The purpose of this study was to test Nelles and Barlow's (1988) hypothesis that spontaneous panic attacks are rare or nonexistent prior to adolescence as children lack the ability to make the internal, catastrophic attributions (i.e., thoughts of losing control, going crazy, or dying) characteristic of panic according to the cognitive model (Clark, 1986). Conceptions of panic attacks, including the understanding of symptoms and causes, and cognitive interpretations of the somatic symptoms of panic were examined in children from Grades 3, 6, and 9. A significant main effect for grade was found for conceptions of panic attacks, with third graders receiving significantly lower scores than sixth and ninth graders. However, the majority of all children, regardless of age, tended to employ internal (e.g., "I'd think I was scared or nervous") rather than external (e.g., "I'd think I was feeling that way because of the temperature or the weather") explanations of panic attacks. No significant grade differences were found for the tendency to make internal versus external and catastrophic versus noncatastrophic attributions in response to the somatic symptoms of panic. When presented with panic imagery in a panic induction phase, children, regardless of age, made more internal and noncatastrophic attributions. Finally, internal attributional style in response to negative outcomes and anxiety sensitivity were found to be significant predictors of internal, catastrophic attributions. The challenge that these findings pose to Nelles and Barlow's hypothesis, and their relevance for understanding children's cognitive interpretations of panic symptomatology are discussed.

KEY WORDS: Panic attacks; panic disorder; panic symptoms; children; development; cognition.

Panic disorder is a common adult disorder, the primary feature of which is recurrent and unexpected panic attacks. A panic attack is defined as "a discrete period of intense fear or discomfort that is accompanied by at least 4 of 13 somatic or cognitive symptoms" (American Psychiatric Association, 1994, p. 394). The somatic symptoms described in the Diagnostic and Statistical Manual of Mental Disorders (4th ed.) (DSM-IV; APA, 1994) include shortness of breath, dizziness, and accelerated heart rate, among others, while the cognitive symptoms consist of fear of dying and fear of going crazy or losing control. Based on this distinction between somatic and cognitive symptoms, Clark (1986) put forth a cognitive model of panic in which panic attacks were described as resulting from the "catastrophic misinterpretation" of bodily sensations. Such catastrophic misinterpretation involves the perception of these sensations as far more dangerous than they actually are. For instance, palpitations may be interpreted as a sign of an impending heart attack, slight breathlessness may be perceived as evidence of cessation of breathing and resulting death, or shakiness may be interpreted as signaling loss of control and insanity (Clark, 1986, p. 462). Clark proposed that such catastrophic misinterpretation plays a critical role in the vicious cycle which culminates in a panic attack.
and panic disorder. Although some theorists have questioned the evidence for Clark’s cognitive model, and competing theories exist (McNally, 1990), the cognitive approach to understanding panic attacks has been embraced by several researchers studying the genesis, course, and correlates of panic (cf. Barlow, 1988; Rapee, Mattick, & Murrell, 1986).

While the occurrence of panic attacks and panic disorder is well established in adults (Anderson, Noyes, & Crowe, 1984; Black & Robbins, 1990; Cox, Endler, & Swinson, 1991), controversy exists regarding whether these phenomena occur in children and adolescents. In a recent review, Ollendick, Mattis, and King (1994) concluded that panic attacks are common in adolescents and that panic disorder occurs not infrequently in this population. Among adolescent community samples, for example, 35.9% to 63.3% report panic attacks (King, Gullone, Tonge, & Ollendick, 1993; King, Ollendick, Mattis, & Yang, in press; Macaulay & Kleinknecht, 1989), and 0.6% to 4.7% report past or present symptoms sufficient to meet DSM criteria for panic disorder (Warren & Zgourides, 1988; Whitaker et al., 1990). Moreover, Last and Strauss (1989) reported that approximately 10% of adolescents referred to an outpatient anxiety disorders clinic met diagnostic criteria for panic disorder, whereas Alessi, Robbins, and Dilsaver (1987) reported that 15% of hospitalized adolescents received such a diagnosis. While such data support the conclusion that panic attacks and panic disorder are phenomena which occur in adolescence, Kearney and Silverman (1992) cited several methodological problems in studies of adolescent panic, including small sample sizes and limitations with assessment strategies, and suggested caution in interpreting the prevalence of panic in this population. Furthermore, additional investigation seems critical in determining the extent to which DSM-IV criteria appropriately capture the manifestation of panic in adolescence.

The occurrence of panic attacks and panic disorder prior to adolescence is even less well established. Although several clinical studies and case reports have identified panic in children (Alessi & Magen, 1988; Ballenger, Carek, Steele, & Cornish-McTighe, 1989; Biederman, 1987; Garland & Smith, 1991; Herskowitz, 1986; Last & Strauss, 1989; Moreau, Weissman, & Warner, 1989; Van Winter & Stickler, 1984; Vitiello, Behar, Wolfson, & McLeer, 1990) and have documented the occurrence of catastrophic cognitions in response to bodily sensations (i.e., fears of dying, going crazy, or losing control) among preadolescents, none of these studies has explored the impact of cognitive development on children’s interpretation of somatic symptoms of panic.

Citing the cognitive model of panic (Clark, 1986), Nelles and Barlow (1988) have argued that spontaneous panic attacks are rare or nonexistent in children. They hypothesized that children lack the ability for “catastrophic misinterpretation” of the somatic symptoms associated with panic and that children’s cognitive reactions are dominated by notions of external causation. Indeed, Nelles and Barlow proposed that it is not until adolescence that children are able to make the internal, catastrophic attributions which characterize spontaneous panic attacks (e.g., thoughts of losing control, going crazy, or dying).

The view presented by Nelles and Barlow (1988) is based on the work of Bibace and Walsh (1977, 1979, 1980, 1981) who defined a developmental progression of children’s cognitive interpretations of illness. Specifically, they proposed that prelogical explanations of illness define cause-effect relationships in terms of spatial and/or temporal cues immediately present in the external environment. “Phenomenism,” the least sophisticated explanation of illness, identifies the cause of disease as an external concrete stimulus that may cooccur with the illness but is spatially and/or temporally removed. Explanations classified as “contagion” attribute the cause of disease to phenomena present in the immediate environment but with which the child has no physical contact. Proximity and magical thinking serve to explain the relationship between the cause and the illness.

According to Bibace and Walsh (1981), the Piagetian stage of concrete logical reasoning (approximately 7 to 10 years of age) facilitates differentiation between what is internal to the self versus that which is external. “Contamination” reflects the view that illness is caused by an external stimulus which contaminates the body through physical contact. “Internalization” defines a process (e.g., swallowing or inhaling) whereby an external stimulus enters and infects the body. The final category of formal logical explanations, according to Bibace and Walsh, reflects the greatest degree of differentiation between the internal world and the external environment. “Physiological” explanations describe the source of illness as manifested within internal physiological structures, although external events may serve to trigger malfunctioning. The most sophisticated explanations of illness, classified as “psychophysiological,” also iden-