people of their humanity, he maintained that his approach could actually lead to more humane societies. For example, if people were not responsible for negative behaviors, they should not be punished, for they had no control over their behaviors. Instead, the environment that reinforced the unwanted behaviors should be changed so that desirable behaviors receive reinforcement and increase in frequency.

Sigmund Freud defined determinism in terms of the unconscious and contended that behavior is caused by internal, mental mechanisms. In some ways, Freud was more extreme than Skinner, who acknowledged that some behaviors are not predictable. The main difference between Freud and Skinner involved the origin of causation; Freud believed in underlying physiological processes while Skinner opted to focus on external causes. Thus, even though Freudians and Skinnerians differ on almost every conceivable dimension, they have at least one commonality in their reliance on determinism.

Those scientists who believe that behaviors are determined have recognized the difficulty in making explicit predictions. Thus, they have developed the concept of statistical determinism. This means that, even though behaviors are determined by fixed laws, predictions will never be perfect because so many different factors, most of them unknown, affect actions, which result in generally accurate predictions. The recently developed theory of chaos relates to making predictions about complex events such as behaviors. This theory suggests that in a cause-effect situation, small differences in initial conditions may lead to very different outcomes. This theory supports the notion that behaviors may not be completely predictable even though they may be dictated by fixed natural laws.

Further Reading

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### Developmental delay

Any delay in a child’s physical, cognitive, behavioral, emotional, or social development, due to any number of reasons.

Developmental delay refers to any significant retardation in a child’s physical, cognitive, behavioral, emotional, or social development. The two most frequent reasons for classing a child as having developmental delay involve those psychological systems for which there are good norms. This is especially true for motor development and language development. Because it is known that all children begin to crawl by eight months of age and walk by the middle of the second year, any child who was more than five or six months delayed in attaining those two milestones would probably be classified as developmentally delayed and the parents should consult the pediatrician.

Most children begin to speak their first words before they are eighteen months old and by three years of age the vast majority are speaking short sentences. Therefore, any child who is not speaking words or sentences by the third birthday would be considered developmentally delayed and, as in motor development delay, the parent should consult the pediatrician.

The other developmental problems that children show are more often called disabilities rather than delays. Thus, the small group of children with autism do not show normal social development but these children are usually called disabled or autistic rather than developmentally delayed. Similarly, most children are able to read single words by the second grade of elementary school. Children who cannot do that are normally labeled dyslexic or learning disabled, or in some cases academically delayed, rather than developmentally delayed.

Physical development is assessed by progress in both fine and gross motor skills. Possible problems are indicated by muscles that are either too limp or too tight. Jerky or uncertain movements are another cause for concern, as are abnormalities in reflexes. Delays in motor development may indicate the presence of a neurological condition such as mild cerebral palsy or Tourette’s syndrome. Neurological problems may also be present when a child’s head circumference is increasing either too fast or too slowly. Although physical and cognitive delays may occur together, one is not necessarily a sign of the other.

Important cognitive attainments that physicians look for in infants in the first 18 months include object permanence, an awareness of causality, and different reactions to strangers and family members. Cognitive delays can signal a wide variety of problems, including fetal alcohol syndrome and brain dysfunction. Developmental milestones achieved and then lost should also be investigated, as the loss of function could be sign of a degenerative neurological condition.

Delays in social and emotional development can be among the most difficult for parents, who feel rejected by a child’s failure to respond to them on an emotional level. They expect such responses to social cues as smiling, vocalization, and cuddling, and may feel angry or frustrated when their children do not respond. However, a delay in social responses can be caused by a number of factors, including prenatal stress or deprivation, prematurity, birth difficulties, including oxygen deprivation, or a hypo-

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sensitivity of the nervous system (which creates an aversion to stimuli that are normally tolerated or welcomed).

Many physicians routinely include developmental screening in physical examinations. Parents concerned about any aspect of their child’s development are generally advised to seek the opinion of a pediatrician or appropriate specialist. Specific assessment instruments such as the Gesell Development Scales and the Bayley Scales of Infant Development are used to help determine whether an infant is developing at a rate appropriate to the child’s age.

Further Reading

## Developmental reading disorder

A condition in which reading ability is significantly below the norm in relation to chronological age and overall intellectual potential.

Also referred to as reading disability, reading difficulty, and dyslexia, developmental reading disorder is the most commonly diagnosed learning disability in the United States. Estimates of its prevalence vary widely, ranging from 4% of children—the figure given by the American Psychiatric Association’s *Diagnostic and Statistical Manual*—to 20%, the figure given by a 1995 study directed by Sally E. Shaywitz of Yale University. According to the latter figure, some 10 million children in the United States have some form of reading disability.

Reading disabilities are diagnosed up to five times more frequently in boys than girls, although some sources claim that this figure is misleading because boys are more likely to be screened for learning disabilities due to their higher incidence of disruptive behavior, which draws the attention of educators and other professionals. Most reading disabilities were formerly grouped together under the term dyslexia, which has largely fallen out of favor with educators and psychologists because of confusion over widespread and inconsistent use of the term in both broad and narrower contexts. Developmental reading disorder is distinct from alexia, which is the term for reading difficulties caused by brain damage from injury or disease. However, neurological studies of alexia have helped researchers better understand reading disabilities.

## Types of and causes of reading disorders

Reading disabilities have been classified as either dyseidetic, dysphonetic, or mixed. Children with the dyseidetic type are able to sound out individual letters phonetically but have trouble identifying patterns of letters when they are grouped together. By comparison, dysphonetic readers have difficulty relating letters to sounds, so their spelling is totally chaotic. Children with mixed reading disabilities have both the dyseidetic and dysphonetic types of reading disorder.

A variety of causes have been advanced for developmental reading disorder. Researchers favoring a biological explanation have cited heredity, minimal brain dysfunction, delays in neurological development, and failure of the right and left hemispheres to function properly together.

Developmental reading disorder is often identified in the first grade, when reading instruction begins. Children with reading disabilities lag behind their peers in reading progress and have serious spelling problems. They also tend to have trouble writing (many have poor handwriting), have an unusually small vocabulary, and favor activities that do not require verbal skills. Also, like children with other learning disabilities, those with developmental reading disorder often earn poor grades and dislike school, reading, and homework. Even at the preschool stage, there are certain problems, such as trouble sounding out words and difficulty understanding words or concepts, which may foreshadow a reading disability.

The outcome of treatment for reading disabilities varies, depending on the quality of the remedial reading program, the severity of the disorder, and the motivation and intelligence of the child. Given the proper remedial help, some children with reading disabilities have been able to successfully complete high school, college, and even graduate school, while others have been forced to limit their vocational choices to fields that do not demand strong literacy skills. Factors that have been found to contribute to the success of treatment include early intervention (elementary rather than secondary school); an IQ over 90; instruction by qualified reading specialists; and a total of over 50 hours of instruction.

Further Reading