), the parent’s appraisals of why the child is compliant or not, and the degree to which she controls these outcomes (e.g., Abramson, Seligman, & Teasdale, 1978; Dix, 1991; Hastings & Grusec, 1997, 1998; Weiner, 1979).

The direction of influence may be extended to the child or adolescent, as well. The extent to which a teen is angry at her mother for not letting her stay out late may depend on appraisals of why the parent is being so rigid and the degree to which the youth feels she has control over the situation. For each partner, the perception of the other’s goal-facilitating or blocking behaviors may promote coupling between his or her emergent attractors.

There is some empirical support for this dyadic attractor model. Pappalardo and Maccoby (1985) have shown that children comply more with parental commands if the parent previously complied with the child’s directives. This work suggests reciprocal coupling of cognitive–affective structures. In terms of adolescent issues, it may be that teenagers who perceive their parents as furthering their goals (e.g., letting them drive the car) feel positive emotions which feed back with appraisals of the parent as a cooperative and supportive partner. This affectionate–supportive attractor may be expressed behaviorally by complying with the parent’s next demand (e.g., to bring the car back at a specific time).

The teen's responsible behavior, in turn, may trigger goal-facilitating appraisals and positive emotions in the parent. This parent–adolescent pattern may stabilize over development, providing the context in which mutual socialization goals may be realized.

Alternatively, Patterson, Reid, & Dishion (1992) have found a different interactional pattern characterizing clinically referred families. Their research shows that an aggressive child experiences an aversive intrusion from a family member at least once every minute (Patterson, 1982, 1995). In response, the child tends to be noncompliant and counterattacks by arguing and whining. After years of similarly repeated disciplinary attempts, a mother may develop an affective–cognitive structure, characterized by anger and appraisals of her child as obstinate and inherently “bad” (Granic, 2000). Simultaneously, the child may develop his own compatible cognitive–emotional configuration, constituted by anger and attributions of his mother as hostile and unfair (MacKinnon-Lewis et al., 1992). Through repeated interactions, their two attractors may become linked in a feedback loop such that the mother's attractor and the behavior with which it is expressed “pulls for” her son's angry attractor and the behaviors to which it is linked. Each member's behavior amplifies the other's anger and accompanying appraisals, coalescing into a hostile dyadic attractor.

Most importantly, based on the DS principle of multistability, both supportive/cooperative and coercive attractors may coexist as potential parent–adolescent states. At any one time, the likelihood of arriving at one attractor versus another depends on contextual constraints. The specific contextual factors that will “push” a dyad toward one versus another attractor depends entirely on the developmental history of that family system.

A DS Model of Conflict in Parent–Adolescent Relationships

Summary of past research

The majority of research on family relationships in adolescence has focused on the content and frequency of conflict. Before articulating our DS model of conflict in parent–adolescent relationships, we provide a brief review of these past findings. The history of the conflict literature represents an extreme pendulum swing with contemporary views having come to rest in the middle. At one end are the early psychoanalytic theorists (e.g., Blos, 1962, 1979; Freud, 1937, 1958), who argued that adolescence was a time of turbulence, during which conflict and antisocial behavior were not only normative, but necessary for healthy development to proceed. Among other reasons, the psychoanalytic approach was criticized for having been developed largely on the basis of clinical samples; subsequent research began to focus on more representative, non-clinical samples (Smetana, 1996).

This next body of work directly contradicted the stormy characterization of the adolescent–parent relationship (for recent reviews, see Baumrind, 1991; Collins, 1990, 1995; Holmbeck, 1996; Laursen & Collins, 1994; Laursen et al., 1998; Montemayor, 1986; Smetana, 1996; Steinberg, 1990). Evidence from a series of classic studies (e.g., Kandel & Lesser, 1972; Offer, 1969; Rutter et al., 1976), seemed to indicate that adolescence was largely conflict-free and painless. Only a very small proportion of adolescents in

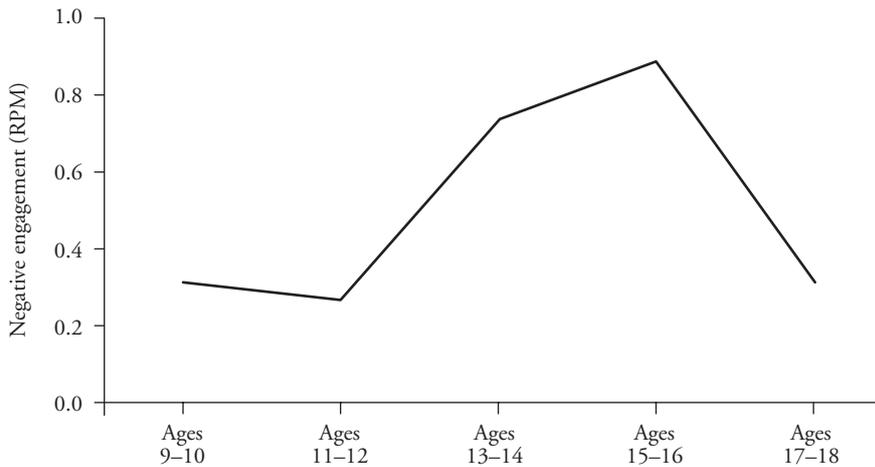


Figure 4.4 Observed rate-per-minute of negative engagement between mother and son across five waves of data collection.

the general population (5–20 percent) were found to experience significant conflict with their parents. Those adolescents who did show extreme levels of conflict in the family were already experiencing relationship difficulties during earlier stages of development (Collins, 1990; Hill, 1987; Montemayor, 1983; Rutter et al., 1976; Steinberg, 1990).

This optimistic view of adolescent–parent conflict also came under attack. A number of researchers (Smetana, 1996; Silverberg et al., 1992; Steinberg, 1987) argued that these studies relied too heavily on global assessments of family functioning that was summarized from questionnaires and interviews. No observations of actual family conflicts were made, nor were reports of daily hassles and arguments collected (Smetana, 1996).

Since the mid-1980s, these criticisms have been largely addressed and contemporary views of the parent–adolescent relationship now fall between the two extreme views (Baumrind, 1991; Smetana, 1996). Recent research has shown that most parents and adolescents maintain a close, affectionate bond during adolescence (e.g., Baumrind, 1991; Hill & Holmbeck, 1986). On the other hand, they share less time together (Csikszentmihalyi & Larson, 1984; Montemayor, 1982) and conflicts do seem to increase in early adolescence, gradually abating over the years (see Laursen et al., 1998, for a meta-analysis; Montemayor, 1983).

In our longitudinal project with the Oregon Youth Study (OYS) boys, we asked the boy and his parent(s) to discuss actual family problems every other year from age 10 through 18 (Forgatch, 1984; Forgatch, Fetrow, & Lathrop, 1985). We coded the 30 minutes of videotape with the Family Process Code (FPC; Dishion et al., 1983), and derived several clusters, including a negative engagement cluster, which primarily defined the family's level of conflict. The rate-per-minute of negative engagement is summarized in figure 4.4 and shows a marked increase in observed mother–son conflict beginning in early adolescence (13–14 years old) and declining after age 16.

An increase in parent–adolescent conflict seemed to be ubiquitous across the sample and did not appear indicative of any particular pathology. We suggest that this increase

in family conflict around puberty (for boys) is developmentally functional in that it provides the context in which issues of autonomy are negotiated. Striving for autonomy is a key developmental task in adolescence (chapter 9 in this volume, 1990; Collins et al., 1997; Hill & Holmbeck, 1986), but it is important to note that autonomy need not, and most often does not, entail a divorce from parental ties. Most adolescents stay connected to the family and recent research has shown that close family relations, or secure attachments, facilitate independence during this transitional phase (Hill & Holmbeck, 1987; Larson et al., 1996). Adolescent maturity is thought to grow from “the balance between agency and communion, between separation and connectedness, and between conflict and harmony” (Baumrind, 1991, p. 120).

This more complex, dynamic view of parent–adolescent relationships seems to call for research that goes beyond examining the frequency and content of conflicts. Parents indeed argue more with their adolescent, but they also stay involved and loving. It is apparent from watching the videotapes gathered in our research that in middle childhood, parents dominated the problem-solving discussion at all levels, from problem definition, to problem solution. In contrast, during adolescence, parents responded to the expanding cognitive and emotion regulations skills of the adolescent by beginning to negotiate and integrate the adolescent’s views and emotional reactions.

What are the specific mechanisms that trigger these types of changes in family interaction patterns? The DS concept of phase transitions is particularly appropriate for addressing this question.

Adolescence as a phase transition

Over the course of childhood, the parent and child develop characteristic ways of interacting with the other – individual personality configurations become more and more entrenched over occasions and, in parallel, dyadic attractors increasingly deepen and become stronger. The developmental result is a highly articulated parent–child state space that has been configured from similarly recurring family interactions, but the transition from childhood to adolescence represents an important perturbation to the family system.

Early adolescence can be viewed as a phase transition – a discontinuous shift – in the parent–child system. The characterization of the transition to adolescence as discontinuous is consistent with psychoanalytic (e.g., Blos, 1962, 1979; Freud, 1937, 1958), socio-biological (Steinberg, 1989, 1990), and cognitive-developmental models (Selman, 1981; Smetana, 1988; Youniss, 1980; for a review and an alternative perspective, see Laursen & Collins, 1994). According to DS principles, when the parent–child system reaches this bifurcation point, there is a temporary increase in the potential for new dyadic attractors to arise.

The specific types of novel interaction patterns that self-organize through this phase shift will depend partially on previously established structures – the history of that parent–adolescent relationship. But the relational system is also highly sensitive to fluctuations at this threshold of instability. The increase in degrees of freedom may mean that minor incidents (e.g., the parent allows her adolescent to make a small family decision,

the youth begins to drive a car) can result in a cascade toward a major change in the parent–adolescent system.

Particularly during this early adolescent phase transition, conflict episodes may represent a rich microcosm through which novel parent–adolescent attractors emerge and stabilize. Whereas the power differential in childhood ensured that parental goals held most of the weight, this assumption becomes less clear as the adolescent grows older and vies for power and for legitimizing his or her own personal goals. Thus, there are far more opportunities for the parent to act as a goal-blocking agent for the adolescent.

A great deal of empirical and theoretical work supports the idea that early adolescence begins a period of shifting power dynamics, which may give rise to competing goals and result in a higher density of conflict episodes. Smetana (e.g., 1988, 1989, 1991) has shown that, as a result of domain-specific cognitive maturation, the issues adolescents previously perceived to be under parental jurisdiction become re-evaluated as personal decisions. Selman (1981) and Youniss (1980), arguing from a more global cognitive development perspective, have suggested that adolescents begin to re-evaluate the hierarchy of family roles and to work toward more egalitarian relationships. Parents, however, often do not share this goal and are reluctant to relinquish their position of authority. Pubertal development (Hill et al., 1985; Steinberg, 1987, 1988), increased time outside the home with peers (Hill, 1987), and observations of how other parents behave are also triggers that may give rise to beliefs and goals that are incompatible with those of parents.

Collins's (1990, 1992, 1995, 1997; Collins & Laursen, 1999) study of discrepant expectancies in parent–adolescent relationships is most relevant to this discussion. He has argued that the rapid nature of changes in multiple domains associated with the transition to adolescence initiates discrepancies in parents' and adolescents' expectations for one another. When interactional sequences are interrupted by behaviors that violate expectancies "conflict and emotional arousal occur" (Collins, 1992, p. 179). Collins's research has shown that discrepancies in expectations are greatest during early adolescence, compared with pre- and late adolescence (e.g., Collins, 1990, 1992, 1995; Collins & Laursen, 1999).

From a DS perspective, early adolescence constitutes a bifurcation point characterized by disequilibrium, which is in large part driven by changing and conflicting goals and the emotions they elicit. These changes provide numerous goal-blocking opportunities which, in turn, provoke conflict. In some cases, these conflict episodes may drive family members to reassess and "realign" their beliefs and goals to match the maturing needs of the adolescent (Collins, 1992). Particularly resonant with the DS approach, Collins refers to this transitional phase as a time for the "reestablishment of equilibrium" (p. 179). Upon passing through this phase transition, a new landscape of relational possibilities may stabilize for the family system.

A clear link exists between Collins's notion of expectations and our emphasis on goals. In some of Collins's work (e.g., 1992), he explicitly defines socialization goals as one type of expectancy. Although his notion of expectancies in family relationships has been central in our thinking, we prefer the concept of goals for the following reasons. First, as described earlier, the notion that cognitive–emotional processes function in the service of goals is a general principle that has been well-established in the emotional development literature. Second, expectancies can be considered "passive" or "active." One can expect the

sun to rise every day, but that may not impact on behavior in any meaningful way. Active expectancies may be better conceptualized as goals – they direct behavior. Third, Collins's assertion that when expectancies are violated, conflict and emotional arousal are triggered seems too general to us. It is only when expectancies are higher or more positive than actual behavior that conflict has a chance to occur. For example, based on his own adolescence, a parent may expect his son to stay out past curfew and get caught drunk a few times during his teenage years, but his son may not be predisposed to act out in this way. In this case, a violation of expectancies may induce feelings of pride or perhaps even concern, but these emotions would not necessarily lead to conflict.

Thus, while maintaining the main gist of Collins's framework, we suggest that goals may provide a more specific term that helps us to model the cognitive–emotional organizations underlying parent–adolescent conflicts. Further, we propose that DS principles provide the mechanisms by which discrepant goals give rise to conflict. Specifically, at points of bifurcation, conflict episodes may trigger new emotion–cognition configurations for each dyad member which, through the amplification properties of positive feedback, may underpin the emergence of new parent–adolescent patterns.

As mentioned previously, a great deal of research has focused on the degree to which these parent–adolescent relationships are conflictual. With a DS approach, we can move this question forward considerably. For example, we can ask *process-level* questions regarding the temporal unfolding of these episodes: Under what conditions do some dyads “fall into” a hostile attractor versus other available attractors? How long do they remain there and how easily can they move out of the hostile attractor to a more amiable, cooperative one?

We can also inquire about the developmental course and *function* of these interaction patterns: By what processes does conflict trigger the reorganization of previously stable patterns of relating, and when do these new patterns become crystallized? Does a dyadic state space with many available attractors imply a more “adaptive” relationship, versus one that is more “rigid” and configured by only a few attractors? Finally, we can examine changes in the *organizational structure* of parent–adolescent interactions: What does a developmental transition look like in terms of parent–adolescent interactions, and how can we characterize the restabilization of family relationships? In other words, how do the family relationships of young adolescents reorganize in such a way as to accommodate more negativity and conflict while remaining warm and secure? We have recently become particularly interested in addressing this last set of questions.

Our aim was to extend past research on the content and frequency of conflict during this transitional phase by studying changes in the *organizational structure* of family interactions. According to our DS-inspired model (Granic, 2000), over the course of childhood, the parent and child develop characteristic ways of interacting with the other. The result is a highly predictable parent–child system which has been configured from many similarly repeated family interactions. For some families, these stable patterns may be characterized generally as supportive and warm. For other families, coercive (Patterson, 1982) patterns may have stabilized over time, and for still others, withdrawn and sad dyadic interaction styles may have emerged. Regardless of their content, however, at the onset of the phase transition – as underlying reorganizations in multiple domains are occurring – the family behavioral system undergoes a period of reorganization as well.

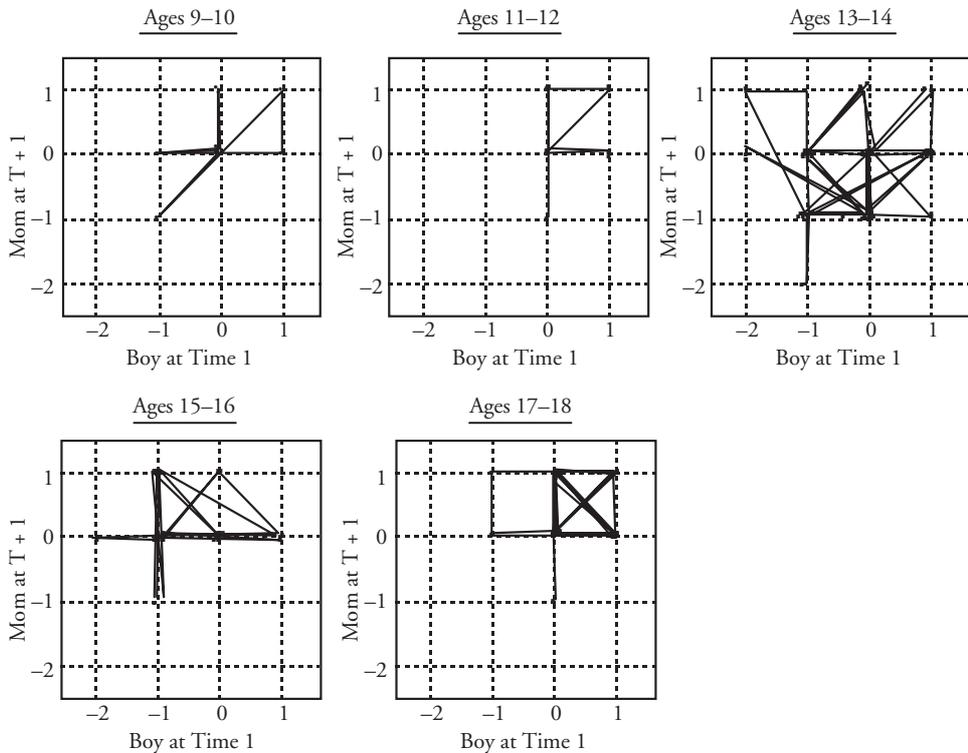


Figure 4.5 State space grids for one OYS family, across five waves of observation.

This period should be characterized by an increase in the variability of dyadic patterns: behavioral states should change frequently from one type to another (e.g., from playful to hostile interactions, from teasing to withdrawn behaviors). After the phase transition, the parent–adolescent system should return to a more stable, less flexible behavioral landscape.

As a preliminary step toward tracking these changes, we used a variation of Lewis and colleagues’ (1999) state space grid method. Inspired by a DS framework, this method offers an intuitively appealing way to view the unfolding of complex, interactional behavior by displaying how behavior clusters in certain regions of a state space and changes over time. For this study, state space grids were particularly useful for depicting the relative stability and flexibility of dyads’ behavioral repertoires.

The study, based on a subsample of OYS boys, involved 61 dyads who engaged in problem-solving discussions. Each conversational turn was coded with the FPC, which were subsequently collapsed into a 4-point scale (−2 = hostile, −1 = negative, 0 = neutral, and +1 = positive). Figure 4.5 shows the state space grids for one dyad’s problem-solving sessions over five waves of data collection (every other year from ages 10 to 18). The x-axis of the grids represents the child’s behavior at lag 0 and the y-axis represents the parent’s behavior that followed (lag 1). The numbers on the axes represent the coding

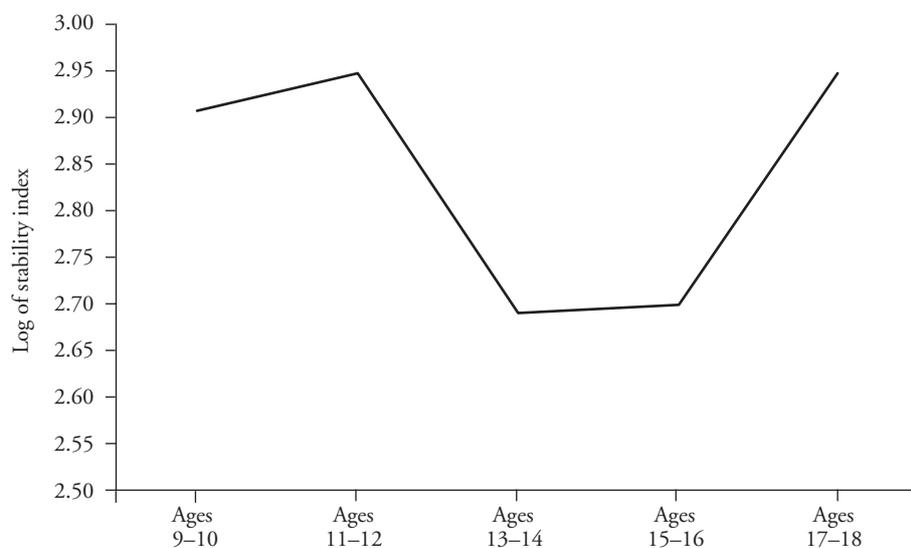


Figure 4.6 Logged “stability index” for the full sample across five waves of data collection.

categories. Each point on the grid represents two conversational turns (a dyadic state) and the line represents the behavioral trajectory across time. For our current purposes, it is particularly important to note the dispersion of behavior across the cells of the state space grid.

Figure 4.5 illustrates a sequence of grids for one dyad; a pattern characteristic for many of the families in the sample. The grids showed that dyadic behavior during early adolescence (ages 13–14 for boys) looked more flexible (less stable) than either the period before or after. In the first two waves, the dyad in figure 4.5 “visited” relatively few cells; they remained generally in the mutually neutral regions, with a few forays into the mutually positive region and one or two negative turns. In contrast, during the third wave, dyadic behavior became much more variable; almost every region of the state space was visited at least once. After this transitional phase, the grids for the next two waves indicated a restabilization or, in Collins’s terms, a “reestablishment of equilibrium.” Thus, inspection of the grids provided preliminary support for our hypothesis that early adolescence represents a phase transition marked by increased variability in dyadic behavior.

To begin quantifying the impressions gathered from the grids, we calculated a “stability index” for each dyad at each wave. We simply counted the number of conversational turns and divided by the number of cells visited: The higher the number, the more stable (i.e., the less variable) the behavioral pattern on the state space grid. Figure 4.6 illustrates the logged results for the sample as a whole. As expected, a quadratic pattern was revealed, indicating that dyadic behavior became considerably less stable (more variable) at ages 13–14.

Although we are only at the preliminary stages of our analyses, and we are still in the process of developing more sophisticated analytic strategies, we are encouraged by the results yielded by this new DS methodology. In future research, we plan on further

examining the organizational structure, in conjunction with the content, of these patterns to examine more closely the process by which early adolescence ushers in a period of disequilibrium.

Mutual Constraints Among Hierarchical Levels and Relationship Systems

Constraints between intra- and interindividual processes

The systemic concept of hierarchical integration is critical for understanding adolescent development in the context of the family. We have considered how intraindividual attractors seem to couple to form particular dyadic attractors, but it is important to note that these dyadic patterns constrain the very individual structures by which they are constituted. This means that as the adolescent develops, his or her unique personality state space is partially configured by the dyadic attractors in which he or she participates.

Consider, for example, Steinberg's (1988) evidence that shows that emotional distance and conflict in the mother–daughter relationship accelerates pubertal maturation, while a close relationship postpones such development. From a DS perspective, this seems to be a compelling instance in which dyadic attractors (i.e., conflictual patterns) constrain the features of intraindividual biological processes (i.e., onset of puberty). Particular patterns of family relations have also been shown to influence adolescent ego development and to foster advanced levels of identity exploration (e.g., Brooks-Gunn, Graber, & Paikoff, 1994; Steinberg, 1990).

Similarly, peer relations may also influence intraindividual processes in profound ways. One example may be seen with antisocial adolescents and their peer systems. In distressed families, antisocial boys are likely to seek the company of peers, specifically antisocial peers, at earlier ages (see chapter 22 in this volume; Dishion et al., 1995b, 1996, 1997; Patterson et al., 1992). Compared with their normative counterparts, antisocial boys tend to have a series of short-term friendships with like-minded antisocial peers. How might these relationships influence adolescents' intraindividual development?

According to Piaget (1965), one of the main functions of peer interactions in adolescence is to induce conflict which, in turn, is thought to trigger intraindividual cognitive disequilibrium. This internal cognitive conflict leads to the eventual development of more sophisticated thinking skills. But because antisocial boys are likely to terminate their friendships immediately after conflicts arise, many of them may never reach this state of cognitive disequilibrium. In fact, programmatic studies of friendship interactions have established that antisocial boys spend a great deal of their time engaging in deviant talk organized through positive affective exchanges (Dishion et al., 1995a, 1996, 1997). We argue that, far from inducing conflict, these interactions serve to reinforce antisocial beliefs and attitudes among like-minded adolescents. As a result, the serial "hopping" from one antisocial friend to another may impinge upon, or retard, conceptual sophistication by failing to induce conflicts that members feel obliged to resolve amiably and productively.

Constraints between parental and peer relationships

Not only do hierarchically embedded system levels exert mutual influences over one another, but relationship contexts are also mutually embedded and reciprocally influential (Bronfenbrenner, 1989; Hinde, 1989). Particularly relevant during the adolescent phase transition are the bidirectional constraints between family and peer systems. For example, for attachment theorists, the adolescent is considered to have developed an internal working model (a representational template of the primary relationship) that forms the basis for the types of interactional/ relationship patterns that are developed with other partners (Allan & Land, 1999; Hartup & Laursen, 1999; Reis, Collins, & Bersheid, 2000). The securely attached child who learned to trust his environment and rely on support from the caregiver during times of stress is expected to develop relationships with peers that are similarly characterized by trust and support (e.g., Allan et al., 1998; Allan & Land, 1999; Zimmermann, Scheuerer-Engelisch, & Grossmann, 1996).

Feedback processes over developmental time between the family and peer systems may not only reinforce old relational styles like the example given above, they also may catalyze major changes in one or both relational systems. For instance, early pubertal development is associated with increased parent–adolescent conflict, particularly for girls (Steinberg, 1988). Increased conflict in the home may prompt early maturing daughters to spend more time away from the home with peers. These girls are most likely to belong to a peer group that includes older boys (Magnusson, Stattin, & Allen, 1985). This increasing attention from males may prompt girls to dress more maturely and become sexually active at a younger age (Dishion et al., 2000). In turn, parent–adolescent conflict may become amplified as the parent becomes increasingly concerned about her daughter's well-being and the adolescent feels she is unable to express her individuality. Over these developmental feedback cycles, mother and daughter may become increasingly angry and resentful toward one another, each perceiving the other as impinging on critical interpersonal goals. Thus, through developmental feedback processes, relationships with family and peers reciprocally shape one another.

Ecological considerations

Although parenting practices are central to our understanding of adolescent development, it has become clear throughout our discussion that the adolescent's socialization context reaches beyond the home. In this final section, we broaden our discussion to consider the community and cultural contexts within which the adolescent's family and peer system is embedded. As many investigators have noted, most of what we currently understand about parent–adolescent relationships has come from research on white, middle-class, intact families (e.g., Collins, 1995; Hill, 1987; Holmbeck, 1996; Paikoff & Brooks-Gunn, 1991; Sessa & Steinberg, 1991; Spencer & Dornbusch, 1990; Steinberg, 1990; Steinberg et al., 1995). Fortunately, results from recently conceived ecologically-based research agendas have begun to paint a much more rich and complex picture of adolescent development (e.g., Deater-Deckard & Dodge, 1997; Dishion et al., 1995b; Dishion & Bullock, in press; Steinberg et al., 1995; McLoyd, 1990).

For example, Steinberg and colleagues (1995) launched a programmatic study of the adolescent's family in broader contexts. Instead of controlling for demographic variables, these researchers set out to systematically examine how parent-adolescent relationship patterns vary across different ethnic groups and socioeconomic levels. They were also interested in investigating the processes through which peer relationships moderate family influences. Not surprisingly, their results were complex. Authoritativeness was found to vary across different ecological niches (i.e., it was most prevalent in European American, middle-class, intact families), but the effects of authoritativeness varied to a much lesser extent. Across ethnic, SES, and family structure contexts, adolescents raised in authoritative homes were more self-reliant, less depressed and less likely to engage in delinquent activity.

In terms of scholastic achievement, however, African American and Asian American youth raised with authoritative parents performed no better than those who were not. To understand these results, Steinberg and colleagues turned to the peer group. The influence of peers versus parents on school performance was found to be relatively more powerful for minority than European American adolescents. A link between parenting practices and adolescent personality traits was discovered, and these traits, in turn, predicted membership in different types of cliques (antisocial or prosocial), however, *these associations were not evident for minority youth* (see also Cairns et al., 1988; Dishion & Bullock, in press). The authors suggested that minority youth are much more restricted in terms of their choices of peer groups and may often have difficulty joining an academically strong clique. For example, although African American parents encourage academic success (they score among the highest on measures of parental involvement in school), the influence of a less academically-minded peer group may offset these family influences.

Steinberg and associates also found some intriguing neighborhood effects. For instance, results revealed that a family's social integration within a neighborhood is related to scholastic achievement and the lack of antisocial behavior. However, these findings only hold when the neighborhood in which the family is well integrated is characterized by a high proportion of families exhibiting good parenting. Taken together, these findings suggest that the impact of authoritative parenting on adolescent development is far more complex than previously conceptualized.

Much of this work is based on global reports of parenting practices. In our own work, we have completed macro ratings of family management practices based on in-home videotaped interactions among successful and high-risk European American and African American families with adolescents. Figure 4.7 shows the results for the parenting construct we labeled "limit-setting." Our findings revealed that the covariation between limit-setting and the youths' status as successful or high risk (as defined by teachers) was exactly the opposite for each cultural group (Dishion & Bullock, in press). There was a statistically reliable interaction between risk status and ethnic group. As expected, high scores on the macro ratings of parent limit-setting characterized successful, and not high-risk, European American families. This was expected, given the measure was based on 20 years of research with primarily European American families (e.g., Patterson, Reid and Dishion, 1992). Paradoxically, however, low scores on observations of parental limit-setting were characteristic of successful African American families, not the high-risk families.

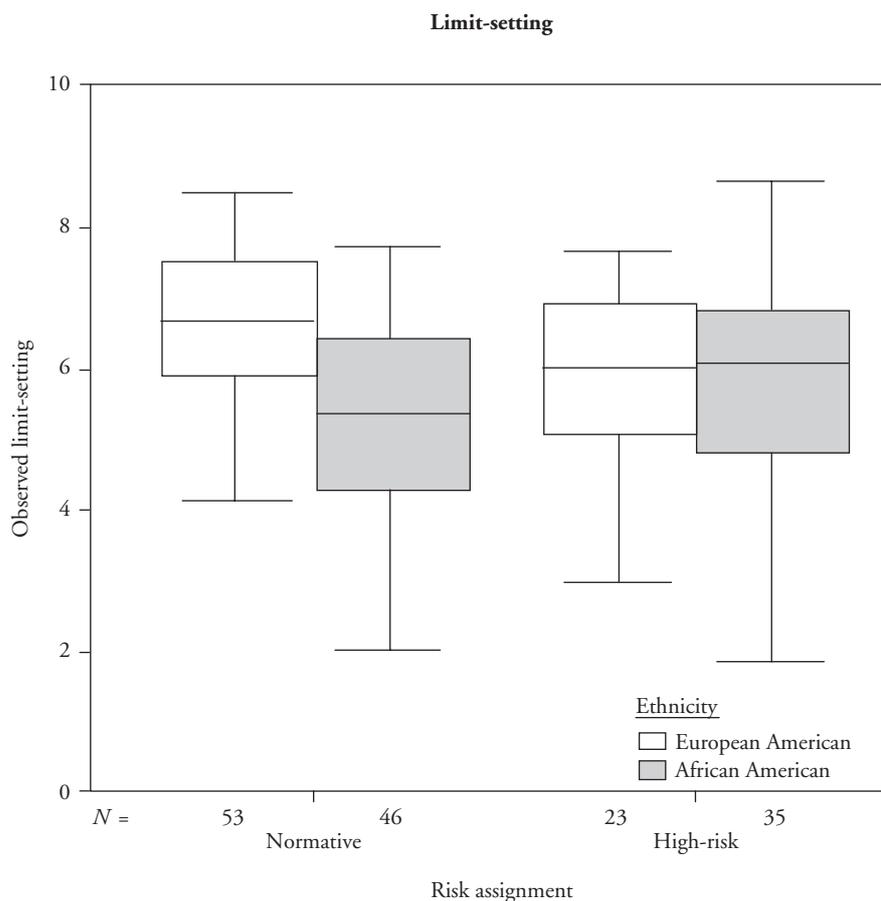


Figure 4.7 Limit-setting by ethnicity.

The principal explanation for this finding is that our measures of parenting were ethnically biased; that is, a firm, strict parenting style meant something different in the African American community than it did for the European American community. Our measures tapped the extent to which explicit discussion of family rules and punishment strategies was observed. But perhaps effective parenting among African American families evolves not so much from an explicit laying down of rules and regulations, but from a shared understanding between the adolescent and parent about the form and function of parenting in adolescence (Deater-Deckard & Dodge, 1997). Over many years, families construct a “verbal cocoon” that provides explanations for what are appropriate ways in which members respond to particular behaviors (Dishion & Bullock, in press). This family framework is not easily captured in a 30-minute observation session. Our challenge as researchers is to accurately tap the meaning of these subtle (and perhaps not so subtle) messages that contribute to the diversity of emergent family contexts.

Our proposal that socialization processes are embedded within the meaning attributed by the larger community is buttressed by the important acculturation research. This line

of work suggests that families are strained when the youngsters in the family adopt cultural values that are radically different from those endorsed by the adult caregivers (Masten & Coatsworth, 1995); the shared understanding necessary for smooth socialization is disrupted. Interventions that develop bicultural training enhance parenting potential and reduce problem behavior in adolescence (Coatsworth et al., 1996; Szapocznik et al., 1996).

In the 1800s, the United States adopted a policy that sent Native American youth to boarding schools for “re-education.” The resilient and powerful socialization practices of the Native American communities could only be disrupted by physically sending youth away from their family community into boarding schools where their way of life was challenged at every level, from introducing physical discipline, to forcing them to adopt a foreign language, dress and new set of beliefs (Duran & Duran, 1995). Thus, developmental processes at the intraindividual and interpersonal levels were targeted for change. In addition, multiple levels of the systemic hierarchy including parent–child, peer, teacher–student, community and cultural systems were disrupted. Remarkably, even under these extreme conditions, it took several generations of boarding schools to perturb traditional indigenous socialization practices. Today we witness, as Black Elk predicted, that the seventh generation is rejuvenating indigenous practices. This is a compelling example of how cultural identity underlies community self-organization, and how relatively resilient to countervailing forces individuals embedded in these rich contexts can be, not only during adolescence, but indeed across the life course, and across generations.

Summary and Conclusion

The current chapter represents our preliminary attempts at developing a coherent model of the family ecology during adolescence. We propose that such a model requires a shift both down the systemic hierarchy to considerations of intraindividual factors, and up to the community and cultural levels. We began by introducing a broad ecological framework that served as a heuristic for organizing the various interacting systems which contribute to the transformations in adolescence. Then, in order to be more specific about the underlying causal mechanisms that may be driving these changes, dynamic systems principles were introduced.

In terms of intra- and interpersonal processes, we argued the following:

1. Throughout childhood, specific combinations of emotions and appraisals arise and persist when interpersonal goals are unmet, or partially met;
2. As these similarly frustrating occasions recur, particularly in the family context, specific emotion–cognition attractors stabilize;
3. Early adolescence can be described as a phase transition characterized by increased variability in the system. At this time those early attractor patterns may break down and novel relationship patterns have the potential to emerge;
4. One potential mechanism by which these new family patterns emerge may be related to changing goals. During early adolescence, new interpersonal goals arise for the

- teenager which are likely to be blocked, or partially blocked, by parents; thus, parent–adolescent conflict is likely;
5. Through repeated conflict scenarios during which similar issues are addressed (e.g., curfew, dating practices), positive feedback processes fashion new and unique emotion–cognition attractors;
 6. A finite set of these attractors stabilize after the phase transition (in mid- to late-adolescence) and form the basis of subsequent personality patterns; and
 7. These personality patterns then go on to constrain the types of future interpersonal relationships – family and peer relationships – that develop for the maturing adolescent.

We ended our discussion by returning to the ecological framework and addressing some critical community and cultural factors. Like others before us, we argued that adolescent socialization cannot be conceptualized without broadening our lens to include the peer, community, and cultural processes that reciprocally interact to shape developmental outcomes. In conclusion, we have been inspired by the potential for new insights that has emerged from amalgamating the ecological framework with DS concepts. It seems clear to us that a great deal of exciting future research can be undertaken at the crossroads of these two approaches.

Key Readings

Dishion, T. J., Poulin, F., & Medici Skaggs, N. (2000). The ecology of premature adolescent autonomy: Biological and social influences. In K. A. Kerns, J. Contreras, & A. M. Neal-Barrett (Eds.), *Explaining associations between family and peer relationships* (pp. 27–45). Westport, CT: Praeger.

This chapter explores the integration of evolutionary and social interaction theory in accounting for extreme levels of problem behavior in early to mid-adolescence. It was hypothesized that attenuated relationships with parents and other adults in early adolescence provides a context of vulnerability to peer influences. Peer relationships and interaction patterns are functional during puberty because of the secondary gain of promoting heterosexual relationships. These ideas were confirmed using structural equation modeling with a sample ($n = 220$), showing a combination of poor family management, school failure, and puberty predicting involvement with a deviant peer group, which in turn predicted early sexual intercourse.

Granic, I., & Hollenstein, T. (in press). Dynamic systems methods for models of developmental psychopathology. *Development and Psychopathology*.

This article provides a survey of novel designs and methodological techniques currently being used and refined by developmental dynamic systems researchers. The methodological review is aimed at introducing and encouraging developmentalists and developmental psychopathologists to expand their analytic repertoire with techniques that are more amenable to the study of change. One particularly promising method for the study of family interactions, state space grid analysis, is elaborated and its clinical utility is highlighted.

Lewis, M. D., & Granic, I. (Eds.) (2000). *Emotion, development and self-organization: Dynamic systems approaches to emotional development*. New York: Cambridge University Press.

This edited book was part of the Cambridge series on Social and Emotional Development. The volume includes contributions from leaders in the fields of emotion theory (e.g., Klaus Scherer, John Gottman), emotional development (e.g., Carroll Izard, Linda Camras, Marc D. Lewis, Ross Thompson, Allan Schore), and neuropsychology (e.g., Walter Freeman, Jaak Panksepp, Don Tucker). These scholars and others agreed to participate in this effort to identify and launch what is essentially a new area of specialization. Senior contributors who had not explicitly identified themselves with the dynamic systems approach reconceptualized their work from this perspective, and contributors who have been applying dynamic systems approaches for years summarized their program of research for the volume.

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