Part I

Introduction: Historical and theoretical roots of developmental psychopathology

Dante Cicchetti and Thomas M. Achenbach set the stage for this volume in these first two chapters by examining the historical and theoretical underpinnings of developmental psychopathology. Cicchetti traces the roots of this new discipline in three theories of development, each of which was influenced by Western philosophy and embryology: Freudian psychoanalytic theory, Wernerian organismic theory, and Piagetian structural theory. Cicchetti illustrates how, in diverse disciplines, the study of atypical or pathological populations has served to enrich and confirm the understanding of normal development, particularly in regard to the hierarchically integrated and dynamic nature of development. More recently, a developmental approach to pathological or atypical populations is leading to exciting advances in our knowledge of normal development as well as abnormal development.

Achenbach examines in detail the potential of the developmental perspective as a framework for organizing research on psychopathology and stimulating integrative theory, as well as for improving our assessment and intervention efforts with children at risk for or already manifesting psychological problems. The implications of this perspective for training in different disciplines are also explored, with Achenbach suggesting core areas of training for professionals who share a common concern about psychopathology whether they are students of nursing, pediatrics, psychiatry, clinical psychology, human development, education, or social work.

1 A historical perspective on the discipline of developmental psychopathology

Dante Cicchetti

One way of measuring the success of a new scientific discipline is to examine its impact on the current literature. The recent increase in the number of books, articles, and journals dealing with developmental psychopathology reflects a growing recognition of the significance of this discipline within the behavioral sciences. For example, several journals, including the *American Journal of Psychiatry, The Journal of Consulting and Clinical Psychology,* and *The Journal of the American Academy of Child and Adolescent Psychiatry,* have published special sections on the topic. Moreover, three journals have devoted one or more special issues to the field of developmental psychopathology – *Child Development* (Cicchetti, 1984b), *The Journal of Child Psychology and Psychiatry* (Stevenson, 1985), and *New Directions for Child Development* (Cicchetti & Beeghly, 1987; Cicchetti & Schneider-Rosen, 1984a; Nannis & Cowan, 1988; Rizley & Cicchetti, 1981; Selman & Yando, 1980; Tronick & Field, 1986). Furthermore, the most recent edition of the *Handbook of Child Psychology* (Mussen, 1983) contained the first chapter on the topic of developmental psychopathology (Rutter & Garmezy, 1983) since the publication of its first edition over 40 years ago. In addition, textbooks, handbooks, and scholarly references are appearing increasingly in the literature (Achenbach, 1974/1982; Cicchetti & Beeghly, 1990; Cicchetti & Carlson, 1989; Gollin, 1984; Lewis & Miller, in press; Rutter, Izard, & Read, 1986; Santostefano, 1978; Trad, 1986, 1987; Wenar, 1982; Zigler & Glick, 1986). Moreover, there is now a journal devoted

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exclusively to the discipline of developmental psychopathology, entitled *Development and Psychopathology.*

Although it has been only during the past two decades that developmental psychopathology has crystallized as a new interdisciplinary science with its own integrity, it nonetheless has historical roots within a variety of areas and disciplines. An exploration of the ways in which the study of psychopathology and the study of development have been intertwined historically is the focus of this chapter. Such an undertaking will yield valuable insights into the contemporary state of the developmental psychopathology discipline, as well as serve as a basis for further direction and guidance of its future.

Organismic theories of development: historical underpinnings

Whereas the concept of development as qualitative change over time was hardly fathomable in 1800, by midcentury it had blossomed into a major viewpoint (Hofstadter, 1955; Nisbet, 1969). In particular, Herbert Spencer's (1862/1900, 1864/1896) "developmental hypothesis" or "doctrine of evolution" had a predominant influence on the social and scientific ideologies of the late nineteenth and early twentieth centuries. Spencer depicted development as a uniform process that was governed by universal laws and principles.

Three major developmental theories predominated within the behavioral sciences before the 1970s. These included the Wernerian organismic developmental theory, the psychoanalytic developmental theory, and the Piagetian structural developmental theory. All of these theories are rooted in an "organismic," rather than a "mechanistic," conceptualization of development (Overton, 1984; Reese & Overton, 1970). An organismic model of development stresses the dynamic role of the individual and depicts the individual as an organized whole. Principles of behavior are seen in terms of the organization among parts and wholes and of the dynamic relationship between the individual and the environment. In contrast, a mechanistic model of development views the individual as a passive, reactive organism. All activity results from forces that act on the individual in predictable ways (Overton, 1976; Santostefano, 1978).

It is interesting to note that every one of these ideas that are central to the organismic model of development can be identified in the very beginnings of Western thought – in the writings of Plato and Aristotle (Kaplan, 1967). The notion of the role of integration of multiple domains of behavior for the harmonious functioning of the individual was anticipated by the Platonic conception of the triune character of the soul. In Plato, one also can find the idea of hierarchically integrated domains of functioning within his conceptualization of the dominance of reason (a higher function) over passion (a lower function). Moreover, in Plato's view of the dynamic role of the individual one discovers another historical root of the organismic perspective.

Likewise, Aristotle was one of the first to argue that individuation, differ-

entiation, and self-actualization were the characteristic aspects of developmental transformations (Kaplan, 1967, 1983). Aristotle also stressed the interdependence between the environment and the individual. A believer in the concept of the multiple determination of behavior, Aristotle argued that different levels of behavioral organization existed in humans. Moreover, one also can find in Aristotle an emphasis on a holistic understanding of behavior – the part must be viewed in relation to the whole in order to understand its true meaning. Although neither Aristotle nor Plato focused on the interrelation between these ideas and the psychopathological condition, nonetheless they built a potent theoretical foundation for the discipline of developmental psychopathology.

The fact that the systematization of the organismic model of development was aided greatly by work within embryology (Cairns, 1983; Sameroff, 1983) underscores an important theme within the developmental psychopathology discipline – namely, the way that advances in our knowledge of development and within particular scientific disciplines can mutually inform each other. The work of embryologists since the nineteenth century has provided a rich empirical foundation for the emergence of organismic theories of development of great significance for understanding human behavior (Spemann, 1938; von Baer, 1828/1837; Waddington, 1957; Weiss, 1969b). From their efforts to learn about normal embryological functioning, early embryologists derived the principles of a dynamically active organism and of a hierarchically integrated system that were later used in investigations of the processes of abnormal development within the neurosciences, embryology, and experimental psychopathology.

For example, a key question for embryologists has been how to understand the way in which somatic cells with similar genetic codes develop toward increasing differentiation in functioning. The discovery by Hans Spemann (1938) that cellular tissues could be successfully transplanted from one functional area to another marked the development of an important contribution to an understanding of the dynamic aspects of the developmental process in general. In his research, Spemann was able to transplant the neural plate of amphibia into an area specialized for limb growth and found that the transplanted tissue took on the characteristics of skin and muscle, rather than the characteristics of neural tissue from which it had originated. From this, Spemann put forth the idea that contextual forces can serve to "organize" cellular development. In this view, biological development was seen as being directed by the interactions among the various elements of a developmental system. The basic elements of such systems depended on the whole system for their meaning, and at the same time their mutual regulation permitted self-regulation.

The work of Kuo (1939) further exemplifies the valuable theoretical contributions of embryologists to developmental psychopathology. For example, in studies of the embryological development of chicks, Kuo (1939) showed the

importance of the developing organism's behavioral feedback on its development, thereby underscoring the significance of acknowledging the dynamic quality of behavior within development. In a later summary of his approach, Kuo (1967, p. 25) wrote the following:

> The study of behavior is a synthetic science. It includes comparative anatomy, comparative embryology, comparative physiology (in the biophysical and biochemical sense), experimental morphology, and the qualitative and quantitative analysis of the dynamic relationships between the organism and the external physical and social environment.

Kuo further states that one of the major goals to accomplish in this venture is to obtain a comprehensive understanding of the behavioral repertoire of the organism and to ascertain the causal factors that occur from stage to stage during ontogenesis. Kuo's aims bear a striking resemblance to the goal of developmental psychopathologists to achieve a multidomain, interdisciplinary study of psychopathological and normal development.

A similar emphasis on a holistic, dynamically functioning entity defined by its environmental interactions is found in the work of later organismic theorists such as Werner (1948) and Piaget (1952). In particular, the significance of the work of the embryologist Paul Weiss (1969b) for the organismic developmental theorist Werner and that of the embryologist C. H. Waddington (1957) for Piaget has been noted previously (Sameroff, 1983). In fact, it is possible to see in the embryological studies the underlying basis for Werner's orthogenetic principle "that wherever development occurs it proceeds from a state of relative globality and lack of differentiation to a state of increasing differentiation, integration, articulation, and hierarchic integration" (1957, p. 26). There is no doubt that the study of embryology proved to be highly significant for the demonstration and the emergence of the developmental principles of differentiation, hierarchical organization, and dynamic environmental transaction (Fishbein, 1976; Nowakowski, 1987).

Moreover, within the beginnings of the discipline of neuroembryology it is possible to find the foundation for the principle of hierarchical integration (Hamburger, 1980). The late 1880s were dominated by the reticular theory that envisioned the nervous system as a syncytial network of nerve fibers that were continuous with each other and in which the cell bodies were seen as trophic elements, as points of intersection. Such a conceptualization of the nervous system prevented delineation of specific pathways and connections, which are the necessary prerequisites of integrated function. The demonstration by the Spanish neurologist Santiago Ramon y Cajal that the nerve fibers have terminal structures that contact with other nerve cells but do not fuse with them – that they are contiguous rather than continuous – provided the empirical basis for a hierarchically integrated nervous system (Cajal, 1893, 1937). Moreover, this demonstration was made possible by Cajal's use of embryos to study the developing nervous system, a method that Cajal (1937,

p. 324) defended in the following terms: "Since the full grown forest turns out to be impenetrable and indefinable, why not revert to the study of the young wood, in the nursery stage, as we might say?"

Cajal's work illustrates the importance of a developmental approach to the understanding of a system, in this case, the nervous system. Moreover, the structural discoveries made possible by such a method can be seen as contributing further to an understanding of the major developmental principle of hierarchical integration. The strong dynamic orientation of Cajal's neuronal theory also made him an important precursor of the organismic perspective.

Although the developmental theories of Freud, Werner, and Piaget all stem from a common organismic tradition, there are many important differences among them, and these have been well chronicled (Baldwin, 1980). Most important for our purposes here, psychoanalytic theory focused largely on the emotions, whereas the structural developmental theories of Piaget and Werner stressed cognition (Cicchetti & Hesse, 1983; Cicchetti & Pogge-Hesse, 1981). In part as a consequence of their relative emphasis, psychoanalytic theory was influential primarily among clinicians in psychology and psychiatry, while the Piagetian and Wernerian organismic developmental theories had a dramatic impact on researchers.

The interrelation between abnormal and normal functioning

The study of pathological populations enabled researchers working within all three developmental traditions to confirm and to expand the developmental principles on which their theories were based. For example, Werner (1948, p. 23) stated: "A whole series of mental diseases are important to developmental psychology in that they represent the regression, the dissolution, of the higher mental processes, or inhibitions of the genetically advanced levels." Furthermore, Werner (1948, pp. 33–4) believed that "psychopathology will shed light on the genetic data of other developmental fields . . . the results of psychopathology . . . become valuable in many ways for the general picture of mental development, just as psychopathology is itself enriched and its methods facilitated by the adoption of the genetic approach."

In their recognition of the importance of the abnormal for confirmation of the normal, these researchers were borrowing from a well-established tradition. Historically, numerous eminent scientists, theoreticians, and clinicians have adopted the premise that studies of normal development and abnormal development can be mutually informative. William James (1902, 1917, 1920) emphasized the significance that an understanding of abnormal mental functioning could have for our understanding of human nature. Goethe viewed psychopathology as resulting from "regressive metamorphoses" and stressed the intimate connection between abnormal and normal functioning. According to Goethe, the study of pathology allowed one to see, magnified, the normal processes of development and functioning. In the ideas of Goethe on

the nature of psychopathology it is possible to find a primary influence on Freud, Werner, and Goldstein (Kaplan, 1967).

The principle of the interrelatedness of abnormal and normal functioning finds perhaps its clearest expression in the work of Sigmund Freud (1927/1955a, 1937/1955b, 1940/1955c, 1940/1955d), who indeed drew no sharp distinction between normal and abnormal functioning. Freud's emphasis on the prime importance of the irrational highlighted the close connection between the normal and the abnormal. As Freud's ideas gradually permeated the substance of psychology proper, his thesis that there was a normality–abnormality continuum met with increasingly wide acceptance.

Furthermore, prominent workers in the biological sciences also have long recognized the interrelations between the normal and abnormal. In *The Expression of the Emotions in Man and the Animals* (1872/1965), Darwin paid much attention to the facial expressions of the insane and the mentally retarded. Through his keen observations, Darwin raised many questions about the nature of the interrelations among cognition, affect, and biology. Many of his assertions were crystallized not only by his knowledge of people who were emotionally and/or cognitively disturbed but also by his work with people from different cultures. Indeed, research in the area of developmental psychopathology is necessary for the same reasons that cross-cultural research is essential. Both kinds of studies can tell us what development sequences are logically necessary and what alternate pathways of development are possible, as well as provide evidence on which factors accounting for normal growth are most important (e.g., biological, genetic/biochemical, socioemotional, cognitive, linguistic/representational).

The importance of studying atypical, pathological, and psychopathological populations for understanding normal development

Working within diverse disciplines, including embryology, the neurosciences, clinical and experimental psychology and psychiatry, researchers have utilized atypical, pathological, and psychopathological populations to elucidate, expand, and affirm further the basic underlying principles of their developmental theories. In the following sections, we provide illustrations of these efforts within a variety of different disciplines.

Embryology

Paul Weiss (1961, 1969a,b), an embryologist whose work greatly influenced Werner, defined development as a hierarchic systems operation and showed quite clearly that the study of pathological embryos could inform us greatly about normal embryogenesis. In an important paper entitled "Deformities as Cues to Understanding Development of Form," Weiss (1961, p. 50)

stated his viewpoint on the interrelation between normality and pathology: "Pathology and developmental biology must be reintegrated so that our understanding of the 'abnormal' will become but an extension of our insight into the 'normal,' while . . . the study of the 'abnormal' will contribute to the deepening of that very insight." The similarities between Weiss's reasoning and that of contemporary developmental psychopathologists are striking. In addition, as Nowakowski (1987) has pointed out, there is considerable variability in neurogenesis. Furthermore, it is conceivable that this variability may be related to the emergence of several developmental psychopathologies, including schizophrenia (Kovelman & Scheibel, 1983) and dyslexia (Kemper, 1984; Sherman, Galaburda, & Geschwind, 1985).

Neurosciences

Although studies of pathological embryogenesis helped to confirm the significance of the principle of hierarchical integration, studies conducted in the neurosciences have provided even stronger evidence in support of the principle of hierarchical integration. In fact, workers within the field of the neurosciences have a long history of demonstrating the importance of pathology to the elucidation of the nature of normal developmental processes and principles.

John Hughlings Jackson's study (1884/1958) of neurological conditions (e.g., epilepsy and hemiplegia) advanced our understanding of developmental processes, in particular regarding the principle of hierarchical integration. By examining the way in which various disease processes interfered with the passage of information between higher nervous centers and consequently decreased the control over lower centers, Jackson (1884/1958) provided firm support for the idea of a nervous system that developed in accordance with the principle of hierarchical integration; see Sulkowski (1983) for a modern-day perspective on the implications for schizophrenia of a Jacksonian approach.

Based on his study of clinical neurological populations, Jackson formulated a conceptualization of development that entailed a change from levels of simplicity and automaticity toward levels characterized by greater complexity, flexibility, and voluntary control. Jackson argued that the more recent phylogenetic centers were more highly evolved than the older centers and that these more recent centers involved the greatest organizational complexity and were most subject to voluntary, rather than automatic, control.

Furthermore, Jackson's work with neurologically diseased patients provided the confirmation of the knowledge of a hierarchically organized model of normal nervous system functioning on which Bronson (1965) could further elaborate (Luria, 1966/1980). Bronson (1965) likewise proposed a hierarchically organized model of the central nervous system and speculated on the implications of such an organization for the ontogenesis of learning processes and critical periods in early development. Subsequently, Bronson (1974) pro-

posed a similar model to account for the postnatal growth of human visual capacity. In both of these depictions, Bronson argued that the phylogenetically older brain structures matured first and were more differentiated at birth than the most recently evolved center and that their functions were subordinated to and inhibited by these new, higher centers during the course of normal ontogenesis. Moreover, a summary of the evidence integrating the data on patterns of myelinization during neural growth (Yakovlev & Lecours, 1967), histological developments within the neocortex (Conel, 1937–67), and the growth of evoked potentials (Desmedt, 1977) strongly suggests that Bronson's ideas are plausible.

In fact, virtually every prominent developmental theorist over the course of the twentieth century has espoused similar beliefs about the importance of hierarchical integration (Baldwin, 1894, 1906; Bruner, 1970; Fischer, 1980; Kaplan, 1966; Piaget, 1971; Spencer, 1862/1900, 1864/1896; Sroufe, 1979a,b; Waddington, 1957; Werner, 1948; White, 1965). For example, Spencer conceived of the developmental process as one of integration of successively higher stages that occurred in an invariant sequence. Spencer likewise considered these stages to be hierarchical while coexisting in time. Because an organism's early structures are not lost in development via hierarchical integration, the organism can maintain feelings of integrity and continuity in the face of change so rapid that it might otherwise cause problems for the sense of internal continuity (Spencer, 1862/1900, 1864/1896), an idea that has been pursued further by current developmental thinkers (Block & Block, 1980; Cicchetti & Schneider-Rosen, 1986; Kagan & Brim, 1980; Sackett, Sameroff, Cairns, & Suomi, 1981; Sroufe, 1979a) and that has figured significantly among developmental psychopathologists (Cicchetti & Schneider-Rosen, 1986; Garmezy, 1974b; Sroufe & Rutter, 1984).

Additional empirical contributions to knowledge of the developmental processes of differentiation and integration may be traced to the discipline of clinical neurology. In the late 1940s, Seyfarth and Denny-Brown (1948) and Denny-Brown, Twitchell, and Saenz-Arroyo (1949), while working with patients with a variety of neurological disorders, identified three discrete types of grasp responses. Twitchell (1951), in his investigations of hemiplegic patients, discovered these exact types of grasp responses and found that they always appeared in the same sequence in the course of complete recovery – from the more primitive undifferentiated response to the more advanced, differentiated response. In later work on motor skill acquisition in human infancy, Twitchell (1970) demonstrated the exact sequence in the voluntary control of grasping in infants that he had found in clinical neurology patients recovering from hemiplegia. Twitchell (1970) later theorized that these three different grasping responses were mediated at different levels of integration of the brain. Specifically, he hypothesized that the simplest motor response was integrated at the level of the brain stem, that the mechanisms of the intermediately complex motor responses were integrated at the subcortical level, and

that the most advanced grasp reaction was integrated at the cortical level. Furthermore, Jolly (1972), in a review of the evolution of motoric grasping from the prosimians through the New and Old World monkeys to humans, found evidence for the same ontogenetic sequence as that noted by Twitchell in his study of neurologically impaired patients.

Moreover, the degenerative processes underlying dementia have provided another example of the importance of pathological processes for elucidating the hierarchically integrated nature of development. For example, when cortical layers of the brain are destroyed by disease during senescence, as in the case of senile dementia, the most primitive fetal and neonatal reflexes reappear (e.g., rooting, sucking, and grasping) (Paulson & Gottlieb, 1968).

Another example of the importance of developmental disturbances for confirming the hierarchically integrated nature of development comes from studies of disturbed fetal development. For example, during fetal development, anoxia or asphyxia will cause the more recently developed secondary reflexes to disappear, bringing about the reappearance of the earlier-developed primary reflexes (Humphrey, 1953). It appears that what occurs in this instance is that the more newly evolutionarily evolved higher motor centers are destroyed first. Consequently, the behavior of the fetus is reduced to an earlier stage of functioning in which only the phylogenetically older motor neurons are functional.

Likewise, the psychobiologists Teitelbaum, Cheng, and Rozin (1969) have demonstrated that we can learn about the functioning of the normal nervous system by observing how it puts itself back together after disturbances. For example, Teitelbaum and colleagues (1969; Teitelbaum, 1971) have demonstrated that the recovery of functions in rats, such as feeding and drinking, following lesions to the areas of the brain that play relevant roles in these activities (i.e., the lateral hypothalamus) display the same ordering as in the development of these functions in normal rats. The results of these studies provide strong empirical evidence in support of the principle of hierarchical integration in development.

Clinical and experimental psychology and psychiatry

Kurt Goldstein (1939, 1940, 1943, 1948) consistently stated that the study of pathological processes was essential to an understanding of normal ontogenesis and personality functioning. He strove to investigate the organism in its *entirety* and to uncover the transformations of the total personality following perturbations in normal functioning. Goldstein eschewed focusing on unitary aspects or domains of behavior in his experiments in the area of psychopathology (e.g., patients with organic brain lesions and schizophrenics). In his words, "the testing of single capacities, no matter how minutely examined, yields more or less piece-meal material of rather peripheral significance . . . to know the change of reaction time, attention span, or retention, etc., in itself