INTRODUCTION

Research on the antecedents of aggression and violence has increased considerably in recent years, as parents, researchers, and policy makers endeavor to understand this phenomenon. Many theories have been proposed (e.g., Pincus, 2001) and numerous intervention strategies have been tried (see Elliott & Tolan 1999), with varying degrees of success. Many factors contribute to the development of aggressive behavior, and although research offers some general predictors, there remains a large degree of uncertainty that at present can not be captured by a single theory. In this chapter, we explore the role of impaired or altered cognition in the genesis of aggressive behavior: what neuropsychological deficits are observed in aggressive individuals, what might be contributing to or causing these deficits, and how do these limitations influence behavior? Special emphasis is given to the frontal lobes and executive functioning, as well as putative brain disease and a number of environmental factors that contribute directly and indirectly to aggression. While impaired cognition may not account for all the variance, it seems to represent an important piece of the aggression puzzle. Specifically, it is hypothesized that cognitive deficits, especially impulsivity, poor planning ability, mental inflexibility, low verbal intelligence, and impaired attention, limit an individual's ability to cope with other
biological and environmental vulnerabilities; these limitations, in turn, lead to feelings of frustration and anxiety and ultimately, to difficulty with regulation of emotion and increased aggressive behavior. Some consideration will be given, as well, to the notion of resilience and other factors that might protect an at-risk individual from developing behavior problems, such as aggression.

Aggressive individuals have a multitude of cognitive deficits, which are mostly attributed to damaged frontal lobes and impaired executive functioning, including impulsivity, poor planning ability, working memory deficits, and low verbal intelligence (see Filley et al., 2001; Séguin, Pihl, Harden, Tremblay, & Boulerice, 1995). Although aggression is not necessarily seen in patients with attention deficit hyperactivity disorder (ADHD), aggressive behavior is more common in children who have both ADHD and conduct disorder (Pliszka, 1998). Considerable attention has been given to the influence of putative brain disease, including epilepsy, schizophrenia, and alcoholism. Although some researchers have speculated about a higher incidence of aggression in epileptic patients, this does not appear to be true (Steinert & Froscher, 1994). Similarly, although many people believe that schizophrenic patients are violent, evidence suggests that this is true only when other factors are present, such as substance abuse and medication noncompliance (Spearing, 1999). A higher incidence of aggressive behavior is observed in offspring who were exposed prenatally to alcohol (Olson et al., 1997) and there is a link between violent criminal behavior and substance use (Department of Justice, 1996). There are also a number of environmental factors that have been linked to aggressive behavior, including having a rejecting mother and a criminal parent (Raine, Brennan, Mednick & Mednick, 1996), low socioeconomic status (Gartner & Whitaker-Azmitia, 1996), a history of physical and sexual abuse (Shields & Cicchetti, 1998), inadequate nutrition (Kleinman et al., 1998), and exposure to environmental neurotoxins, such as lead (Needleman, Riess, Tobin, Biesecker, & Greenhouse, 1996). Finally, additional variables that appear to affect aggression, which will only be discussed briefly, include neurobiological factors (e.g., Adamec, 1991) and genetic contributions (e.g., Alsobrook & Pauls, 2000). Aggressive behavior involves a combination of factors, including cognitive deficits which may limit an individual's ability to manage other biological and environmental vulnerabilities.