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ABSTRACT

The present study examines the relationship of various cognitive and life event variables to depressive symptoms in children. The variables studied are locus of control, interpersonal and impersonal problem-solving ability, and objective and subjective life stress. Subjects were 47 students in the fourth grade, 58 students in the fifth grade, and 29 students in the sixth grade of a coeducational public school in a midwestern city. Several measures were employed, including the Nowicki-Strickland Locus of Control Scale, the Children's Depression Inventory, the Social Means-Ends Problem Solving Procedure, the Emotional Means-Ends Problem Solving Procedure, the Optional Thinking Test (Alternative Thinking), the Anagram Task, and Coddington's Life Events Scale for Children. Testing was done either in groups or individually, depending on the nature of the instrument used. Results indicate that higher levels of depressive symptoms were associated with an external locus of control, increased level of life stress, and lower performance levels on an impersonal problem-solving task. The level of depressive symptoms was also found to be inversely related to socioeconomic status as measured by father's occupation. No consistent relationship was found between depression and interpersonal problem-solving ability. (Author/RH)

Cognitive and Life Event Correlates of Depressive Symptoms in Children

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Abstract

The present study examined the relationship between a number of cognitive and life event variables and depressive symptoms in a sample of nonreferred grade school children. The results indicated that higher levels of depressive symptoms were associated with an external locus of control, increased level of life stress and lower performance levels on an impersonal problem-solving task. Level of depressive symptoms was also found to be inversely related to socioeconomic status as measured by father's occupation. No consistent relationship was found between depression and interpersonal problem-solving ability.

Cognitive and Life Events Correlates of Depressive Symptoms in Children

In contrast to the vast body of literature on adult depression generated during the past two decades, comparatively little research has focused on the concept of depression in children (Schulterbrandt & Raskin, 1977). More recently, investigators have begun to actively delineate the specific parameters of this phenomenon. The majority of these investigations have dealt primarily with issues of definition and classification (e.g., Cytryn & McKnew, 1972; Pearce, 1977, 1978), incidence (e.g., Albert & Beck, 1975; Kashani & Simonds, 1979) and assessment of children depression (Kovacs, 1981). Comprehensive reviews of this literature have also begun to emerge which attempt to synthesize the current perspectives and knowledge of childhood depression with proposed suggestions for future research (Connors, 1976; Kashani, Husain, Shekim, Hodges, Cytryn & McKnew, 1981).

While the concept of childhood depression is not without its critics (Lefkowitz & Burton, 1978), it would appear that there is a growing consensus among clinicians and researchers that depression in children can and does exist. The literature is notable, however, for a lack of research on the cognitive and life event variables that are associated with manifestations of depressive symptoms in children. The present study was designed to examine the relationship of various cognitive and life event variables to depressive symptoms in children, namely locus of control, interpersonal and impersonal problem-solving ability, and objective and subjective life stress. The first variable, locus of control, has consistently been found to have a strong relationship with depression in children, with external locus of control being strongly associated with higher levels of depression (Lefkowitz, Tesiny &

Gordon, Note 1; Moyal, 1977; Tesiny & Lefkowitz, 1982). Lefkowitz et al. (Note 1) also found that while both external locus of control and lower levels of family income were significantly correlated with high levels of depression in an independent manner, the joint effects of these two variables related to the highest depression scores. These results were interpreted in terms of a learned helplessness paradigm; that is, children who live in an improverished environment may learn that control over reinforcement is external, and that irrespective of their efforts, the environment remains unaffected.

In many cases, control over environmental reinforcers implies the availability of adaptive problem-solving strategies in an individual's cognitive and behavioral repertoire. In an adult sample, Gotlib and Asarnow (1979) found that clinically depressed college students were significantly more deficient in interpersonal problem-solving as compared to nondepressed students. Gotlib and Asarnow also found that there was no significant relationship between level of depression and impersonal problem-solving performance on an anagram task. Thus, it would appear that depression in adults is accompanied by a specific type of problem-solving deficiency, that is, decreased ability to solve problems of an interpersonal nature. Impersonal problem-solving tasks, which are more likely to be indices of general motivational level, appear to be unaffected by changes in level of depression, at least as assessed in a depressed college student sample. The question that arises is whether depressive symptoms in children are accompanied by specific types of interpersonal or impersonal problem-solving deficiencies. It would seem reasonable to postulate that children with adequate interpersonal problem-solving abilities have an internal coping mechanism for dealing with adversity, which would result in both an internal locus of control and less likelihood of experiencing depression.

Although researchers have commented on the relationship between the development of depression and adverse environmental circumstances (e.g., Kovacs & Beck, 1978; Lefkowitz, Tesiny & Gordon, Note 1) little effort has been made to operationally define and measure these circumstances with regard to depressive symptoms in children. In adult and adolescent samples, it has been found that life stress is related to depressed-distorted cognitions (Hammen, 1978) and to depressive symptomatology (Brown, Nibhrolchain & Harris, 1978; Hudgens, 1974; Paykel, 1974). It has yet to be shown, however, that the experience of stressful life events and the perceptions of those events bear any systematic relationship to depressive symptoms in children. In addition, there is no research to date that examines the interrelationships between locus of control, interpersonal and impersonal problem-solving and life stress, or how these variables may relate to depressive symptomatology in children. The purpose of this investigation was to systematically evaluate the relationship between these variables in a sample of nonreferred school-aged children.

Method

Subject Sample

A coeducational public grade school in a midwestern city (pop. 60,000) participated in the research project. The subjects consisted of 47 students in the fourth grade, 58 students in the fifth grade and 29 students in the sixth grade ($n = 134$). There were 71 males and 63 females. The age range of students was 9 to 12 years. The mean age was 10.3 years. One hundred and twenty-seven of the students were white, five were black, and two were oriental. Using the father's employment as an index of socioeconomic status, the distribution was as follows: 51.5% were professionals, executives and small business owners; 10.4% were white-collar workers; and 27.6% were blue-collar

workers. The remaining 8.3% were not classifiable based on the information received. This SES classification scheme was adapted from that of Hollingshead and Redlich (1958).

Assessment Measures

Nowicki-Strickland Locus of Control Scale (NSLOC)

The NSLOC is a paper and pencil measure consisting of 40 questions that describe reinforcement situations across interpersonal and motivational areas such as affiliation achievement and dependency (Nowicki & Strickland, 1973). This measure assesses whether the child perceives reinforcement for his or her behavior to be noncontingent and allows for a general assessment of the child's feelings of control over events in the environment. Estimates of internal consistency using the split half method ranged from $r = .68$ to $r = .74$. Test-retest reliability ranged from .63 to .71.

Children's Depression Inventory (CDI)

The CDI, a self-report inventory, consists of 27 multiple choice items that cover a variety of motivational, cognitive, affective and somatic symptoms of depression. Each CDI item assesses one symptom by presenting three choices, graded from 0 to 2 in the direction of increasing or decreasing psychopathology. The first CDI was a modification of the Beck Depression Inventory for adults and has since been revised to eliminate those items irrelevant to children (Kovacs & Beck, 1977). Internal consistency and interitem and item-total score correlations for clinic and normative samples have resulted in correlations in the moderate range (Kovacs, 1980/1981). Construct validity for this measure also has been provided (Lefkowitz & Tesiny, 1980; Schwartz, Friedman, Lindsay & Narrol, 1982; Tesiny & Lefkowitz, 1982).

The Social Means-Ends Problem Solving Procedure (SMEPS)

The children's SMEPS was developed by Shure and Spivack (1972) to assess means-ends thinking in 10-12 year old youngsters. The measure consists of six short story situations that require the child to generate means to a given end. All stories are of a social, interpersonal nature. The child's total means-ends score is composed of the number of means stated towards a given story goal and the number of obstacles that might be encountered on the way to that goal. Means-ends thinking has been shown to be a mediator of behavioral adjustment in elementary school children (Spivack, Platt & Shure, 1976).

Emotional Means-Ends Problem Solving Procedure (EMEPS)

The EMEPS is a variant of the usual MEPS procedure in that it involves the ability to deal with one's own negative emotional states (e.g., depression and anxiety). Siegel, Platt and Peizer (1976) developed four story situations to measure this aspect of problem-solving ability in adolescents and adults. These stories have been adapted so as to be oriented to younger children. The EMEPS stories are administered and scored in the same manner as the social MEPS.

The Optional Thinking Test (Alternative Thinking)

The Optional Thinking Test (OTT) was developed by Platt and Spivack (1977) to measure the ability to conceive of options of alternative solutions to hypothetical but typical interpersonal problems. The subject is asked to respond to each of four problem situations with all the possible solutions that might reconcile the situation. Alternatives are scored according to criteria and techniques which are similar to the scoring of means-ends stories.

Anagram Task

The Anagram Task used in the present study is an adaptation of the procedure developed by Schneiderman, Reber and Hainline (1978). The actual

procedure consists of presenting each of five target words (e.g., teacher, father, etc.) for three minutes. The subjects are asked to make up as many new words as possible using all or some of the letters contained in the word.

Coddington's Life Events Scale for Children (CLESC)

The CLESC was developed by Coddington (1972a, 1972b) to assess the importance of certain life events for grade school children. In this study, an interview with the child was used to assess whether 36 life events (e.g., death of a parent, suspension from school) occurred in the preceding year. Both objective and subjective ratings of life stress were calculated. Objective ratings were obtained by summing the relative weights of the items the child endorsed. The absolute number of positive items endorsed, negative items and total items endorsed were also used as objective measures of life stress. For the subjective weightings, a more elaborate procedure was utilized. When a life event was found to have occurred for a child, he/she was asked, "Was that good (for you) or bad (for you) that it happened, or neither one? How did that (it) make you feel?" Depending upon the valence of the child's answer, he/she was shown a set of three squares of increasing size. Each of these squares was labeled and assigned a value: great, (+3), good (+2), a little good (+1), awful (-3), bad (-2), and a little bad (-1). The interviewer pointed to the figures as the labels were read. The child was then asked to point to the box that best represented his/her experience at the time of the event. If the child responded that the event was neither good nor bad, a score of zero was assigned to that response.

Procedure

The administration of the research measures was accomplished in two stages. During the initial stage, half the measures were administered in group fashion to each of the eight classrooms that participated in the project.

These measures included the Nowicki-Strickland Locus of Control Scale, the Children's Depression Inventory and the Anagram Task. Those students from whom written consent had been obtained were first introduced to the researcher by the school counselor as an individual who was interested in learning how children felt about themselves. The measures were then introduced to the class and completed by each student as the researcher read aloud the individual items on the questionnaire.

The individual testing phase of the research project was conducted by two graduate students in clinical psychology from the University of Missouri. Students were chosen on a random basis from their classroom and told they would be completing the remainder of the project. They were then administered the measures in the following order: Social Means-Ends Problem-Solving Procedure, Emotional Means-Ends Problem-Solving Procedure, the Optional Thinking Task, and the Coddington Life Events Scale for Children. A graduate student in clinical psychology and one undergraduate student were provided with explicit scoring instructions for the three interpersonal problem-solving tasks and trained until a 90% agreement criterion was reached for each relevant scoring category.

Results

Demographic Variables and Depression

The mean score for the Children's Depression Inventory (CDI) was 9.65, with a standard deviation of 8.21. The mean score for boys on the CDI was 9.62 (SD = 8.69), with the mean score for girls on the CDI being 9.71 (SD = 7.7). To allow comparison across selected demographic variables, children were classified into two groups according to their CDI scores, non-depressed (CDI score 0-18) and depressed (CDI score 19-54). The cutoff score

of 19 had been previously suggested by Kovacs (1980/1981) after reviewing the psychometric properties of the CDI. Given the similarity between the mean and standard deviation reported by Kovacs and that found in the present study, the same cutoff point was utilized. According to this method of classification, 17 children (12.6%) were classified in the depressed category.

Chi-square analyses indicated that children's age and sex did not significantly differentiate the two subsamples. In addition, no significant differences were found with regard to either parent's marital status or socioeconomic status when comparing these variables across the nondepressed and depressed subsamples. There was, however, a moderate correlation between depression and father's occupational status when the depressed sample was not collapsed into subgroups (r = -.25, p = .003). Thus, increasing levels of self-reported depressive symptomatology was associated with lower socioeconomic status.

Independent Variables and Level of Depressive Symptomatology

Table 1 presents the zero-order correlations between the independent variables and level of depressive symptomatology.

Insert Table 1 here

Locus of Control and Depression

A strong positive relationship was found between level of depressive symptomatology and locus of control (r = .57, p = .001). Thus, the more external the locus of control, the higher the level of reported depressive symptoms.

Life Stress and Depressive Symptomatology

A moderate positive relationship was found between level of depressive symptomatology and the Total Life Change Units score as a measure of life

stress (r = .35, p = .001). When the number of negative life events was used as an indicant of life stress, the correlation with level of depression increased substantially (r = .47, p = .001). The child's subjective estimate of the impact of the negative event also strongly correlated with level of depression (r = .49, p = .001). No significant correlations were found between level of depression and number of positive life events experienced or the child's subjective estimate of the impact of positive events. Thus, these results provide strong evidence of a relationship between the experience of negative events in a child's life and level of depressive symptoms as indicated by that child on the CDI. Although it could be argued that locus of control accounts for part of the variance in this relationship, level of depression still correlated significantly with life stress when the variance contributed by locus of control was partialed out statistically for all three measures of life stress.

Problem-Solving Ability and Depression

There was no significant correlation found between depression scores and the total number of relevant means on either the Social or Emotional Means-Ends Problem-Solving Procedures. In addition, no significant relationship was found between depression and the number of relevant alternatives on the Optional Thinking Task. Comparisons between depressed and nondepressed groups on the interpersonal problem-solving measures yielded nonsignificant findings. There was, however, a small yet significant correlation between depression and the total number of irrelevant means on the Social Means-Ends procedure (r = .16, p = .05). Higher depression scores were, therefore, associated with the tendency to provide irrelevant means to a given end in a social problem context.

Finally, there was a negative correlation between depression and the anagram task, a measure of impersonal problem-solving ability (r = .29, p = .001). This relationship increased slightly when the effect of age was partialed out (r = .30, p = .001). Therefore, poorer performances on the impersonal problem-solving task were associated with higher levels of depression.

Regression Model

In order to determine the relative contribution of the independent variables to the variance in depression scores, a regression model was constructed using both the major hypothesized variables (i.e., locus of control, life stress, interpersonal problem-solving scores) and those variables that were found to be highly correlated with depression. These variables included all aspects of the life stress measures, locus of control, the anagrams task, demographic variables as well as each scoring component of the problem-solving stories. Each of these independent variables was utilized as predictor variables and regressed on the depression scores. A stepwise regression was computed such that those variables which accounted for the greatest amount of variance were chosen in a stepwise fashion from those entered into the model. Independent variables which did not exceed a regression coefficient of .20 were dropped from the model and the regression equation recalculated. The selection of independent variables was stopped after five variables were entered into the equation.

The final regression equation is presented in Table 2. The Nowicki-

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Insert Table 2 about here

Strickland locus of control measure accounted for the most variance (32%) when it was the initial variable entered into the equation. The next variable to enter the equation was the subjective weighting of the impact of negative

life events (9% of the variance) followed by the number of correct answers on the anagram task (2%), the total number of irrelevant means on the Social Means-Ends Problem-Solving Procedure (2%) and the number of relevant means on the "school performance" story of the Emotional Means-Ends Problem-Solving Procedure (1%). These five variables explained a total of 47% of the variance in depression scores.

Discussion

The overall results of this study indicate that the level of self-reported depressive symptoms in children is significantly related to low socioeconomic status, an external locus of control, negative life events a select aspect of interpersonal problem-solving and impersonal problem-solving ability. Of all the variables under consideration, external locus of control emerged as the most significant variable accounting for the variance in children's depression scores on the CDI. In other words, those children who perceived outcomes as beyond their control were more likely to score high on the depression measure. The relationship between locus of control and depression has similarly been found in other studies involving children, adolescents and adults (Abramowitz, 1969; Calhoun, Chiney & Dawes, 1974; Kendall, Barber & Leon, Note 2; Lefkowitz, Tesiny & Gordon, Note 1; Moyal, 1977; Tesiny & Lefkowitz, 1982).

An additional finding was that level of self-reported depressive symptoms was related in an inverse fashion to father's occupational status, a rough index of socioeconomic status. This finding is consistent with the results reported by Lefkowitz, Tesiny & Gordon (Note 1). Given the apparent relationship between depressive symptomatology, external locus of control and low socioeconomic level, it would appear that a child's mood may in large part be

determined by reality-based problems in the environment as opposed to a deficit in cognitive coping ability. This argument is strengthened by the finding that depressive symptomatology was significantly associated with the experience of high levels of negative life events in the previous year. Thus, the "triad" of variables which emerged, including locus of control, socioeconomic level, and negative life events, suggests that the dysphoric moods in the child is related to adverse environmental influences. Longitudinal studies which periodically assess these variables would be necessary in order to determine whether such factors actually contribute to the development and/or maintenance of clinical depression in either childhood or adulthood.

As mentioned previously, no significant relationship was found between levels of depression and the ability to generate relevant means or alternative solutions on the various interpersonal problem-solving tasks. Thus, depressed children were generally as capable as nondepressed children in providing cognitive solutions to social and emotional problems. It was found, however, that higher levels of depression were associated with the generation of means irrelevant to the solution of social problems. These results suggest that while depressed and nondepressed children are equally adept at formulating relevant means to a given end, depressed children are more likely to generate less effective means that would tend to result in failure experiences in social situations. The finding that both depressed and nondepressed children share the same cognitive ability to generate relevant means to a given end does, however, pose some conceptual problems for researchers in that one would expect children with higher levels of depressive symptoms to be deficient in interpersonal problem solving. It may be that a deficiency lies in the realm of performance of the requisite problem-solving behaviors as opposed to a cognitive deficit. The finding that deficient anagram task performance

is associated with higher levels of depressive symtomatology would support this argument as this task requires both cognitive and behavioral performance. It should be noted that the above results stand in contrast to the findings of Gotlib and Asarnow (1979), whose research indicated that depressed and nondepressed college students were differentiated by their ability to solve interpersonal but not impersonal problems.

An important clinical issue which emerged in the context of this study was the prevalence rate of 12% of the sample of nonreferred grade school children reporting at least a moderate level of depressive symptomatology as measured by a score of 19 or above on the CDI. This cutoff score is 1.5 standard deviations above the mean for this sample and is consistent with the findings presented by Schwartz et al. (1982). To determine whether the specific items endorsed were serious in nature, the individual items on the CDI which were endorsed by the 17 children who obtained a score of 19 or greater were compared with the criteria for a DSM-III diagnosis of depression. Fourteen of these children (10% of the total sample) endorsed CDI items which would be sufficient, under normal interview procedures, to fulfill the diagnostic criteria for a major depressive episode. While such a prevalence rate may be high for a nonreferred group of children, these findings may reflect a number of possibilities. First, the CDI may measure reality-based depression of a transient nature, thus necessitating assessment over time to evaluate the stability of depressive symptoms and to identify high risk children who maintain high scores on the CDI. On the other hand, the CDI may be measuring reality-based, nontransient dysphoria but not clinical depression, per se. Additional assessment of impaired social, affective, cognitive, and motivational functioning from a variety of sources would be necessary to address this latter possibility. Finally, the CDI may be identifying a select group

of children who are having many unhappy experiences yet are not clinically depressed. This perspective would appear to be supported by research which suggests that, while the CDI can be used as a screening measure to identify depressive symptoms, it may not provide sufficient clinical information to identify the diagnostic syndrome of depression (Carlson & Cantwell, 1980). In addition, research must address possible differences in the developmental concomitants of depression in children (Lefkowitz & Burton, 1978).

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Footnote

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Table 1

Zero Order Correlations Between Independent Variables and Level of Depression

Independent Variables	Coefficient	P
Nowicki-Strickland Locus of Control Scale		
External Locus of Control	.57	.001
Life Stress		
Total Life change units score	.35	.001
Number of Negative Events	.47	.001
Subjective Weighting of Negative Events	.49	.001
Number of Positive Events	.10	ns
Subjective Weighting of Positive Events	.04	ns
Interpersonal Problem-Solving		
Social MEPS - Relevant Means	-.04	ns
- Irrelevant Means	.16	.05
Emotional MEPS - Relevant Means	-.04	ns
Optional Thinking Task - Alternatives	-.04	ns
Impersonal Problem-Solving		
Anagram Task	-.29	.001

Table 2

Multiple R, R Squared and Beta Weight for Depression as an Independent Variable

Independent Variables	Multiple R	R^2	beta
Nowicki-Strickland LOC	.57	.32	.42
Subjective Weighting--Negative Events	.64	.41	.31
Anagram--Correct Answers	.66	.43	-.14
Total SMEPS Irrelevant Means	.67	.45	.13
Emotional MEPS School Performance Story--Relevant Means	.68	.47	.12