Journal of Consulting and Clinical Psychology
1994, Vol. 62, No. 2, 324-332

0022-006X/94/$3.00

Primary and Secondary Control Among Children Undergoing Medical Procedures: Adjustment as a Function of Coping Style

John R. Weisz, Mary Ann McCabe, and Marie D. Dennig

The literature suggests that optimal adjustment to relatively uncontrollable stressors may require adjusting oneself to the stressors rather than trying to alter them. This possibility was explored, for low-controllability stressors (e.g., painful medical procedures) associated with leukemia. Children's reports of coping strategies and goals were classified as primary control coping (attempts to alter objective conditions), secondary control coping (attempts to adjust oneself to objective conditions), or relinquished control (no attempt to cope). Secondary control coping was positively associated with (a) general behavioral adjustment assessed by the Child Behavior Checklist and (b) illness-specific adjustment assessed by children's own distress ratings and by behavioral observations during painful procedures. All significant group differences showed better adjustment among secondary control children than among the primary or relinquished groups.

Research on coping with stressful medical conditions and procedures has been increasingly linked to research on control-related beliefs and behavior. This is true of research with adults (see, e.g., Taylor, 1983, 1989; Taylor, Lichtman, & Wood, 1984; Thompson, 1981) and children (see, e.g., Altshuler & Ruble, 1989; Compas, Malcarne, & Fondacaro, 1988; Weisz, 1990). Compas (1987) suggested that children's ability (perceived or actual) to exert personal control over a stressor may be a determinant of which coping strategies are adaptive; Peterson (1989) made a similar point with reference to children's coping with stressful medical procedures. Worchel, Copeland, and Barker (1987) showed that different control-related coping strategies (behavioral, decisional, and cognitive control) may each be significant predictors of adjustment in pediatric oncology patients (see also Nannis et al., 1982). In several ways, then, coping and control appear to be linked.

Consistent with this linkage, at least one theoretical model of control—the *primary–secondary control model* (Rothbaum, Weisz, & Snyder, 1982; Weisz, Rothbaum, & Blackburn, 1984a, 1984b)—has been used explicitly to guide the study of coping. According to the primary–secondary model, people pursue control through two distinct but complementary processes: *Primary control* consists of efforts to enhance reward or reduce punishment by modifying objective conditions (e.g., environmental events, one's grade in a class, other people's behavior) to bring those conditions into line with one's wishes; *secondary control* consists of efforts to enhance reward or reduce punishment by modifying oneself (e.g., one's hopes, expectations, attributions, interpretations of events) so as to achieve goodness of fit with prevailing conditions. Band and Weisz (1988) used a coding system derived from the primary–secondary model to study children's self-reports of how they had coped with stressful events. Six types of everyday stressors were surveyed, including academic failure, peer problems, and one presumably relatively uncontrollable medical stressor (i.e., getting an injection). Across the sample, aged 6–12 years, Band and Weisz found a theoretically important main effect for type of stressor ($p < .001$): Secondary control responses were more pronounced for the low-controllability medical stressor than for other stressors (three pairwise differences were significant at the .01 level). This pattern was reminiscent of findings by Folkman, Lazarus, Dunkel-Schetter, DeLongis, and Gruen (1986) with adults and Forsythe and Compas (1987) with children, indicating that cognitive appraisals of the changeability or controllability of stressors significantly influence choices of which coping method to use.

Findings pointing to such situational differences in children's approaches to coping (see also Bull & Drotar, 1991) lead directly to the question of which methods of coping are most adaptive for children in various stressful situations. As noted earlier, Compas (1987) suggested that what is adaptive for controllable stressors may differ from what is adaptive for relatively uncontrollable stressors. For example, he argued that cognitive strategies involving reframing a stressor may be appropriate and adaptive for low-controllability events such as surgery but

John R. Weisz, Department of Psychology, University of California, Los Angeles; Mary Ann McCabe, Department of Hematology/Oncology, Children's Hospital National Medical Center, Washington, DC; Marie D. Dennig, Department of Psychology, University of California, Los Angeles.

This research was facilitated through grants to Mary Ann McCabe (Public Health Service Grant 1 R03 CA41200-01) awarded by the Division of Cancer Prevention and Control, National Cancer Institute, and to John R. Weisz (National Institute of Mental Health Grants R01 MH49522 and R01 MH38240).

We are grateful to Margaret Douglas, Louise Huang, Elizabeth Jackson, and Tammy Mukoyama for their help with various aspects of the study. We also thank Sanford Leikin and the staff and families in the Department of Hematology/Oncology, Children's Hospital National Medical Center, for their generous participation.

Correspondence concerning this article should be addressed to either John R. Weisz, Department of Psychology, Franz Hall, University of California, 405 Hilgard Avenue, Los Angeles, California 90024-1563, or Mary Ann McCabe, Department of Hematology/Oncology, Children's Hospital National Medical Center, 111 Michigan Avenue, NW, Washington, DC 20010.

not adaptive for addressing interpersonal problems that are potentially controllable by the child. Compas and his colleagues presented findings consistent with this perspective, drawing on the important distinction between *problem-focused coping* (i.e., efforts to act on the source of stress, so as to change it) and *emotion-focused coping* (i.e., efforts to regulate emotional states associated with stressors; see Folkman & Lazarus, 1980; Lazarus & Folkman, 1984; also see related child work by Bull & Drotar, 1991, and Wertlieb, Weigel, & Feldstein, 1987).[1]

To explore the adaptive implications of problem-focused and emotion-focused coping, Compas et al. (1988) studied 10–14-year-olds' self-reports of how they coped with various stressors and their self-reports of behavioral and emotional problems. A key finding was that youngsters who reported the most problems tended to use coping methods that were out of synch with the controllability of the stressors. That is, more problems were reported for youngsters who generated few problem-focused coping responses for stressors rated high in controllability and for those who generated many problem-focused coping responses to stressors rated low in controllability. Similar results were found by Forsythe and Compas (1987).

The work of Compas and his colleagues thus indicates that the adaptive or adjustment value of a coping response may depend on the controllability of the stressor. This, in turn, suggests that responses intended to modify objective conditions related to the stressor (i.e., responses that fit the broad class of primary control) may be adaptive for relatively controllable stressors, but not for relatively uncontrollable stressors. For stressors that are low in controllability, coping that involves adjusting oneself to the stressor (e.g., responses within the broad class of secondary control) may actually be more adaptively useful.

In this study, we addressed this general issue of adaptability, focusing on a class of medical stressors that appeared to be particularly low in controllability. We conducted structured interviews with children who had been diagnosed with leukemia, asking them about coping with the disease and its treatment. We coded their responses according to the primary–secondary control model described earlier. Then, like Compas et al. (1988), we assessed the relation between children's coping descriptions and their adjustment. We focused on (a) general adjustment, as reflected in parents' reports of the children's behavioral and emotional problems, and (b) illness-specific adjustment related to leukemia and its treatment, as reflected in the reports of trained observers and of the children themselves.

Method

Children diagnosed with leukemia were interviewed to assess their preferred coping approaches for specific stressors related to leukemia and its treatment. As an index of the children's general behavioral adjustment, their parents completed a checklist of behavioral and emotional problems. As indexes of illness-specific adjustment, we used a self-report distress measure completed by the children and an observational measure of distress completed by two trained observers.

Sample

The sample included 33 children diagnosed with acute lymphocytic leukemia, the most common form of cancer in children. Children were included if their leukemia had been in remission for at least 1 month and if they were currently receiving treatment to maintain remission. An initial pool of 40 children met the inclusionary criteria; 36 parents gave consent for participation, but 3 of the 36 children chose not to participate. In the resulting sample of 33, ages ranged from 5 through 12 years, with a mean of 8.1 years. With 20 boys and 13 girls, the sample was 61% male (close to the 57% average found in surveys of children with leukemia; see Baehner & Miller, 1984) and 82% White (with 1 Asian, 2 Hispanic, and 3 African-American children), with 76% living in two-parent families. On the Hollingshead (1965) two-factor socioeconomic status index, on the basis of parental occupation and education, the families formed a normal distribution, ranging from lower (Class 5) to upper (Class 1), with a mean of 2.9.

Time since diagnosis for study participants ranged from 2 to 78 months, with a mean of 23.33 months. Risk status at diagnosis was rated by the children's physicians, using Children's Cancer Study Group criteria involving child age, gender, white blood cell count, and disease involvement in other organ systems; 9 children (27% of the sample) were rated "good," 10 (30%) "average," and 14 (42%) "poor."

Assessment of Child Coping

Children were administered a structured interview designed to elicit descriptions of coping with respect to four stressors associated with leukemia and its treatment: staying in the hospital overnight, undergoing bone marrow aspiration (BMA) or lumbar puncture (LP) procedures, vomiting, and hair loss.[2] The interviewer recorded up to three coping strategies (i.e., methods of coping) for each stressor; for each strategy the interviewer probed for the associated coping goal by asking "How does [the strategy identified] help?" Also for each strategy, the interviewer asked "How much do you try to [cope in the manner described]?" Answers ranged from 1 (*I almost never try this*) to 5 (*I almost always try this*). For children who identified more than one strategy, the interviewer asked which one "is the best" and which one is "the next best." The strategy identified as the best was nearly always rated as the one children tried the most; however, in the few instances in which another strategy was rated as more likely to be tried, that strategy was coded exactly the same (see the coding system, described next) as the strategy rated the best. Thus, the analyses reported focus on the one coping strategy rated the best and its associated goal in each child's interview for each stressor considered separately.

Primary–secondary control coding system for coping data. Children's coping strategies and goals were coded separately (a surprisingly unusual procedure in coping research), using a classification system that was based on the primary–secondary control model (see Rothbaum et al., 1982; Weisz et al., 1984a, 1984b). In general, primary control coping responses are those that involve attempts to directly interact with the environment so as to modify objective circumstances in ways that reduce punishment or enhance reward. Secondary control coping responses are those involving primarily internal responses aimed at attempting to adjust oneself (e.g., one's beliefs, hopes, goals, inter-

[1] To assess possible overlap between the problem-focused–emotion-focused distinction and the primary–secondary control distinction, we coded coping interview data from our study into not only primary–secondary–relinquished categories but also a problem-focused coping category and two more emotion-focused categories (i.e., "social–spiritual support seeking" and "alternate activity"). We found some significant correlations between the two systems. For example, for goal responses, the primary control and problem-focused codes were correlated .65, and the secondary control code was correlated .47 with social–spiritual support seeking and .20 with alternate activity.

[2] Children were also asked other questions (e.g., whether there were things that could be done to get well and to stay happy), but these were not used in our study.

pretations, attributions) to objective circumstances so as to achieve goodness of fit with those circumstances, thus reducing punishment or enhancing reward. Finally, relinquished control consists of the absence of attempts at primary or secondary control (e.g., "giving up" or concluding that "there is nothing I can do"), that is, the absence of attempts to enhance reward or reduce punishment.

Primary–secondary coding systems have been used to classify children's coping descriptions in previous research (Band & Weisz, 1988, 1990). However, in our study, unlike in previous studies, primary–secondary coding was applied to leukemia-related content, so examples may be helpful. An example of a primary control coping strategy is "taking medicine on time," and an associated primary control coping goal is "to kill the leukemia cells." By contrast, an example of a secondary control coping strategy is "trying to think on the good side," and an associated secondary control coping *goal* is "not to worry so much." Of course, it was also possible for a child's strategy to be coded differently from her or his goal (e.g., if the child stated a primary control strategy of "taking medicine on time" but gave a secondary control goal, such as "not to worry so much"). Finally, in cases in which a child was not able to identify any coping strategy, or explicitly stated that one did not exist, the strategy response was coded as relinquished control. Similarly, if a child identified a coping strategy but could not identify any goal for the strategy, or explicitly stated that the strategy would not help in any way, the goal response was coded as relinquished control.

Coding procedures and reliability assessment. Strategy and goal statements were coded by trained raters who were unaware of subject identity, age, and gender. To protect against subject-based rater bias, we grouped and coded the responses separately for each stressor rather than having all responses of an individual coded at one time. Thus, each coder was unaware of any pattern that may be seen for any child. In addition, to ensure the independence of strategy coding and goal coding, we typed strategy statements and goal statements on separate sheets and coded them separately. Interinterviewer reliability was assessed by having two coders independently classify all of the responses from 20 randomly selected children in the sample. This constituted a total of 80 strategy statements and 80 goal statements. Interrater reliabilities, in the form of Cohen's kappas, were .95, .86, and .97, respectively, for primary, secondary, and relinquished strategy ratings and .81, .73, and .99, respectively, for primary, secondary, and relinquished goal ratings. Landis and Koch (1977) rated "strength of agreement" as moderate for kappas of .41–.60, substantial for kappas of .61–.80, and almost perfect for kappas of .81–1.00.

Assessment of Children's Adjustment

Our measures of children's adjustment included two that were illness specific (discussed in McCabe & Pellegrini, 1989, 1992) and one that focused on more general behavioral adjustment.

Illness-specific adjustment: 1. Self-reported distress. Children rated their own level of distress with respect to 10 leukemia treatment-related stressors: (a) "finding out you had leukemia," (b) "going into the hospital to stay over," (c) "getting examined by a nurse or a doctor," (d) "getting a bone marrow [procedure]," (e) "getting a spinal tap [procedure]," (f) "having blood taken out of your arm," (g) "getting medicines in the clinic," (h) "taking medicines at home," (i) "losing your hair from the medicines," and (j) "getting sick (throwing up) from the medicines." Children indicated how unhappy, scared, or upset each stressor made them feel by pointing to one of five drawings of faces with expressions ranging from scared and frowning to cheerful and smiling. The scale for each item thus ranged from 1 (smiling face labeled *not at all upset*) through 5 (frowning face labeled *very, very upset*). Internal consistency was reflected in a Spearman-Brown split-half correlation of .83 and Cronbach's alpha of .66. Test–retest reliability, at a mean interval of 4 weeks, was .64. Two scores were used in the analyses: the total mean was the mean distress rating across all 10 stressors; the focal mean was the mean distress rating across the specific medical stressors that were the focus of the coping interview (i.e., hospital stay, bone marrow, spinal tap, losing hair, sick from medicines).

Illness-specific adjustment: 2. Observational Scale of Behavioral Distress (OSBD). The OSBD (Jay, Ozolins, Elliott, & Caldwell, 1983) was used to assess behavioral distress during regularly scheduled BMA or LP procedures. The OSBD targets 11 behaviors (e.g., muscular tension, crying, screaming, flailing) that are considered to reflect anxiety, pain, or other distress in children. These behaviors are coded for occurrence in 15-s intervals across different phases of the procedure. We focused on three phases: (a) prep, physician enters treatment room where the child is waiting; (b) procedure, cleansing and the procedure; and (c) post, recovery period after needle removal. Mean distress scores were generated for each phase, together with a mean weighted sum representing the total distress score for the procedure.

Evidence for the validity of the OSBD has been reported by Jay and colleagues (Hubert, Jay, Saltoun, & Hayes, 1988; Jay & Elliott, 1984), with OSBD scores correlating significantly with parent and medical staff ratings of the child's state and trait anxiety, children's self-reports of anticipated and experienced pain, and relevant physiological measures (e.g., pulse rate). Interrater reliability of the OSBD ratings, expressed in the form of Pearson product–moment correlations, has been reported to range from .80 to .91 (Jay et al., 1983). For our sample, we used two trained OSBD raters, who overlapped on 6 (i.e., 21%) of the study observations. Interrater agreement in the form of a Pearson correlation for the total frequencies of distress behaviors across the 11 categories was .99. Cohen's kappa for exact agreement by category was .83.

We obtained OSBD data for 29 of the children, 10 for BMA and 19 for LP.[3] Distress scores did not differ significantly for BMA versus LP children during the procedure or post phases, but BMA children showed greater distress than LP children during the prep phase, $t(27) = 3.15$, $p < .01$. Such comparisons are difficult to interpret because procedures were confounded with groups. For the sample of 29, there was no significant correlation between distress and duration of the procedure in any of the three phases or for scores summed across the three phases.

General behavioral adjustment: The Child Behavior Checklist (CBCL). Parents filled in the CBCL (Achenbach & Edelbrock, 1983) for their children. The CBCL lists 118 behavioral and emotional problems (e.g., "argues a lot," "unhappy, sad, depressed"); for each problem, parents circle 0 (not true), 1 (somewhat or sometimes true), or 2 (very true or often true). Of interest here were CBCL T scores for Total Problems, Internalizing (e.g., fears, worries, sadness), and Externalizing (e.g., fighting, disobedience, hyperactivity) scales; these T scores reflect a child's level of problem behavior relative to national norms for the child's gender and age group. We scored the CBCL in two ways,—first conventionally, then omitting problems that might have resulted from leukemia or its treatment (e.g., headaches, stomachaches); however, scores were virtually identical with the two methods (correlations be-

[3] This reflects an "era effect" in leukemia treatment. Our original research procedure involved collection of Observational Scale of Behavioral Distress (OSBD) ratings only during bone marrow aspiration (BMA) procedures. However, after we had collected OSBD data for 10 children, medical treatment protocols stopped requiring routine BMA procedures but did require routine lumbar puncture (LP) procedures. Thus, for the last 19 of our children, we collected OSBD data during the required LP procedures. The BMA and LP procedures, although different, have a number of similarities, and both are painful. However, because the two procedures are different, we complemented our primary analyses of OSBD data for all children with parallel analyses using only the subgroup of 19 children whose OSBD ratings were made during the LP procedure.

Table 1
Intercorrelations Among Coping Measures

Coping measure	Primary strategy	Secondary strategies	Relinquished strategies	Primary goals	Secondary goals	Relinquished goals
Primary strategies	—	−.498**	−.855***	.722***	.253	−.758***
Secondary strategies		—	−.024	−.138	.224	−.032
Relinquished strategies			—	−.749***	−.425*	.893***
Primary goals				—	−.092	−.761***
Secondary goals					—	−.576**
Relinquished goals						—

* $p < .05$. ** $p < .01$. *** $p < .001$.

tween conventional and adjusted scores were .99 for the Total Problems, .98 for Internalizing, and .99 for Externalizing scales). Thus, we relied on conventional scoring for the analyses to enhance comparability of our scores with those of other studies using the CBCL.

Results

We began our analyses by focusing on relations among the coping measures. We then checked for age and gender effects on all of the main measures. Then we turned to the principal analyses of the study (i.e., those bearing on relations between coping and adjustment).

Relations Among Coping Measures

Table 1 shows intercorrelations among the primary–secondary-relinquished coping measures; each measure reflects the number of responses that were classified into a particular coping category (e.g., primary control coping). With two-tailed alpha at .05, and population correlation at .40, the power to detect a significant correlation in this sample was .65. The table reflects, to some extent, the zero-sum relationships among the strategy ratings and among the goal ratings. That is, for example, if 75% of a child's strategy responses across the various stressors were classified as primary, then secondary and relinquished ratings could sum to no more than 25%. Thus, it is not surprising that such categories as primary strategies and secondary strategies were negatively correlated. On the other hand, relinquished strategies and secondary strategies were essentially uncorrelated. Of special interest in the table are the relations between strategy codes and goal codes; the table indicates that primary strategies were often associated with primary goals, that relinquished control strategy codes were often associated with relinquished goals, but that secondary strategies were only weakly related to secondary goals. This aspect of the table suggests that there is value in separating the coding of strategies from the coding of goals; thus, we retained this separation in the analyses.

Testing the Relation of Age and Gender to Coping and Adjustment Measures

Because a principal objective of the study was to examine relations between coping methods and child adjustment, we needed to assess first whether the coping and adjustment measures may be related to child age or gender. First, we computed the correlations of age and gender with the six primary–secondary coping variables (i.e., total primary, secondary, and relinquished for strategies and for goals); gender correlations were all point-biserial. None of the 12 coefficients was significant, although secondary goals were marginally more prevalent among older children ($r = .39$, $p < .10$), and relinquished control was marginally more prevalent among younger children ($r = .39$, $p < .10$).

We next computed correlations between age and gender, on the one hand, and all of the measures of adjustment used in the study, on the other (gender correlations were all point-biserial). The correlations of age and gender with the three CBCL measures (Internalizing, Externalizing, and Total Problems scales), with the three OSBD measures (i.e., distress at each of three phases), and with the 10 self-reported distress ratings (i.e., on the 10 leukemia-related stressors) revealed only two significant relationships: Self-reported distress during medical exams was correlated −.39 with age ($p < .05$), and self-reported distress during BMA procedures was rated higher by girls than boys ($r = .42$, $p < .05$); all other probability values were greater than .14.

The near absence of age effects may appear to contradict reports by Hubert et al. (1988), Jay et al. (1983), and Katz, Kellerman, and Siegel (1980) that distress during medical procedures was greater among younger than older children. However, the age ranges in those studies differed markedly from ours; the youngest group was aged 3–6 in Hubert et al., 2–6 in Jay et al., and < 1–6 in Katz et al.; our youngest child was 5. Even when we divided our sample at 6.9 years, our younger (n = 12) and older (n = 21) children differed significantly on only one of the adjustment measures (i.e., self-reported distress on medical exams). Overall, then, our analyses showed no substantial evidence of age or gender effects that could complicate interpretation of relations among coping and adjustment measures. We therefore proceeded to analyses addressing those relationships.

Overview of Main Analyses: Relation Between Coping and Adjustment

In examining relations between children's coping patterns and their adjustment, we focused first on general behavioral adjustment, assessed through parents' CBCL reports; we then examined measures of illness-specific adjustment, that is, children's self-rated distress (SRD) and observers' distress ratings on the OSBD. In each analysis, we conducted one-way analyses

Table 2
Percentage of Children Reporting Each Type of Coping for Each Stressor

Coping measure	Hospital	BMA/LP	Nausea	Hair loss
Primary strategies	58	60	52	47
Secondary strategies	19	17	0	7
Relinquished strategies	23	23	48	46
Primary goals	32	40	45	32
Secondary goals	42	23	0	8
Relinquished goals	26	37	55	60

Note. BMA = bone marrow aspiration; LP = lumbar puncture.

of variance (ANOVAs) with groups consisting of children using different coping profiles (described next); the dependent variable in each analysis was one of the adjustment measures. For ANOVAs comparing four profile groups (see the next section), with alpha set at .05, the small sample generated power of only .42 to detect an effect size of .40; for ANOVAs involving three groups, power was .44. For the significant effects reported, we note effect sizes: w^2 = (*SS* effect − *df* effect × *MS* error)/(*SS* total + *MS* error).

Defining Coping Strategy Profiles and Coping Goal Profiles

Strategy and goal responses across the four stressors (shown in Table 2) were classified into four exhaustive and mutually exclusive profile subgroups, defined to maximize similarity in the number of children per subgroup. The four subgroups formed for strategy responses were (a) primary control (i.e., more than half of the responses were coded as primary control coping, and no response was coded as secondary); (b) relinquished control (i.e., more than half of the responses were coded as relinquished control, and no response was coded as secondary); (c) primary–relinquished (i.e., half of the responses were coded as primary, and half were coded as relinquished); and (d) secondary control (i.e., one or more responses were coded as secondary).

For goal responses, the same four exhaustive and mutually exclusive coping profile subgroups were used, but with slightly different operational definitions: (a) primary control (i.e., half or more of the responses were coded as primary control, but no more than one secondary and/or one relinquished), (b) relinquished control (i.e., half or more of the responses were coded as relinquished control, but no more than one primary and/or one secondary), (c) primary–relinquished (i.e., half of the responses were coded as primary, and half were coded as relinquished), and (d) secondary control (i.e., half or more of the responses were coded as secondary control, but no more than one primary and/or one relinquished).

General Behavioral Adjustment (CBCL) as a Function of Coping Profile

CBCL scores and coping strategies. The one-way analyses of variance (ANOVAs) relating strategy profiles to CBCL Total Problems, then to Internalizing and Externalizing, all revealed similar and significant group effects. The CBCL Total Problems score showed a significant group effect, $F(3, 26) = 4.42$, $p = .01$, $w^2 = .28$. As shown in Table 3, youngsters in the secondary control group showed lower problem scores than children in the other three groups. Tukey's honestly significant differences (HSD) tests indicated that only the secondary versus primary group difference was significant ($p < .05$). We explored further the group effect on Total Problems, using separate analyses of CBCL Internalizing and Externalizing problem scores.

For Internalizing problem scores, the group effect was significant, $F(3, 26) = 3.72$, $p = .03$, $w^2 = .23$. Youngsters in the secondary control group showed lower problem scores than children in the other groups (see the means in Table 3). Tukey's HSD tests indicated that only the secondary versus primary group difference was significant ($p < .05$).

For Externalizing problem scores, the group effect was significant, $F(3, 26) = 3.23$, $p = .04$, $w^2 = .20$. Youngsters in the secondary control group showed lower problem scores than children in the other groups (see the means in Table 3). Tukey's HSD tests indicated that only the secondary versus primary group difference was significant ($p < .05$).

CBCL scores and coping goals. The one-way ANOVAs relating goal responses to the Total Problems, Internalizing, and Externalizing scales revealed effects that were statistically significant, similar to one another, and similar to the effects found for strategy responses (see Table 3). Again, CBCL Total Problem scores showed a significant group effect, $F(3, 21) = 5.33$, $p = .008$, $w^2 = .37$. Youngsters in the secondary control group had lower scores than children in the other groups. Pairwise Tukey's HSD tests indicated that the secondary control group had significantly lower total problems than each of the other three groups (all *p*s < .05). Again, we broke down this finding for Total Problems scores by focusing separately on Internalizing and Externalizing scores.

For Internalizing problem scores, the group effect was significant, $F(3, 21) = 4.19$, $p = .02$, $w^2 = .30$. As in the results reported previously, youngsters in the secondary control group showed lower problem scores than children in the other groups (see the means in Table 3). Tukey's HSD tests indicated that the secondary group differed significantly from both the primary and the primary–relinquished groups (both *p*s < .05).

For Externalizing problem scores, the group effect was significant, $F(3, 21) = 6.71$, $p = .003$, $w^2 = .44$. Children in the secondary control group showed lower problem scores than did children in the other groups (see the means in Table 3). Tukey's HSD tests indicated that the secondary control group showed significantly lower Externalizing problem scores than each of the other three groups (all *p*s < .05).

Tests of clinical significance. To test the clinical significance of the CBCL findings, we conducted six chi-square analyses of the extent to which children in the various coping profile groups scored in the "clinical" range. Because CBCL scores were generally low in this special sample, we defined the clinical range liberally to include T scores of 60 (i.e., 1 *SD* above the norm group mean) and higher. When we focused on the four coping strategy profiles (see Table 3), we found that no child with a secondary control coping profile scored in the clinical range on the CBCL Total Problems, Internalizing, or Externalizing scales; by contrast, 50% of nonsecondary copers (i.e., all other

Table 3
Mean Scores for General Behavioral Adjustment (CBCL) and Illness-Specific Adjustment (SRD and OSBD) as a Function of Coping Patterns

Variable	Primary	Relinquished	Primary–relinquished	Secondary	*p*
Coping strategy profiles					
CBCL Total Problems	59.91	57.50	50.20	41.86	.01
CBCL Internalizing	60.18	54.25	55.00	44.00	.03
CBCL Externalizing	57.18	57.00	47.60	41.57	.04
SRD Total Distress score	2.81	3.06	3.08	2.56	*ns*
SRD Focal Distress score	3.36	3.52	3.80	3.03	*ns*
Coping goal profiles					
CBCL Total Problems	57.14	54.50	58.60	35.50	.008
CBCL Internalizing	57.57	52.33	62.20	40.50	.02
CBCL Externalizing	55.86	55.00	53.80	35.00	.003
SRD Total Distress score	2.79	2.93	3.23	2.05	.06
SRD Focal Distress score	3.69	3.54	3.83	2.30	.01
Medical procedure coping strategy					
OSBD for prep phase	1.88	0.56		0.18	.02
OSBD for procedure phase	3.18	2.30		1.99	*ns*
OSBD for post phase	0.68	1.42		0.30	*ns*
Medical procedure coping goal					
OSBD for prep phase	1.52	1.21		1.00	*ns*
OSBD for procedure phase	3.44	2.50		2.18	*ns*
OSBD for post phase	0.43	1.52		0.17	.02

Note. CBCL = Child Behavior Checklist; SRD Total Distress = mean self-reported distress across 10 leukemia-related stressors; SRD Focal Distress = mean self-reported distress across the specific stressors used in the coping interview; OSBD = Observational Scale of Behavioral Distress.

profiles) scored in the clinical range on the Total Problems and Internalizing scales, and 35% scored in the clinical range on Externalizing scale. The full chi-square table was significant for Total Problems ($p = .03$) and Internalizing ($p = .05$) and marginal for Externalizing ($p = .06$).

When we focused on the four coping goal profiles (see Table 3), we again found that no child with a secondary control coping profile scored in the clinical range on the CBCL Total Problems, Internalizing, or Externalizing scales; among the nonsecondary copers (i.e., all other profiles), though, 44% scored in the clinical range on Total Problems and Internalizing and 28% scored in the clinical range on Externalizing. However, the chi-square test was not significant for any of the tables. To summarize, none of the secondary control copers scored in the clinical range on any of the six comparisons, but an average of 42% of those children who reported nonsecondary coping scored in the clinical range across the six comparisons.

Illness-Specific Adjustment: 1. Self-Reported Distress and Coping Profile

Self-reported distress and coping strategies. One-way ANOVAs comparing the four different strategy profile groups on the SRD focal mean and the SRD total mean yielded no significant effects.

Self-reported distress and coping goals. By contrast, the one-way ANOVA comparing the four different goal profile groups on the focal mean showed a significant effect of coping strategy profile, $F(3, 21) = 4.62$, ($p = .01$, $w^2 = .31$). Tukey's HSD test revealed that the secondary control group showed significantly less distress than the other three profile groups and that the latter three groups did not differ from one another. When we replicated the goal ANOVA focusing on total mean, a similar but weaker effect emerged, $F(3, 23) = 2.87$, $p = .06$, $w^2 = .19$. The secondary control group again showed lower distress levels than the other three groups, but an HSD test showed that only the secondary group and the primary–relinquished group were significantly different (see the means in Table 3). Note that all 12 of the secondary versus other group comparisons for SRD shown in Table 3 involved lower distress scores for secondary copers than for others (sign test $p < .001$).

Self-reported distress and coping with specific stressors. The preceding analyses suggest that, in general, secondary control coping responses were associated with lower levels of distress than were other forms of coping. To complement these analyses, we carried out two other procedures to assess the consistency with which group differences took this form at the level of specific individual stressors. First, we carried out eight one-way ANOVAs (four focused on strategy responses, four on goal responses) addressing specific stressors that were listed in both the coping interview and the SRD questions: hospital overnight, bone marrow, spinal tap, and hair loss. We excluded getting sick from medicines because no children gave secondary control responses to that stressor. For each stressor, we examined the relation between the specific SRD rating and the specific coping response given by the child. Because each of these comparisons involved a single coping response, it was possible to group children into three coping groups: primary, secondary, and relinquished. Note that this grouping was based on the same coping response for the BMA and LP procedures because these two were combined in the coping interview; see "Assessment of

Child Coping," discussed earlier. Four of the eight ANOVAs showed that group differences were significant; these included strategy responses related to BMA SRD ($p < .05$, $w^2 = .15$) and LP SRD ($p < .05$, $w^2 = .13$) and goal responses related to LP SRD ($p < .01$, $w^2 = .20$) and to hospital stay SRD ($p < .05$, $w^2 = .17$). All comparisons showed that distress ratings were lower for the secondary control group than for the primary and relinquished groups (five of these were significant differences). Finally, to explore consistency in the direction of this difference, we conducted a sign test for the 16 comparisons (8 secondary vs. primary, 8 secondary vs. relinquished) involving the strategy and goal responses for the four stressors noted earlier that were included in the coping interview and the SRD ratings. Of the 16 comparisons, 14 showed that distress ratings were lower for secondary responders than for the comparison group (sign test $p < .005$). Overall, the analyses showed relatively consistent evidence that secondary control coping was associated with reduced levels of self-reported distress.

Illness-Specific Adjustment: 2. OSBD-Rated Distress and Coping Profile

Because the OSBD involved observations of the children's distress during the BMA or LP procedure only, we focused our OSBD analyses only on children's coping responses to the BMA or LP stressor question in the coping interview. This reduced the categorization of coping to the simple process of noting whether each child's response to the BMA or LP question involved primary control, secondary control, or relinquished control. The same three-group distinction applied to the strategy responses and to the goal responses. For strategies and again for goals, we carried out three one-way ANOVAs, with each ANOVA focused on one of the three phases of the procedure identified earlier.

Observer-rated distress and coping strategies. In the three analyses of strategy responses, only the ANOVA of the prep phase showed a notable effect; we conducted a Kruskall-Wallis nonparametric ANOVA because the data violated the homogeneity of variance assumption ($H = 8.08$, $p = .02$, parametric $w^2 = .14$). As shown in Table 3, children in the secondary control strategy group had lower OSBD distress ratings than children in the primary control group or the relinquished group. Mann-Whitney tests revealed that the secondary control group had lower distress scores than children reporting primary control strategies ($p = .01$).

Observer-rated distress and coping goals. Our analyses of goal responses revealed a similar pattern, albeit for a different phase of the procedure. A Kruskall-Wallis one-way ANOVA of the OSBD ratings for the post phase revealed a significant effect ($H = 7.40$, $p < .02$, parametric $w^2 = .23$). Again, secondary control copers had lower distress ratings than the primary and relinquished groups. Mann-Whitney tests indicated that the secondary group had marginally lower ratings than the primary group ($p = .07$) and significantly lower ratings than the relinquished group ($p = .02$). Finally, note that all of the 16 secondary versus other group comparisons for OSBD shown in Table 3 showed that secondary control copers had lower distress ratings than others (sign test $p < .001$).

Discussion

The findings support the general idea advanced in the introduction, and originally suggested by Compas and his colleagues (e.g., Compas, 1987; Forsythe & Compas, 1987), that with relatively low-controllability stressors (e.g., leukemia and its treatment), the most adaptive form of coping may be that which focuses not so much on altering objective events and conditions as adjusting oneself to them. In our study, the various processes of adjustment of self were grouped within the construct of secondary control coping; secondary coping responses were favorably associated with indicators of both general adjustment (CBCL scores) and illness-specific adjustment (SRD and OSBD scores). Although not all comparisons in this small sample yielded significant differences as a function of coping reports, all differences that were significant showed adjustment to be better among children who favored secondary control coping than among children who favored primary coping or relinquished control. Moreover, with 42 of the 44 group comparisons made in the study assuming this form, the three sign tests we carried out revealed a strong tendency for secondary control to be associated with more favorable adjustment than alternative forms of coping.

The similarity in findings across the various measures is noteworthy, given the different sources from which the information was drawn. Children provided coping and self-report distress data, the CBCL data were independently collected from parents, and the OSBD data came from trained observers. Given these disparate sources, it would be difficult to argue that the findings reflect a source artifact or a response bias among a single class of informants. Instead, the convergent findings, which were based on input from three different perspectives, strengthen the conclusion that secondary control coping was associated with an adaptive advantage for the youngsters studied here.

Despite the pattern of findings obtained here, we must emphasize that secondary control coping may not be the best response to all aspects of leukemia and its treatment. Most stressors, including leukemia, have more and less controllable aspects, and, as we suggested in the introduction, secondary control coping may not be the most adaptive response to more controllable stressors. In this context, we should note the findings of Band and Weisz (1990), who studied a group of diabetic youngsters. In contrast to our study, Band and Weisz targeted coping behavior with respect to relatively controllable stressors, such as diet, insulin injections, and daily glucose monitoring. Among formal operational adolescents (but not among less mature children), reports of secondary control coping in response to these more controllable stressors were actually negatively related to diabetes adjustment, as measured by parent report and medical staff report measures. Such findings, together with our findings, indicate that different medical conditions, even different aspects of the same medical condition, may differ greatly in their controllability and thus may need to be addressed by much different forms of coping. More generally, one must avoid overgeneralizing from the findings of one particular study, focused on one particular subset of stressors, and confined to one particular medical condition.

Looking toward the future, we have several suggestions to-

ward building on the base of information generated here. First, although assembling a sample for research on pediatric leukemia is a slow process, it would be useful in the long term to form a large enough sample to afford powerful tests of interactive relationships (e.g., interactions involving developmental level or gender). Band and Weisz (1990) found that the relation between coping style and adjustment was different, in some respects, for formal operational youngsters than for those who had not attained formal operations. Bull and Drotar (1991) found relevant interactions involving age and gender. It would be worthwhile to test such possibilities with larger samples and to extend the tests to groups with other illnesses.

Second, researchers need to find ways of assessing children's coping that do not rely exclusively on what children themselves are able or willing to tell them. Coding systems such as ours require information about not only what children do but why they do it (i.e., their goals) and therefore seem to necessitate child interviews (see a related point in Peterson, 1989, p. 384). However, children at different developmental levels differ from one another in their capacity to decode interview questions, introspect accurately about their behavior and motives, and encode answers. Such child-to-child variability makes it potentially useful to find supplementary sources of information on child coping from perspectives outside those of the children themselves.

Third, investigators need to find some common ground despite the heterogeneity of coping conceptualizations and coding systems used in this area of research. Across the diverse literature on child coping, conceptual distinctions such as problem-focused versus emotion-focused (Compas et al., 1988), monitoring versus blunting (Miller & Green, 1985), and primary versus secondary control (Band & Weisz, 1988, 1990) are partially confounded with stressor domains such as academic problems, delay-of-gratification tasks, and treatment for leukemia. This makes it difficult to compare findings across studies and to build a well-integrated base of knowledge about child coping and its consequences. Of course, each investigator has particular substantive interests and a particular theoretical frame of reference, and no investigator wants to sacrifice his or her own perspective in the interest of a common base of knowledge. However, there may be ways for researchers who have different approaches to find some methodological and theoretical common ground; if so, our picture of child coping and its correlates could well be enriched.

Finally, we emphasize that the methods we and others have used thus far may capture coping only in a simpleminded sense (i.e., one coping method at a time, with one goal per response). It seem likely to us that for extremely traumatic stressors, such as many of those associated with leukemia, the best coping may involve complex planning, with layered strategies of the "Plan A, Plan B" variety, and with contingencies included (e.g., what will lead to a shift from Plan A to Plan B and what to do if Plan B fails). Current coping assessment methodology falls well short of capturing such complexity and perhaps, accordingly, well short of capturing the truth about how coping actually operates in real life with really severe stressors. This, in turn, may mean that researchers have some distance to travel, methodologically, before they can speak with authority about which methods of coping with severe stressors are the most adaptive. Nonetheless, it is toward this important long-term objective that future research on coping in pediatric populations should be directed.

References

Achenbach, T. M., & Edelbrock, C. S. (1983). *Manual for the Child Behavior Checklist and Revised Child Behavior Profile.* Burlington, VT: Department of Psychiatry, University of Vermont.

Altshuler, J. L., & Ruble, D. N. (1989). Developmental changes in children's awareness of strategies for coping with uncontrollable stress. *Child Development, 60,* 1137–1149.

Baehner, R. L., & Miller, D. R. (1984). Hematologic malignancies: Leukemia and lymphoma. In D. R. Miller & R. L. Baehner (Eds.), *Blood diseases of infancy and childhood* (5th ed., pp. 619–655). St. Louis, MO: Mosby.

Band, E. B., & Weisz, J. R. (1988). How to feel better when it feels bad: Children's perspectives on coping with everyday stress. *Developmental Psychology, 24,* 247–253.

Band, E. B., & Weisz, J. R. (1990). Developmental differences in primary and secondary control coping and adjustment to juvenile diabetes. *Journal of Clinical Child Psychology, 19,* 150–158.

Bull, B. A., & Drotar, D. (1991). Coping with cancer in remission: Stressors and strategies reported by children and adolescents. *Journal of Pediatric Psychology, 16,* 767–782.

Compas, B. E. (1987). Coping with stress during childhood and adolescence. *Psychological Bulletin, 101,* 393–403.

Compas, B. E., Malcarne, V. L., & Fondacaro, K. M. (1988). Coping with stressful events in older children and young adolescents. *Journal of Consulting and Clinical Psychology, 56,* 405–411.

Folkman, S., & Lazarus, R. S. (1980). An analysis of coping in a middle-aged community sample. *Journal of Health and Social Behavior, 21,* 219–239.

Folkman, S., Lazarus, R. S., Dunkel-Schetter, C., DeLongis, A., & Gruen, R. J. (1986). Dynamics of a stressful encounter: Cognitive appraisal, coping, and encounter outcomes. *Journal of Personality and Social Psychology, 50,* 571–579.

Forsythe, C. J., & Compas, B. E. (1987). Interaction of cognitive appraisals of stressful events and coping: Testing the goodness of fit hypothesis. *Cognitive Therapy and Research, 11,* 473–485.

Hollingshead, A. B. (1965). *Two-factor index of social position.* Unpublished manuscript, Yale University, New Haven, CT.

Hubert, N. C., Jay, S. M., Saltoun, M., & Hayes, M. (1988). Approach-avoidance and distress in children undergoing preparation for painful medical procedures. *Journal of Clinical Child Psychology, 17,* 194–202.

Jay, S. M., & Elliott, C. (1984). Behavioral observation scales for measuring children's distress: The effects of increased methodological rigor. *Journal of Consulting and Clinical Psychology, 52,* 1106–1107.

Jay, S. M., Ozolins, M., Elliott, C., & Caldwell, S. (1983). Assessment of children's distress during painful medical procedures. *Journal of Health Psychology, 2,* 133–147.

Katz, E. R., Kellerman, J., & Siegel, S. E. (1980). Distress behavior in children with cancer undergoing medical procedures: Developmental considerations. *Journal of Consulting and Clinical Psychology, 48,* 356–365.

Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics, 33,* 159–174.

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping.* New York: Springer.

McCabe, M. A., & Pellegrini, D. S. (1989, June). *A multidimensional framework for adjustment in medically ill children: General and treatment-specific distress in children with leukemia.* Paper presented at the National Institute of Mental Health Conference, "Mental Health Services for Children and Adolescents in Primary Care Settings: A Research Conference." New Haven, CT.

McCabe, M. A., & Pellegrini, D. S. (1992). *Psychological adjustment in children with leukemia: The role of personal and social resources.* Unpublished manuscript, Children's Hospital National Medical Center, Washington, DC.

Miller, S. M., & Green, M. L. (1985). Coping with stress and frustration: Origins, nature, and development. In M. Lewis & C. Saarni (Eds.), *The socialization of emotions* (pp. 263–314). New York: Plenum Press.

Nannis, E., Susman, E., Strope, B., Woodruff, P., Hersh, S., Levine, A., & Pizzo, P. (1982). Correlates of control in pediatric cancer patients and their families. *Journal of Pediatric Psychology, 7,* 75–85.

Peterson, L. (1989). Coping by children undergoing stressful medical procedures: Some conceptual, methodological, and therapeutic issues. *Journal of Consulting and Clinical Psychology, 57,* 380–387.

Rothbaum, F., Weisz, J. R., & Snyder, S. (1982). Changing the world and changing the self: A two-process model of perceived control. *Journal of Personality and Social Psychology, 42,* 5–37.

Taylor, S. E. (1983). Adjustment to threatening events: A theory of cognitive adaptation. *American Psychologist, 38,* 1161–1173.

Taylor, S. E. (1989). *Positive illusions: Creative self-deception and the healthy mind.* New York: Basic Books.

Taylor, S. E., Lichtman, R. R., & Wood, J. V. (1984). Attributions, beliefs about control, and adjustment to breast cancer. *Journal of Personality and Social Psychology, 46,* 489–502.

Thompson, S. C. (1981). Will it hurt less if I can control it? A complex answer to a simple question. *Psychological Bulletin, 90,* 89–101.

Weisz, J. R. (1990). Development of control-related beliefs, goals, and styles in childhood and adolescence: A clinical perspective. In J. Rodin, C. Schooler, & K. W. Schaie (Eds.), *Self-directedness: Cause and effects throughout the life course* (pp. 103–145). Hillsdale, NJ: Erlbaum.

Weisz, J. R., Rothbaum, F. M., & Blackburn, T. C. (1984a). Standing out and standing in: The psychology of control in America and Japan. *American Psychologist, 39,* 955–969.

Weisz, J. R., Rothbaum, F. M., & Blackburn, T. C. (1984b). Swapping recipes for control. *American Psychologist, 39,* 974–975.

Wertlieb, D., Weigel, C., & Feldstein, M. (1987). Measuring children's coping. *American Journal of Orthopsychiatry, 57,* 548–560.

Worchel, F. F., Copeland, D. R., & Barker, D. G. (1987). Control-related coping strategies in pediatric oncology patients. *Journal of Pediatric Psychology, 12,* 25–38.

Received February 22, 1993
Revision received June 4, 1993
Accepted June 7, 1993 ■