An Experimental Examination of Learned Helplessness in Older Adolescents and Young Adults with Long-standing Asthma

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Objective: To examine the effects of experimentally induced learned helplessness in older adolescents and young adults with long-standing asthma.

Methods: Thirty-nine participants (18–24 years of age) with histories of long-standing asthma (AS) and an age-matched healthy cohort (HC) (N = 94) received either contingent or noncontingent feedback on an experimental task. Participants’ anagram-solving performance was assessed following the experimental procedure. Participants also completed a measure of depression and pretest-posttest measures of mood, expectancy, and attributions related to experimental task performance.

Results: The AS participants demonstrated significantly greater problem-solving deficits following response-noncontingent feedback, compared to the HC group. Further, whereas both AS and HC participants made more internal performance attributions when given response-contingent feedback, only AS participants demonstrated a pattern of increased internal attributions (i.e., self-focus) following response-noncontingent failure. In addition, 21% of AS participants met DSM-IV criteria for major depression, compared to only 5% of the HC group.

Conclusions: Individuals with long-standing asthma may be at increased risk for depression and for learned helplessness deficits, specifically impaired problem solving, in response to environmental noncontingency. Results are discussed in terms of both learned helplessness theory and perseverative self-focus conceptualizations of depression. The implications for both short- and long-term management of pediatric asthma are also discussed.

Key words: asthma; learned helplessness.

Improved medical management and greater uniformity in asthma treatment has not led to anticipated decreases in the morbidity or mortality of childhood asthma. In fact, recent years have witnessed dramatic increases in both asthma severity and childhood deaths due to asthma (Creer & Bender, 1993). These numbers are perplexing to investiga-
tors, because asthma is regarded by many as largely a controllable and reversible condition (Buist & Volmer, 1990). Thus, despite advances in medical treatments, asthma continues to be an extremely challenging and potentially life-threatening pediatric illness (Weitzman, Gortmaker, Sobol, & Perrin, 1992).

Much of the psychological and behavioral research on asthma has focused on both the development and refinement of self-management treatment approaches for childhood asthma (Lehrer, Sargunaraj, & Hochron, 1992) and on issues of emotional adjustment, particularly as they relate to asthma management, mortality, and morbidity (e.g., Bennett, 1994; MacLean, Perrin, Gortmaker, & Pierre, 1992; Miller, 1987). Indeed, the role of psychological and behavioral issues in asthma management is well documented in the pediatric literature. However, relatively little is known about long-term adjustment and management difficulties, despite the fact that asthma continues to present significant academic, medical, and psychosocial adjustment problems into later adolescence and adulthood (Jolicoeur, Boyer, Reeder, & Turner, 1994).

A primary difficulty faced by researchers in establishing a comprehensive picture of the immediate and long-term challenges posed by asthma is the complex nature of the disease (Creer, 1994; Creer & Bender, 1995). Indeed, the hallmark feature of asthma is its extreme variability, characterized by an intermittent, unpredictable, and reversible disease course. To complicate matters further, the clinical presentation of asthma is widely variable both across patients and within the same patient over time. Not surprisingly, these unique disease features of asthma have become the focus of conceptual models of self-management. Creer and Bender (1993, 1995) suggest that the intermittent and variable nature of asthma is an important ingredient in the development of negative disease expectations and subsequent disease management difficulties.

Recent empirical evidence provides support for examining the specific cognitive and affective sequelae of the unpredictable course of asthma. Mullins, Chaney, Pace, and Hartman (1997) recently found that the combined effect of greater illness uncertainty and perceived helplessness was associated with emotional adjustment problems in individuals with long-standing asthma. These authors speculated that the intermittent and unpredictable nature of asthma may precipitate the emergence of ambiguous disease management-outcome contingencies and negative disease outcome expectancies, which combine to produce an increased vulnerability to the experience of helplessness and problems with adjustment.

Similar studies across a number of pediatric chronic illnesses have noted the role of learned helplessness in emotional adjustment and disease management. Kuttner, Delameter, and Santiago (1990) found that perceived helplessness was associated with both depression and poor metabolic control in children with diabetes. Similar helplessness-depression and helplessness-anxiety relationships have been reported for children with diabetes, sickle cell disease, and cancer (Frank, Blount, & Brown, 1997; Schoenherr, Brown, Baldwin, & Kaslow, 1992). Although these studies were limited by the exclusive use of self-report measures and correlational data, collectively they suggest the need to examine more closely the construct of learned helplessness in pediatric chronic illness.

This study was designed to extend our previous findings demonstrating the role of learned helplessness in older adolescents and young adults with long-standing asthma (AS) (e.g., Mullins et al., 1997). Utilizing experimental analog conditions to simulate behavior-outcome noncontingency, we examined whether individuals with AS (compared to an age-matched healthy cohort [HC]) would demonstrate an increased vulnerability to experimentally induced cognitive deficits following exposure to response-noncontingent feedback on a problem-solving task. The rationale for our investigation was based on two related assumptions: (1) asthma represents an illness in which salient behavior-outcome contingencies (e.g., stimulus-episode, intervention-improvement) are often ambiguous and stimulus control is not always attainable (e.g., Creer & Bender, 1993; Creer & Kotses, 1990; Reed & Townley, 1983); and (2) repeated exposure to this type of noncontingency has been shown to result in increased susceptibility to learned helplessness deficits (including cognitive deficits) when individuals encounter subsequent behavior-outcome noncontingency in the environment (e.g., Kofka & Sedek, 1989; Peterson, Maier, & Seligman, 1993). Thus, we anticipated that persons with AS would be more vulnerable to experimentally induced learned helplessness, specifically cognitive deficits, as a function of chronic exposure to the ambiguous environmental contingencies associated with their disease.

We focused on cognitive performance deficits
as the primary index of learned helplessness in this study for two reasons. First, effective self-management treatment protocols for asthma are predicated on the acquisition and utilization of appropriate problem-solving strategies and, second, because faulty decision making is considered a key factor contributing to poorer asthma management (Creer, Kotses, & Reynolds, 1992; Heerman & Wills, 1992). The experimental demonstration of an increased susceptibility to problem-solving deficits in response to analogous illness conditions could have important implications for understanding asthma self-management difficulties.

**Method**

**Participants**

Two groups of participants, matched for age and socioeconomic status (SES), were recruited from undergraduate classes at three state universities in the southwestern United States. Participants were informed that the purpose of the study was to examine life events and problem solving in persons with and without chronic illnesses. Standardized recruitment and research procedures were conducted in accordance with the institutional review boards of the respective universities and all students received extra course credit for their participation.

The first group of participants (AS) consisted of 39 (22 female; 17 male) older adolescents and young adults with histories of childhood asthma. In an attempt to increase homogeneity, individuals were included in the AS group only if they: (1) had experienced their first asthma episode or had been diagnosed with asthma prior to the age of 12; and (2) were presently receiving medical treatment for their asthma. The AS group subjects ranged in age from 18 to 24 years ($M = 19.5$, $SD = 1.47$), were predominantly Caucasian (94%, $n = 39$) and were from middle to upper-middle SES classes ($M = 2.4$, Class II) (Hollingshead, 1957). Average age at onset of asthma was 6.75 years (range = 3 to 11 years). The AS subjects recruited from study sites one (n = 18), two (n = 15), and three (n = 6) did not differ significantly in terms of age, $F(2, 36) = .08, p = .92$, or socioeconomic status, $F(2, 36) = .40, p = .67$. Individuals were excluded from the AS group if they had multiple chronic illness diagnoses.

The HC cohort was composed of 94 (67 female; 27 male) older adolescents and young adults without histories of childhood chronic illness. Participants were included in the HC group if they (1) reported no history of a chronic illness diagnosis, (2) had never been treated by a physician for a medical condition for more than three consecutive months in any given year, and (3) had never been hospitalized continuously for a medical condition for more than one month (e.g., Hobbs, Perrin, & Ireys, 1985). The HC participants ranged in age from 18 to 24 years ($M = 19.5$, $SD = 1.40$); they were predominantly Caucasian (94%, $n = 88$) and were from middle to upper-middle class backgrounds ($M = 2.10$; Class II) (Hollingshead, 1957). All HC participants were recruited from study site one. The HC and AS groups were comparable across age, $F(1, 131) = .12, p > .05$, and socioeconomic, $F(1, 131) = 2.16, p > .05$, parameters.

**Procedure**

One week following recruitment, participants were administered demographic and depression questionnaires in a group format. Within two weeks of the group testing, participants individually performed the experimental component of the study. Prior to their arrival for the individual session, participants were randomly assigned to one of two treatment conditions (i.e., response-contingent or response-noncontingent feedback) on a computerized concept-formation task; the experimenter remained uninformed of condition assignment. The individual assessment procedure involved five phases: (1) Pretreatment Phase: participants completed mood state, performance expectancy, and task attribution measures; (2) Treatment Phase: participants were administered a computerized concept-formation task on which they received either response-contingent or response-noncontingent performance feedback; (3) Posttreatment Phase: participants again completed mood, expectancy, and task attribution measures; (4) Performance Phase: participants performed a computerized anagram-solving task; and (5) Debriefing Phase: participants in both conditions were informed of the experimental manipulation following the experimental session. Total time for each individual session was approximately 50 minutes.

**Instruments**

*Inventory to Diagnose Depression (IDD)*. The IDD (Zimmerman & Coryell, 1987) is a self-report instru-
ment used to assess symptoms of major depressive disorder. Although originally based on earlier DSM diagnostic schemes, the version used in this study is consistent with current DSM-IV major depression criteria (APA, 1994). Each of the 18 diagnostic items on the IDD is a group of five statements, arranged in order of increasing severity, that assess the severity of a single major depression symptom. Similar to other self-report measures of depression, a severity index of depressive symptomatology can be obtained by summing the items. A scoring algorithm also provides for making binary decisions regarding the presence of symptoms necessary for a diagnosis of major depressive disorder. The IDD has been shown to be a reliable and valid measure of depression and has demonstrated good diagnostic concordance with both semi-structured interviews and clinician ratings of major depression (Zimmerman & Coryell, 1994; Zimmerman, Coryell, Wilson, & Corenthal, 1986). Internal consistency (Cronbach, 1951) for the IDD in the present sample was .89.

**Multiple Affect Adjective Checklist (MAACL).** The MAACL (Zuckerman & Lubin, 1965) is a 132-item checklist that assesses transient mood states. The MAACL contains words describing three different mood states: anxiety (e.g., afraid), depression (e.g., wilted), and hostility (e.g., angry). Respondents are given the instructions: “Please check the words that you feel apply to you right now, at this moment.” Mood adjectives items are scored as 1 (present) or 0 (absent); some items contain positive mood adjectives, which are scored if not endorsed. Items are summed and divided by the number of available words for each mood state. These scores represented the respondents’ level of transient anxiety, depression, and hostility. Scores on the three MAACL mood states were used to examine the effects of the experimental manipulation. Previous studies have indicated that internal attributions tend to increase following response-contingent success on experimental tasks; decreases are seen in response to failure or response-noncontingent aversive experimental conditions (e.g., Cohen, Dowling, Bishop, & Maney, 1985).

**Experimental Task.** Our experimental manipulation procedure was a computerized version of a standard concept-formation task (e.g., Levine, 1971), similar to the task originally used by Hiroto and Seligman (1975) and others (e.g., Benson & Kennelly, 1976). Participants were seated at a computer terminal in a private room and were given the following standardized instructions:

In this experiment, you will be presented with several problems. Each problem consists of a series of displays like the one in the bottom right-hand corner of the screen. Each display has two patterns: one on top and one on bottom. Each pattern contains a letter A and a letter T. You will also notice that one letter is surrounded by a square and the other by a circle, and that one background is red and the other blue. Every display will be like this one except that the letters, the surrounding shapes, and the background colors will be combined in different ways.

One of the two patterns, either the top one or the bottom one, has been chosen to be correct. For each display I want you to indicate
which of these two [top or bottom] you think is correct and I’ll tell you whether you are right or wrong. Then, go on to the next display. Again, you make a choice, and again I’ll tell you whether you are right or wrong.

In this way you can learn the reason for my saying ‘right’ or ‘wrong’. The reason may be because of the position of the letter, the surrounding shape, or the background color. The object for you is to figure the pattern out as fast as possible so that you can choose correctly as often as possible. Press the keyboard letter T if you think the top pattern is correct, or press the keyboard letter B if you think the bottom pattern is correct.

Participants were given examples of how the task was to be performed. Then participants were presented with a series of 40 stimulus patterns on the computer screen; the patterns were grouped into four sets of problems, with 10 trials for each problem. At the end of each tenth trial, the stimulus dimension (e.g., the letter A) associated with a correct response changed automatically, requiring participants to determine the new correct stimulus dimension (e.g., the color blue).

As part of the standardized instructions, all participants were given the perception that the task was solvable and that determining the correct dimension (i.e., letter, color, shape) of the stimulus pattern was attainable. However, only approximately half the participants in both groups (n = 69) received solvable problems with response-contingent correct and incorrect feedback on their performance. In other words, participants in this experimental condition were given feedback that allowed them to eventually discover the correct stimulus pattern. Participants in the response-noncontingent treatment condition (n = 64) received unsolvable problems with response-noncontingent correct and incorrect feedback on their performance. Participants in this condition were unable to determine the correct stimulus pattern due to random performance feedback and, subsequently, could not correctly identify any of the patterns across the four blocks of 10 trials.

Anagram Performance. The computerized anagram-solving task used here contained 20 anagrams, consisting of five letters each. All anagrams were presented in the same scrambled order (i.e., 3–4–2–5–1) and were solvable using a 5–3–1–2–4 solution sequence (e.g., Alloy, Peterson, Abramson, & Seligman, 1984; Benson & Kennelly, 1976; Hiroto & Seligman, 1975). Participants were given the following standardized instructions to complete the anagram task:

You will be asked to solve some anagrams. Anagrams are words with the letters scrambled. The problem for you is to unscramble the letters so that they form a word. When you have found the word, type it onto the computer keyboard. Notice that there may be a pattern or principle by which to solve the anagrams. But that's up to you to figure out.

You will have 100 seconds to solve each anagram before the next one is presented. If you guess incorrectly, you may try again and again until the time limit is up. If you want to make a correction, use the backspace key.

Participants were then presented with 20 anagrams on the computer screen; they were given 100 seconds in which to solve each anagram. The primary outcome measure in the present study was the number of anagrams incorrectly identified (i.e., not solved in <100 seconds) out of the 20 trials on the anagram-solving task (e.g., Alloy et al., 1984).

Results

Manipulation Checks

We performed a series of preliminary analyses to evaluate the effectiveness of random assignment to response-contingent or response-noncontingent treatment conditions and to examine the effects of the experimental manipulation on MAACL mood states, VAS performance expectancy ratings, and ATTRIB task attributions (see Table I for descriptive statistics). An initial 2 × 2 (Group × Condition) MANOVA revealed no significant group [F(5, 125) = 1.57, p > .05], condition [F(5, 125) = .76, p > .05], or group × condition [F(5, 125) = 1.84, p > .05] effects on pretreatment levels of MAACL depression, anxiety, and hostility, VAS performance expectancy ratings, or ATTRIB task attributions.

A 2 × 2 × 2 (Group × Condition × Time) repeated measures MANOVA revealed a significant group × condition × time effect, F(7, 123) = 3.49, p < .01. Univariate tests indicated that only ATTRIB scores varied significantly by group, condition, and time, F(1, 129) = 9.27, p < .01. For both AS and HC participants in the response-contingent task condi-
Table I. Descriptive Statistics for IDD Depression by Group: MAACL Mood States, VAS Performance Expectancy Ratings, and Task Attributions by Group and Experimental Condition

<table>
<thead>
<tr>
<th>Measures</th>
<th>Asthma: Experimental Condition</th>
<th>Healthy: Experimental Condition</th>
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<tbody>
<tr>
<td></td>
<td>Contingent Pre M</td>
<td>Post M</td>
</tr>
<tr>
<td>MAACL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression</td>
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<td>.71</td>
</tr>
<tr>
<td>Anxiety</td>
<td>1.23</td>
<td>.67</td>
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<tr>
<td>Hostility</td>
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<td>.52</td>
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<tr>
<td>VAS</td>
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<tr>
<td>Expectancy</td>
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<td>6.24</td>
</tr>
<tr>
<td>ATTRIB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal</td>
<td>4.82</td>
<td>5.45</td>
</tr>
</tbody>
</table>

IDD = Inventory to Diagnose Depression; MDD = DSM-IV Major Depressive Disorder; MAACL = Multiple Affect Adjective Checklist; VAS = Visual Analog Scale; ATTRIB = Task Attributions.

aIn the asthma group (n = 39), IDD depression M = 15.2, SD = 8.6, and MDD = 21%; in the healthy group (n = 94), IDD depression M = 13.1, SD = 9.7, and MDD = 5%.

Although IDD depression severity did not differ between AS and HC participants (t(132) = 1.47, p > .05], a significantly greater proportion of the AS group (21%) met DSM-IV diagnostic criteria for current major depression, compared to only 5% in the HC group, χ²(1) = 7.22, p < .01. Because AS and HC groups differed significantly in rates of DSM-IV major depression, depression diagnosis was utilized as a covariate in a 2 × 2 (group × condition) ANCOVA to assess differences in anagram performance. Results of the initial regression step of the ANCOVA revealed that depression diagnosis had a significant effect on anagram performance, F(1, 128) = 4.72, p < .05.

Results also revealed a significant main effect for condition (i.e., contingent versus noncontingent feedback) on anagram performance, F(1, 128) = 3.90, p < .05. This main effect was qualified by a significant group × condition effect, F(1, 128) = 4.11, p < .04. Post-hoc analyses revealed that AS and HC participants in the response-contingent feedback condition did not differ significantly in the number of anagram errors committed (Ms = 2.0 and 2.5, respectively). However, AS participants receiving noncontingent feedback (M = 7.0) made significantly more anagram errors than their healthy counterparts (M = 4.3) in the same condition (p < .05). Thus, individuals in the AS group performed more poorly following noncontingent
measured by cognitive performance deficits, in a group of older adolescents and young adults with long-standing asthma compared to an age-matched healthy cohort. The experimental procedure was generally effective in inducing transient moods and in modifying performance expectancies and attributions in both AS and HC participants. Also, both AS and HC participants performed more poorly on an anagram-solving exercise following response-noncontingent feedback on the experimental task compared to participants exposed to response-contingent experimental conditions. Thus, the validity of the experimental manipulation was supported by our findings.

Results of the primary analyses revealed that AS participants who received noncontingent task feedback committed significantly more anagram errors than both AS and HC participants in the response-contingent feedback condition and significantly more errors than their HC counterparts also receiving noncontingent feedback. The experimental manipulation also produced greater treatment effects (contingent vs. noncontingent feedback) within the AS group. Results indicated that, whereas the experimental induction produced anagram performance differences for participants in both AS and HC groups, the significant group × condition interaction effect on anagram performance was a function of the poorer performance (i.e., significantly more errors) by AS participants following exposure to response-noncontingent experimental task conditions. It is also noteworthy that the observed cognitive deficits could not be accounted for solely by the significant effect of depression on anagram performance, even though 21% of AS participants met DSM-IV criteria for a current major depressive episode (compared to only 5% of the HC group).

One explanation of our findings incorporates the unpredictable and variable nature of asthma to describe the demonstrated increased vulnerability of AS participants to experimentally induced learned helplessness. To illustrate, learned helplessness theory would suggest that repeated exposure to aversive behavior-outcome noncontingency decreases problem solving, hinders recognition of subsequent contingencies in the environment, and increases the likelihood that future encounters with uncontrollable stimuli will result in the types of cognitive and affective responses observed here (e.g., Hiroto & Seligman, 1975). Although we did not examine perceptions of disease controllability directly in this investigation, numerous studies

**Figure 1** Anagram performance by group (asthma vs. healthy) and condition (response-contingent vs. response-noncontingent feedback).

Because of the unusual pattern of increased ATTRIB scores observed for AS participants following noncontingent feedback, zero-order correlations were performed to determine whether higher internal task attributions were associated with anagram performance within each group × condition combination. Results revealed that greater ATTRIB scores were associated with more anagram errors for AS participants in the noncontingent feedback condition, r(18) = .45, p < .05, and fewer anagram errors for HC participants in the contingent feedback condition, r(48) = -.31, p < .05. Task attributions were unrelated to anagram performance for AS individuals receiving contingent feedback and for HC participants receiving noncontingent feedback (ps > .05).

**Discussion**

This study was designed to examine the effects of experimentally induced learned helplessness, as measured by cognitive performance deficits, in a group of older adolescents and young adults with long-standing asthma compared to an age-matched healthy cohort. The experimental procedure was generally effective in inducing transient moods and in modifying performance expectancies and attributions in both AS and HC participants. Also, both AS and HC participants performed more poorly on an anagram-solving exercise following response-noncontingent feedback on the experimental task compared to participants exposed to response-contingent experimental conditions. Thus, the validity of the experimental manipulation was supported by our findings.

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have demonstrated that prior exposure to non-contingency or uncontrollability is the single most influential variable in determining subsequent vulnerability to learned helplessness deficits (e.g., Peterson et al., 1993; see also Kohta & Sedek, 1989). Moreover, previous studies have found that increased asthma uncertainty or uncontrollability are associated with negative outcome expectancies and emotional deficits (i.e., poorer psychological adjustment) in individuals with long-standing asthma (e.g., Mullins et al., 1997).

An examination of pre-post differences in task attributions for individuals receiving response-noncontingent feedback may offer a more complete explanation of the observed performance deficits. It was noted previously that HC individuals in the noncontingent feedback condition externalized the cause of their failure, whereas AS participants made more personal causal inferences following unsuccessful performance. In turn, this increase in internal attributions following response-noncontingent failure was associated with poorer anagram performance. Previous studies have found similar tendencies in depression-prone individuals to make internal causal attributions for performance following failure, which result in poorer cognitive performance (e.g., Greenberg, Pyszczynski, Burling, & Tibbs, 1992). Thus, our results may reveal a cognitive pattern in some youths with AS similar to what Greenberg and Pyszczynski (1986) have labeled “depressive self-focusing style” (p. 1039). This depressive cognitive style is believed to hinder problem solving primarily because excessive negative self-focus results in both cognitive and emotional reactivity, subsequently interfering with an individual’s ability to focus on the external demands of the task at hand (e.g., Ingram, Bernet, & McLaughlin, 1994; Ingram, Johnson, Bernet, Dombek, & Rowe, 1992).

Perhaps because long-term management of childhood asthma requires such a high degree of self-monitoring and sensitivity to physical signs, out of necessity, individuals develop an internal self-focusing cognitive style characterized by a heightened sense of personal responsibility for both positive and negative disease outcomes. Indeed, studies have found that children’s health-specific locus of control becomes more internally focused following participation in asthma education programs designed to enhance self-management (e.g., Kubly & McClellan, 1984). Our data suggest that such an internally focused cognitive style may be highly functional for disease management when situations are actually modifiable, but potentially results in cognitive (i.e., problem solving) and emotional (i.e., depression) deficits when uncontrollable or noncontingent situations are encountered (see Chaney et al., 1996; Metalsky & Joiner, 1992). Under such conditions of low perceived instrumental control, adaptive attributions of personal responsibility (“What can I do about the situation?”) may be replaced with maladaptive attributions of personal blame (“What is wrong with me?”), leading to decreased self-efficacy, adjustment difficulties, and inadequate behavioral responses to illness events (see Shaver & Drown, 1986).

Alternatively, it is possible that the observed pattern of attributions and problem-solving deficits were a function of a predisposing vulnerability to cognitive/emotional reactivity secondary to depression, independent of asthma or its treatment. This interpretation would be consistent with recent reports identifying unique subgroups of children with asthma that may have a comorbid genetic risk for both depression and asthma (e.g., Wamboldt, Weintraub, Krafchick, & Wamboldt, 1996). Similarly, certain groups of children with asthma have been shown to demonstrate a predilection for excessive negative emotional and physiologic reactivity to environmental challenge (e.g., Miller & Wood, 1994, 1997). In essence, our results could indicate that negative affect in response to noncontingent failure exacerbates an internal focus on negative emotion in individuals who are already predisposed toward this depressive self-focusing style (see Ingram et al., 1992). Although speculative, this interpretation may suggest that helplessness/depression and excessive emotional reactivity promote negative self-focus or problem-solving deficits in some children with asthma, which ultimately contribute to a downward spiral of ineffective responses to disease events, poor asthma management, and continued adjustment difficulties (see Miller & Wood, 1997). Clearer understanding of the potential reciprocal influences of depression, negative self-focus/learned helplessness, and psychophysiological reactivity may shed light on the puzzling observation that despite their increased vigilance for physical signs, individuals with asthma do not always take appropriate ameliorative steps in response to their symptoms (e.g., Priel, Heimer, Rabinowitz, & Hendler, 1994).
The implications of our findings are qualified by several limitations. First, the AS sample consisted of individuals who were self-identified as having asthma, and we did not employ specific measures of asthma knowledge, asthma subtype (e.g., seasonal vs. perennial, adult-relapse vs. continuous course [Oosaki, Mizushima, Kawasaki, Hoshino, & Kobayashi, 1994]), or disease severity (e.g., utilization of medical facilities, number of hospitalizations, emergency room visits, etc.). Consequently, we do not know the extent to which results were influenced by inadequate self-management knowledge or specific illness parameters. Second, participants were primarily Caucasian, from the upper-middle class, and from a select college population. In light of evidence suggesting that ethnic minority youths from impoverished environments are at increased risk for asthma morbidity/mortality (Weiss, Gergen, & Crain, 1992), caution should be exercised in generalizing our findings to clinic samples of children and young adults with asthma from different socioeconomic and cultural environments. Finally, although results were consistent with a learned helplessness conceptualization, this does not mean that all youths with asthma will respond to situations in a helpless manner. Similarly, we cannot say unequivocally that the intermittent and variable features of asthma were solely responsible for our findings. Like the illness itself, the cognitive and emotional functioning of individuals with asthma is highly variable and involves a host of family, academic, and psychological factors (e.g., Miller & Wood, 1993, 1994), any number of which could have potentially influenced our results. However, it could be argued that, except for environmental noncontingency due to asthma, these multiple factors should have operated in much the same way to influence the psychological functioning of healthy individuals in our study who did not demonstrate problem-solving deficits in response to noncontingent failure. Nevertheless, results of this investigation should be considered within the context of established findings, particularly those pertaining to the multiple-level influences on children’s functioning.

Despite these considerations, our findings are noteworthy in that they represent the only known experimental demonstration of the potential long-term effects of pediatric asthma. Moreover, our results have direct implications for the management of asthma. First, most pediatric asthma treatment protocols emphasize teaching self-management skills so that patients develop the ability to evaluate relevant behavioral/physiological information and develop appropriate problem-solving strategies (Creer et al., 1992a; Heerman & Wills, 1992). Our results suggest that treatment interventions that combine more realistic expectations of disease control with the factual content of existing asthma knowledge programs may be more effective in minimizing potential problem-solving and emotional obstacles to self-management (see Winder, 1984).

Helping children and their families to distinguish between specific aspects of asthma management that are more controllable (e.g., medical regimens, responses to episodes, daily activities) from those that are less controllable (e.g., unpredictable disease course, controlling every episode) may promote a healthier focus on appropriate illness demands. Such strategies may actually enhance problem solving by decreasing unnecessary personal blame and failure attributions in situations where personal control is unattainable.

Second, our data may also highlight the need to incorporate more formally the variable nature of pediatric asthma into self-management programs. Specifically, Creer and Bender (1993) have pointed out that, despite the demonstrated success of asthma self-management programs, most are designed largely to address the needs of children with asthma as a group and do not take into account fully the idiopathic presentation of a given child’s asthma. Although uniformed delivery of asthma treatment offers several advantages over more individualized approaches (e.g., convenience, comparability, ensuring minimal competencies), the major drawback is that some components of self-management protocols (e.g., learning more asthma facts) will not apply to the unique psychosocial needs of particular children and their families. More importantly, specific psychosocial components of self-management training such as attitudes, emotions, and family/interpersonal issues may not receive the level of attention necessary to achieve adequate illness control (Clark, 1998). Because of the tremendous intra- and interindividual variability that exists in pediatric asthma, treatment programs should likewise allow for sufficient flexibility to address areas of particular concern for a given child and his or her family, especially in cases where psychological adjustment issues are involved in self-management (see Creer et al., 1992b; Kotses, 1998).
Although these implications are consistent with our findings, they are speculative and require additional research. Specifically, experimental demonstrations of problem-solving deficits in younger children are needed before definitive statements can be made regarding the clinical relevance of our findings for the long-term management of pediatric asthma. Future investigations should also include both psychosocial (e.g., perceived control, family environment) and physiologic (e.g., pulmonary functioning) parameters to examine their relationship to the cognitive and emotional responses of children to experimental noncontingency. We believe that the learned helplessness conceptualization and experimental procedures described in this study will prove to be a useful research paradigm for examining the multiple influences on pediatric asthma adjustment and management.

Acknowledgments

This project was supported by an Oklahoma State University College of Arts and Sciences Research Award to John M. Chaney. We express thanks to the participants and to the anonymous reviewers for their careful reviews and helpful comments on earlier drafts of this article.

Received April 14, 1998; revisions received September 15, 1998; accepted September 18, 1998

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