

## Preface

Approximately 2 percent to 3 percent of the population of the United States has been diagnosed with severe neurological disabilities (e.g., mental retardation, cerebral palsy, autism, chronic severe mental illness). A far greater percentage (10 percent to 20 percent) has less severe disabilities (e.g. learning disabilities, disorders of attention, episodic mental illness). These neurologically based afflictions result in enormous human suffering and social cost, placing a significant burden on even the most affluent countries in the world. For more than 100 years scientists in a wide range of disciplines (e.g., sociology, psychology, medicine, developmental biology) have attempted to determine the causes of these disabilities. Many factors have been isolated including genetics, nutrition, pollutants, inadequate caretaking and social factors linked to poverty.

It is the belief of the authors of this book that one set of factors, those that alter the neurological development of the child during the fetal period, has not been given the attention that it deserves. The prenatal period of development is particularly sensitive to disruption because it encompasses a precisely timed period when organ systems are formed and rapid growth of neurological structures occurs. During no other period in the life course is the well-being of the individual so dependent on precisely timed biochemical events. As a result, an adverse prenatal exposure can impart immutable damage because of the sensitivity of the developing central nervous system during the prenatal period.

A growing number of specialists are making important discoveries regarding the types of factors that perturb fetal neurological development. These researchers have, in some cases, documented long-term psychological, behavioral and educational sequelae. However, this research is scattered throughout research literatures of a variety of professions (medicine, epidemiology, developmental psychopathology, reproductive biology), is technically challenging for non-specialists and is not readily available to many that do not have access to research libraries or specialized computerized retrieval mechanisms. Thus, it is the purpose of this book to summarize the most important findings regarding prenatal exposures that have been associated with learning and behavior problems of children and adolescents.

This volume is organized into five sections. The first introduces the main themes of the book and, in a separate chapter, presents an introduction to fetal development. This chapter was designed to set the stage for the understanding of how many

different types of perturbations result in long-term central nervous system damage that has a continued effect as the child matures. The second section is devoted to low birth weight, preterm birth and asphyxia. These are among the most widely researched markers or indicators that prenatal perturbations have occurred. The remaining three sections are devoted to detailed discussions of the research linking maternal illness, maternal drug use and maternal exposure to pollutants to long-term negative effects on child and adolescent development. We are particularly pleased to be able to summarize many recent findings in the area of air, water and household chemical pollutants as this volume is one of the first to include detailed reviews of this burgeoning area of scientific activity.

It is our hope that having this body of knowledge—compiled for the first time in one volume—will aid researchers, practitioners and policy makers in elevating prenatal events to a more central position in the understanding of learning and behavioral pathologies of children and adolescents. A nuanced understanding of the role of prenatal events is particularly important in today's world, as the number of children with developmental anomalies is increasing, largely due to improved medical care. This book stands to fill a cross-disciplinary conceptual gap and serve as an important resource to the psychological, medical and educational community, setting the context for appropriate prevention and intervention activities that have the potential to foster the developmental well-being of children.

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