

The Effects Of Anxiety and Depression on Children's Utilization of Medical Health Care Services

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(ABSTRACT)

The current study was designed to examine the relationship between childhood anxiety and depression and children's rate of medical care utilization. Additionally, the model examined considered family and parental factors (family conflict, parental anxiety, parental depression, and parental somatization) as well as children's level of negative affectivity and demographic variables (age and sex). A hierarchical regression analysis was used to examine the effects of each of these variables on rate of physician utilization and to control for the effects of demographic factors, parent/family variables and negative affectivity while examining childhood anxiety and depression. Results revealed that parental anxiety and depression and family conflict contribute significantly to the explanation of children's health care utilization. Additionally, child anxiety also explained number of physician visits but only when considered in the absence of child depression.

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The Effects Of Anxiety and Depression on Children's Utilization of Medical Health Care Services

In this era of managed health care and rising costs of medical expenses, patients and doctors alike are facing a new stringency in their degree of accountability for each procedure performed and each visit made. While new guidelines can be expected to affect the American population as a whole, it can be predicted that the impact will be significant on that segment of the population whose high utilization of medical care services is highly incongruous with their physical health status. Psychological morbidity, rather than physiological morbidity, may account for the disproportionate medical services used by these individuals (Costello et al., 1988a). In fact, Eisenberg (1992) estimates that in 1989 at least 75 million physician visits were attributable to psychological factors. However, despite the frequency with which primary care physicians must deal with psychological symptoms, physicians tend not to identify psychological distress in their patients (Costello et al., 1988c; Costello & Pantino, 1987) or when they do diagnose a mental disorder they often misdiagnose (Katon et al., 1990) or fail to provide effective treatment (Eisenberg, 1992). Therefore, it is important to understand the psychological characteristics that result in increased medical utilization for purposes of identification of these persons who frequently present in primary care facilities. Further, some investigations suggest that medical care utilization rates for psychologically distressed patients decrease substantially when they begin mental health treatment (Borus et al., 1985; Finney, Riley, & Cataldo, 1991; Hankin et al., 1984; Lewis & Lewis, 1985; Mechanic, Cleary, & Greenley, 1982). This phenomenon, known as the "offset effect", also suggests the importance of identifying psychological factors related to high medical health care utilization for physician education, public policy development, and patient welfare. Therefore, motivation to initiate medical health care visits must be examined in terms of mental health status as well as physical health status. Moreover, in the case of medical utilization by children and adolescents, this investigation must be expanded to examine psychological factors in parents, inasmuch as parents often make the decision to seek medical care for their children (Hickson & Clayton, 1995; Tinsley, 1992).

In addition to physical health related factors such as chronic health problems and disability resulting from symptoms (Berkanovic, Telesky, & Reeder, 1981) certain patient characteristics have been found to be associated with high numbers of medical care visits. For example, gender has been found to correlate with physician visits, with females evidencing higher utilization rates than males (Cockerham, Kunz, & Lueshchen, 1988; Widmer & Cadoret, 1978). Additionally, socio-economic status (SES) and indicators of SES (e.g., family income) have been associated with differential rates of medical care utilization. For example, Berkano (1981) found family income to be negatively and significantly correlated with physician utilization. On the other hand, Tinsley (1992) concluded that low SES families are infrequent users of medical care, especially well-care. However, knowledge of these relationships provides little information as to the causative factors responsible for initiation of medical visits, nor does it inform intervention strategies. Therefore, factors that are amenable to intervention and that increase our understanding of help-seeking behavior in medical settings must be identified.

Patient Factors Related to High Medical Care Utilization

In this vein, several investigations have suggested that psychological distress can lead to increased reliance on various facets of the health care establishment. For example, Hankin and

her colleagues (Hankin et al., 1982) investigated the frequency and characteristics of general medical use of children and adults with a mental disorder. Specifically, number of visits made by patients with a mental disorder diagnosis, medical departments in which these visits occurred, and medical diagnoses according to the International Classification of Diseases (ICD-8; National Center for Health Statistics, 1967) were compared to patients without a mental disorder. Results indicated that patients with a mental disorder made approximately 1 ½ to 2 times as many visits as the comparison group. This pattern of higher utilization was found across most medical services with the exception of visits to pediatric and obstetrical/gynecological services, where utilization rates were about equal for the two groups. Although the frequency of medical diagnosis in each ICD-8 category was higher for the mental disorder group, the only significant difference was found in the signs, symptoms, and ill-defined conditions category, suggesting that patients experiencing psychological distress often presented with vague complaints or symptoms that could not be linked directly to a specific pathogen. Similarly, when the sample was limited to children and adolescents (i.e., only those patients in the sample described above that were under 18 years of age), it was found that the mean number of visits for the mental disorder diagnosis group was higher than that of the no mental disorder diagnosis group across the four sites (two clinics and two health plans) in which the study was conducted (Jacobson et al., 1980). This finding held true across age and gender. Across sites, children and adolescents with a mental health diagnosis made from 1 ½ to approximately 5 ½ more visits during the year of study than those with no such diagnosis. However, it should be noted that in the clinics in which the greatest disparity was found, assessments for learning disabilities were conducted by non-psychiatric services, thereby inflating differences. Nevertheless, these findings suggest that psychological morbidity in adults and children alike is associated with increases in non-mental health care utilization.

Anxiety and Depression in Adults Anxiety and depression appear to be related to health care utilization. For example, Karlsson, Lehtinen, and Joukamaa (1995) found the prevalence of depression and anxiety to be significantly higher in frequent attenders of two Finnish primary care facilities than non-frequent attenders. Specifically, 24% of frequent attenders evidenced an affective disorder versus 2.3% of non-frequent attenders. Similarly, the prevalence rate for anxiety disorders among frequent attenders was 24%, whereas for non-frequent attenders the rate was 6.8%. Additionally, in an investigation of adults in the United States and West Germany, a dimensional measure of anxiety was found to predict likelihood to visit a physician for physical symptoms in both countries (Cockerham, Kunz, & Lueschen, 1988). Interestingly, however, when subjects were asked to consider physical symptoms in the abstract, anxiety level was inversely related to the perception that the symptoms required medical attention. That is, when given a list of physical symptoms, the more anxious subjects judged fewer symptoms as requiring medical attention. However, when experiencing actual physical distress, it was the highly anxious subjects who were more likely to seek medical attention. On the other hand, in this investigation, depression was found to be a significant predictor of whether an individual sought medical attention for experienced symptoms only in the West German sample. Similarly, Kellner, Hernandez, and Pathak (1992) investigated hypochondriacal fears and beliefs and somatization in groups of adult general practice patients and psychiatric outpatients. While the majority of general practice patients were presenting for care due to minor physical injuries, the psychiatric

patients had a variety of Axis I diagnoses including affective disorders (40%) and anxiety disorders (14%). The relevant instruments administered included the Illness Attitude Scales (Kellner, 1981) which consists of three scales (the hypochondriacal beliefs scale, the hypochondriasis scale, and the disease phobia scale), the Whitley Index (Pillowsky & Spence, 1981) which measures fear of disease and disease conviction, and the Symptom Checklist - 90 (SCL-90; Derogatis, Lipman, & Covy, 1973) which contains a somatization scale as well as an anxiety and depression scale. Separate stepwise multiple regression analyses were conducted to predict each measure of hypochondriasis. Predictor variables included the anxiety and depression scales from the SCL-90. While level of anxiety was a significant predictor for all indicators of hypochondriasis, depression was not a significant predictor in any of the analyses.

Similarly, Nayan (1989) administered a translation of the Hospital Anxiety Depression Scale (HAD; Zigmond & Snaith, 1983) to a sample of 20 Asian psychiatric patients. The HAD consists of two subscales (anxiety and depression). Since the HAD was developed for use with physically ill patients it minimizes use of somatic symptoms in determining anxiety and depression scores. Subjects were also given the Clinical Interview Schedule (CIS; Goldberg et al., 1970, as cited in Nayani, 1989). The CIS evaluates anxiety, depression, and somatic symptomatology. Correlation coefficients revealed a significant positive relationship between the anxiety scales from both the HAD and the CIS and the somatic scale of the CIS. Depression, measured by both the CIS and the HAD, was not significantly correlated with patient reports of somatic symptoms. Although hypochondriacal beliefs, somatization, and number of physical complaints may not directly correspond with physician utilization, together these studies suggest a link between perception of physical illness, disproportionate health care utilization, and anxiety. Moreover, Katon et al. (1990) found somatization to be positively related to use of medical services. He found that frequent users had elevated scores on the somatization scale of the SCL-90-R. Furthermore, anxiety and depression were also above normal in the high utilizers studied by Katon and his colleagues. In sum, these investigations provide some evidence of the relationship between anxiety and increased medical care utilization; however, they show less support for the association between depression and medical care usage.

Nonetheless, other research provides compelling evidence for a causal role of depressive symptomatology in increased medical care utilization. For example, Widmer and Codone (1978) examined utilization patterns of depressed adult patients in a family practice. In a particularly elegant design they were able to compare the behavior of patients diagnosed with an affective disorder during development of the depression (the seven months prior to the date on which the diagnosis was made: Period 2) both to themselves previous to the diagnosis of depression (examining a seven month period 19 months prior to the date on which the diagnosis of depression was made: Period 1) and to a group of non-depressed patients from the same practice examined during the same time periods. A significantly greater number of depressed patients initiated an office visit during the seven months just prior to receiving a diagnosis of depression. Specifically, 88% of the depressed group made at least one office visit during Period 1, whereas 59% of the control patients initiated a visit during this time. Moreover, the number of visits per patient in the depressed group increased significantly between Period 1 and Period 2 but no such change was found for the control group. In fact, 16% of patients in the depressed group made six or more visits during Period 2. In contrast, only 4% of the control group initiated as many visits

in the same time period. Furthermore, the increase in multiple visits in the depressed group could not be attributed to a general tendency for help-seeking, as evidenced by the fact that during Period 1 the depressed group was more similar in this regard to the control group (4% of the depressed patients initiated 6 or more office visits during Period 1) than to themselves at Period 2.

Anxiety and Depression in Children Research investigating the specific psychological factors associated with high medical health care utilization in children and adolescents is scarce. This is surprising given that one begins to learn health behaviors in childhood (Sallis & Nader, 1988; Wilkinson, 1988). Furthermore, clear-cut relationships have yet to emerge, with findings often contradicting each other or leading to complex interpretations.

The Ontario Child Health Study investigated the likelihood of psychologically disturbed children between the ages of four and 16 years to have used any type of ambulatory medical care (i.e., emergency room, physician's office, hospital outpatient department or clinic) during a six month period (Offord et al., 1987). Results suggested that psychologically disturbed and non-disturbed children were equally likely to have received ambulatory medical attention. However, the disturbed group included children with Conduct Disorder, hyperactivity and somatization as well as children with emotional disorders. Therefore, even if one or more of these classes of disorders were associated with a greater probability to seek medical care, the effect could be masked by the absence of a relationship or an inverse relationship of the other disorders with medical care utilization. Further, no distinction was made between children who were seen for one visit and children who were seen for multiple visits. Thus, rate of utilization could not be addressed in this study.

On the other hand, Riley et al (1993) investigated the relation between anxiety and depression and rate of health care utilization and found that anxiety and depression were predictive of frequency of attendance within a health maintenance organization (HMO). Specifically, Riley and her colleagues examined frequency of medical visits made within the HMO by 450 boys and girls between the ages of five and 11. Correlations revealed significant positive relationships between both anxiety and depression, as measured by the Health Status Questionnaire (Riley et al., 1993) completed by the participants' mothers, and number of medical visits made by the children. Moreover, when children were dichotomized into a high use or low use group, clinical scores on the anxiety and depressive scales were correlated with group membership, such that children rated as being in the clinical range of anxiety and depression were more likely to be in the high use group. Multiple regression analyses were conducted examining variables first within each of four components under study (i.e., child health variables, child mental health variables, maternal health care utilization and mental health, and family structure and functioning) and then variables that emerged as significant predictors within each of the components were examined across components. Within the child mental health component both anxiety and depression emerged as significant predictors of frequency of health care utilization. However, while high anxiety scores continued to predict higher number of medical visits as in the bivariate correlations, the nature of the relationship between depression and number of visits changed such that higher depression scores predicted lower volume of use. Further, in the across component analysis, anxiety no longer emerged as a significant predictor of number of visits whereas depression remained in the model. Again an inverse relationship between depression and medical visits was evident.

Similarly, in her investigation of psychosocial factors affecting physician utilization Bonner (1996) found that parents' perceptions of their child's internalizing behaviors (anxiety, depression and somatic complaints) were positively correlated with physician utilization. However, when internalizing scores were examined simultaneously with demographic factors, family factors, developmental factors and other child mental health variables (e.g., fears and somatization), an inverse relationship emerged between internalizing scores and frequency of physician utilization. Thus, the complex relationship between internalizing behaviors, including anxiety and depression, and physician utilization remains unclear. It appears that anxiety and/or depression may interact with some other variable(s) to reverse the positive relationship between the bivariate relations. However, given reliance on parental reports of anxiety and depression in these studies, it is questionable whether the relationships observed are indicative of the relationship between childhood anxiety and depression and physician utilization *parental perception* of childhood anxiety and depression and physician utilization. Although Bonner (1996) did not include a child-report of anxiety in her study, she did include the child's self-reported depression scores in her analysis. Interestingly, these scores were not significant predictors of physician utilization. However, little evidence exists to either support or to refute this finding. In fact, one investigation that did employ child reports, suggests that there was a trend for children reporting more psychological symptoms to be higher users of medical care (Diaz et al., 1986). However, the authors note that statistical significance was not achieved. Therefore, the present state of the literature suggests that a relationship may exist between childhood anxiety and depression and children's use of medical services; however, it is unclear whether these relationships are a result of the manifestation of the child's pathology in physical symptoms or some other phenomenon directly related to the child's internalizing symptomatology, or if the relevant variable is others' interpretations of and reactions to the child's behavior. In fact, Costello and her colleagues (Costello et al., 1988b) found increased medical care utilization associated with an emotional disturbance identified by the physician and not with an emotional disturbance per se. Therefore, she suggests that observed trends in high utilization for mental health help seekers may be due to the role of the primary physician as a gatekeeper to mental health services rather than to a true association between medical health care visits and psychological morbidity. However, given the paucity of studies in this area it is too early to definitively make such a conclusion.

In summary, as in the adult literature, there is evidence to suggest a relationship between anxiety or the perception of anxiety and physician utilization. Depression or the perceptions of depression also appears to play a role in explaining frequency of medical utilization. However, the relationship between depression and health care utilization appears to be a complex one.

Negative Affectivity. One reason for the ambiguous relationship between anxiety, depression and health care utilization may be that when anxiety and depression are considered together as predictors of physician visits, the relationship between anxiety and utilization may mask the relationship between depression and utilization. Evidence suggests that anxiety and depression are related in that they share a common component -- recently labeled negative affectivity (Clark & Watson, 1991; Watson & Clark, 1984; Wolfe et al., 1987). Further, negative affectivity and more generally, negative moods, have been found to correlate with measures of symptom reporting and health complaints (Watson & Pennebaker, 1989; Wertlieb, Weigel, & Feldstein, 1988). In addition to high levels of negative affectivity, anxiety is also characterized by

physiological arousal; however, these physical symptoms do not typify affective disorders (Clark & Watson, 1991). Clearly, physical symptoms that are inherent in definitions of anxiety and its disorders (APA, 1994) may augment the relationship between the negative affectivity component of anxiety (shared with depression) and medical care help-seeking; whereas the relationship between depression and health care utilization may depend solely on the relationship between depression and negative affectivity (shared with anxiety). Therefore, while the predictive contributions of depression and anxiety may rest predominantly with the shared variance between them (i.e., the negative affectivity component), many regression procedures would attribute this relationship to anxiety. Conversely, if the negative affectivity component of depression is essentially "noise", that is, if it is the construct of depression independent of negative affectivity (i.e., low positive affectivity) that contributes to high health care utilization rates, then regression analyses including indicators of negative affectivity and depression may be responsible for altering the bivariate relationship between depression and health care utilization. Therefore, it is important to clarify whether the relations observed between anxiety, depression, and health care utilization are solely attributable to the negative affectivity component of the constructs or whether unique components of anxiety and depression contribute meaningfully as well.

Family and Parental Factors

Young children's health behaviors, such as health care utilization, can reflect parents' behaviors and beliefs in two ways. First, oftentimes illness behavior may be ~~directly~~ directly linked to parental behavior since, with the exception of school sick room visits, help-seeking is typically initiated by parents. However, Tinsley (1992) asserts parental health behaviors influence a child's health behavior even when children begin to make their own health-care decisions, thus suggesting that parental health beliefs and behaviors affect child behavior ~~indirectly~~ indirectly through transfer of beliefs and knowledge to the child that in turn results in behaviors initiated by the child. Much of the research investigating these relationships has focused on the mother's role in determining health care utilization and imparting health related knowledge and beliefs, since it has traditionally been the mother's role to make and model health-care decisions for children. However, some studies have included more global measures of family functioning, although these too have typically been measured from the mother's perspective.

As discussed above, SES is one of the most consistent family factors found to be associated with health care utilization. Generally, low SES and the factors associated with low SES (e.g., high stress, low support) are related to low levels of health care utilization despite the fact that these same factors are related to high physical morbidity (Tinsley, 1992). Although little data are available to indicate why this is so, Mechanic (1964) finding that mothers with little education are more likely than well-educated mothers to report a fatalistic attitude toward their children's health suggests a causative link between SES and health care behavior. That is, it may be that mothers who believe there is little they can do to alter their child's health status have little motivation to engage in what are typically viewed as health-engendering behaviors such as regular physician visits. However, in this same investigation Mechanic indicated that the differential beliefs were not linked to differences in behavior. Given that there is a paucity of research investigating how SES and health behaviors are related, it is difficult to determine if this is a reliable finding; however, as in many areas of investigation, the link between SES and health behaviors seems to be a relatively consistent one.

In addition to economic factors, several aspects of family functioning have been examined in terms of their relationship to health care utilization. For example, the role of family conflict (Bonner, 1996; Riley et al., 1993) and expressiveness, cohesion, and organization (Bonner, 1996) in predicting health care utilization has been explored, with family conflict emerging as a significant predictor of children's health care use. Further, maternal psychopathology and health behaviors have been related to rate of child physician utilization. For example, mothers' rate of health care utilization is positively related to their children's use of health services (Mechanic, 1964; Riley et al., 1993) as is maternal psychological distress (Riley et al., 1993). Specifically, in a longitudinal investigation in England, Wolkin (1985) found that children of depressed mothers made more frequent visits to their general practitioners than did children of non-depressed mothers. Moreover, when Mechanic (1964) measured mothers' illness attitudes, children's illness attitudes (such as the child's attentiveness to his/her own symptoms), and children's health behaviors (such as use of medical services) simultaneously, he found that little of the variance in children's attitudes was accounted for by the mothers' illness attitudes, thus suggesting that parental attitudes may exert much of their influence through direct rather than indirect means.

Summary and Hypotheses

In conclusion, in the adult literature several classes of variables aside from actual physical health status have been suggested to contribute to high attendance in primary care facilities. Among these are demographic variables, such as sex and SES, and mental health variables such as anxiety and depression. Similarly, these same factors appear to affect children's health care utilization. In addition though, children's attendance at medical facilities appears to be related to parental and family factors as well. Although information about child psychopathology has helped to increase the predictive ability of models relating psychosocial variables and health care utilization it remains unclear as to why these variables are related. For instance, studies investigating the effects of children's anxiety and depression on medical utilization rates have typically used parent reports of anxiety and depression. Given that we know parents most often initiate medical visits for their children, it is unclear whether parental perception of the child's anxiety and depression results in the parent's seeking out of medical attention or whether anxiety and depression in children itself results in increased reliance on medical treatment. Thus, one of the major aims of the present investigation was to explore this relationship between anxiety and depression as perceived by the child him/herself and health care utilization. Moreover, it was hypothesized that children's self-reported levels of anxiety and depression would explain health care utilization rates above and beyond that explained by family factors such as family conflict that have been demonstrated to be associated with medical visits. Additionally, since maternal psychological distress and high medical utilization by mothers has been associated with increased medical visits in children, and anxiety and depression have specifically been implicated as factors leading to high health care utilization for adults for themselves, variables such as parental somatization, anxiety and depression were explored as explanations of children's health care use. Again, although it was predicted that parental factors would make significant contributions to explaining the number of physician visits made by children it was hypothesized that, as appears to be the case with adults, children's anxiety and depression levels would contribute meaningfully beyond their associations with parental psychopathology.

Another major purpose of the study was to explore the role of negative affectivity in explaining health care visits and to determine whether negative affectivity is solely or partially responsible for the relationships observed between anxiety and depression and health care utilization. Finally, although specific demographic factors such as age (due to the possibility that different health care needs may be evident at different ages) and gender are explored in the model under investigation, global factors such as SES, although found to co-vary with medical visits, are not included. For the reason that the primary purpose of this investigation was to explain variation in health care utilization rather than to simply predict number of visits, SES was not viewed as a useful, explanatory construct. Although research suggests SES may contribute substantial predictive power, the myriad of factors subsumed under SES and correlated with SES makes it difficult to interpret such a relationship meaningfully.

Thus, the following questions were explored: 1) Do demographic variables (age and sex) contribute to health care utilization rates in children/adolescents as they appear to do in adults? 2) Do parental and family variables (family conflict, parental somatization, parental anxiety and parental depression) increase explanatory power beyond that of simple demographic data? 3) Does negative affectivity add to such a model? and 4) Given that negative affectivity is already accounted for in the model do unique aspects of anxiety (physiological arousal) and depression (anhedonia) contribute meaningfully?

Methods

Participants

Twenty-four children/adolescents and their parents served as participants. Children ranged in age from 8 to 14 with a mean age of 11.04 years ($SD = 1.76$). Nine boys (37.5%) and 15 girls (62.5%) participated. For each child who participated in the study either one parent or both parents also participated. The majority of children were Caucasian (83%), with 8% of Hispanic, 4% of Caucasian-Chinese, and 4% of Korean American descent. In the majority of cases (70.8%) the participating parent was the mother, in 8.3% of cases the participating parent was the father, and, in 20.8% of cases, both parents participated. The sample was comprised of predominantly upper middle-class families, as evidenced by a mean Hollingshead rating (see Measures section) of 54.7.

Participants were recruited from two family practices, one in Blacksburg, Virginia and one in Christiansburg, Virginia, with the majority (92%) recruited from the Blacksburg practice. One subject recruited through the Blacksburg practice had switched physicians; therefore, medical utilization rate was obtained from the child's current physician.

Psychiatric diagnosis was assessed using the Anxiety Disorders Interview Schedule for the DSM-IV, parent and child versions (see Measures section). Diagnoses, according to both parent and child report, are shown in Table 1.

Each child and his/her parent(s) were evaluated according to procedures described below. Participants completed additional measures (e.g., Stroop Color Naming Task); however, these data were not collected for purposes of the present study, nor are these data included in the analyses undertaken. Therefore, these supplementary measures will not be discussed further.

Measures

The Anxiety Disorders Interview Schedule for DSM-IV- Child and Parent Versions. (ADIS-IV-C/P; Silverman, Albano, & Barlow, 1994) The ADIS-IV-C (child version) and ADIS-

IV-P (parent version) are semi-structured interviews designed to facilitate diagnosis of the anxiety and affective disorders and those disorders most commonly associated with them in children and adolescents between 6 and 17 years of age (Appendix A, Appendix B). Accordingly, sections covering school refusal, separation anxiety disorder, social phobia, generalized anxiety disorder, major depression, dysthymia, and attention deficit hyperactivity disorder are included in both the parent and child versions, as are screening questions for substance abuse. In addition, the parent interview allows for diagnosis of conduct disorder, sleep terror disorder, oppositional disorder, and enuresis.

Using an interviewer-observer paradigm, Silverman and Nelles (1988) found adequate clinician agreement for the original child version of the ADIS when diagnosing according to DSM-III categories (overall $\kappa = .84$ child interview alone, overall $\kappa = .83$ for parent interview alone, and overall $\kappa = .78$ for composite diagnosis). Recently, Silverman and Eisen (1992) have investigated the reliability of DSM-III-R anxiety diagnoses using the child ADIS. Using a test-retest paradigm with a 10-14 day interval their results indicated adequate reliability for an overall diagnosis of an anxiety disorder based on a composite of parent and child interviews ($.75$). More recently, Rapee, Barrett, Dadds, and Evans (1994) also investigated interrater reliability, as well as parent-child agreement on the ADIS. Again an overall kappa of $.75$ was found when both parent and child information was used to make diagnoses.

The current version of the ADIS, revised for use with the DSM-IV, was modified to allow for diagnosis of DSM-III-R anxiety disorders of childhood that have been subsumed under adult diagnoses in the DSM-IV (i.e., overanxious disorder and avoidant disorder). The items used to ascertain diagnoses for these categories in the previous version of the child ADIS were inserted directly into the modules into which they have been incorporated in the current version of the child ADIS. Diagnoses based on information from both the parent(s) and child informants are presented independently for purposes of describing the sample.

Child Depression Inventory (CDI; Kovacs, 1985). The CDI is a 27 item paper and pencil questionnaire (Appendix C). For each item, the child is presented with three statements representing varying levels of symptomatology. The child is asked to choose the statement that best describes him/her. Smucker, Craighead, Craighead, and Green (1986) found adequate reliability for the CDI for both boys and girls across several age groups (coefficient alphas ranging from $.83$ to $.89$). T-scores for the CDI total scale are used in analyses reported herein.

The Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1978). The RCMAS is a 37 item questionnaire (28 anxiety items, 9 lie items) in which children are asked to decide if each item is true or not true of them (Appendix D). Analysis has revealed a five factor structure: two lie factors, a physiological factor, a worry/oversensitivity factor, and a concentration factor (Reynolds & Paget, 1981). Using a sample of Caucasian and African-American boys and girls, Reynolds and Paget (1983) reported coefficient alphas ranging from $.78$ to $.85$. T-scores for the RCMAS total scale (which excludes lie items) are used in analyses reported herein.

The Positive and Negative Affect Schedule for Children (PANAS-C; Laurent, Potter, & Catanzaro, 1994) The PANAS-C is a developmentally scaled down version of the Positive and Negative Affect Schedule developed for adults by Watson, Clark and Tellegen (1988). The scale consists of 30 descriptors of mood (Appendix E). The subject is instructed to rate each item on a

five point scale to indicate how often he/she experiences the emotion described by the item. The PANAS-C can be used to assess both state and trait affect by varying the interval of time the subject is asked to consider. In the present study, participants were asked to rate their mood for the one month prior to their participation in this study. Laurent et al. (1994) reported an alpha coefficient of .91 for the Positive Affect scale and .88 for the Negative Affect Scale. Total scores on each scale are computed by adding the ratings for each item on the scale. Total scores on the Negative Affect scale are utilized here.

The Symptom Checklist - 90-R.(SCL-90-R; Derogatis, Lipman, & Covy, 1973). The SCL-90-R is a 90 item questionnaire that describes symptoms of general psychological distress (Appendix F). For each item the person is asked to rate severity over the past week. Responses are made on a five-point scale ranging from “not at all” to “extremely”. The SCL-90-R contains 10 symptom scales, including anxiety, depression, and somatization clusters as well as three global indices. Adequate internal consistency($\alpha = .90$) has been documented. T-scores for the anxiety, depression, and somatization scales are used in analyses reported herein.

Family Environment Survey(FES; Moos & Moos, 1981). The FES is a 90 item questionnaire (Appendix G). For each item the subject is required to decide if the statement is either true or false for his/her family. The FES contains ten subscales organized into three dimensions: 1)cohesion, expressiveness, and conflict(relationship dimension); 2)independence, achievement orientation, intellectual-cultural orientation, active-recreational orientation, and moral-religious emphasis(personal growth dimension); and 3)organization and control(system maintenance dimension) Test-retest reliability over an eight week interval ranged from .68 for independence to .86 for cohesion. Normative data are available for both normal and distressed families. Although the FES is available in both child and adult versions only the adult version, completed by both parents (whenever possible) were utilized in this study. Scaled scores on the FES conflict scale were used in analyses. The conflict scale measures the degree to which family members openly express anger, aggression and conflict. Moos and Moos (1981) report a two-month test-retest reliability of .85 for the conflict scale of the FES.

Physician Visit Record.(PVR; Goldberg, Roghman, McInerney, & Burke, 1984). The PVR is a two part form that is completed by the physician (Appendix H). The first section is completed for all visits and contains questions regarding general demographics, number of contacts, diagnoses and general emotional problems. The second part of the form is completed for subjects that the physician has judged to be mentally retarded, developmentally delayed, or to have an emotional problem. This section asks for more specific information, including physician’s judgment on degree of impairment and family response. Most relevant for purposes here, physicians were asked the number of visits the child had made during the year prior to his/her participation in the study.

The Four Factor Index of Social Status.(Hollingshead, 1975). The Four Factor Index allows for determination of social-economic-status based on sex, occupation, education and marital status (see Appendix I). Possible ratings range from a low of 8 to a high of 66.

Procedure

A list of patients between the ages of 8 and 14 was obtained from both family practices. In all, these lists included approximately 185 children and adolescents (however, in some cases two or more children from one family were represented in the list). An attempt was made to

contact the parents of each child on the list. Parents were first sent a letter from their child's physician briefly explaining the study and asking them to contact either the physician's office or the Child Study Center should they wish not to receive further information. If parents did not take either of these actions an attempt was made, either by the primary investigator or a research assistant, to contact the parents to describe the study in more detail and to solicit their participation. Whenever possible, both parents were encouraged to participate.

All interviews took place at the Child Study Center. Each appointment lasted approximately 1 ½ to 2 hours. The protocol included a semi-structured diagnostic interview administered to both the parent(s) and the child, and self-report questionnaires. Parents and their children were interviewed separately and simultaneously by two different interviewers.

Additionally, at the time of the interview parents were asked to sign a release of information form (see Appendix J for copies of release of information form and consent forms) granting permission for the child's physician to forward specific information to the researcher (i.e., the Physician Visit Record).

Results

In order to examine the central hypothesis, whether childhood anxiety and depression contributes to increases in physician visits, and to explore the role that the negative affectivity component of anxiety and depression plays in such a relationship, a hierarchical multiple linear regression analysis was performed. Hierarchical regression is a multivariate regression procedure in which the order of entry of the variables under consideration is determined a priori, on the basis of theoretical considerations, rather than empirical relationships between predictor variables and the criterion. In other words, variables are forced to enter the regression equation in an order specified by the researcher rather than according to data driven selection methods (e.g., increment in R^2). Such a procedure allows for the explanatory power of variables to be examined while controlling for related variables. This is done by forcing the variables one wishes to control for into the equation before other variables are allowed to enter. Thus, for example, forcing sex into the regression equation prior to allowing anxiety to enter, assures that the explanatory power attributed to anxiety is not due to the relationship between sex and anxiety.

In the present analysis variables were entered in four steps. First demographic variables were entered - sex and age. In the second step relevant parental and family factors were entered (i.e., SCL-90-R parental somatization scores, SCL-90-R parental anxiety scores¹, SCL-90-R parental depression scores, and level of family conflict as measured by the conflict scale of the FES). For each subject for which one parent participated the data provided by that parent was used to measure each of the parental and family constructs. In cases where both parents participated, only the mother's data was used in the present analysis. This decision was made on the basis that in two parent households child medical care is usually sought by the mother; therefore, it can be expected that maternal characteristics should be more related to utilization rates. In the third step, negative affectivity (i.e., the negative affectivity scale of the PANAS-C²)

¹ Data for one parent on the SCL-90-R anxiety scale was incomplete due to the parent's failure to complete one page of items on the questionnaire. Therefore, the parent's anxiety score was prorated.

² One participant failed to complete all items on the PANAS-C; therefore, the score was prorated.

was entered. Lastly, child self-reports of anxiety and depression (i.e., CDI and RCMAS³ scores) were entered. Thus, the explanatory power of negative affectivity, above and beyond that of sex, age and parental/familial variables was examined. Moreover the role of anxiety and depression independent of negative affectivity could be determined. Within each step variables were considered simultaneously since there was no compelling theoretical basis on which to prioritize their order of entry into the equation.

Means, standard deviations, ranges and zero-order correlations are presented in Table 2. As can be seen in Table 2, no significant bivariate relationships emerged between the demographic variables or parental variables and the number of physician visits made by the children. However, family conflict, and children's self-reports of anxiety and depression were significantly related to physician visits.

Results from the regression analysis using SAS version 6.1 (SAS Institute, 1995) are summarized in Table 3. Somewhat different results emerged when the variables were considered together in the regression model. Again, demographic variables contributed little to the explanation of physician visits. Neither age nor sex emerged as significant explanatory variables; taken together the demographic variables accounted for approximately 7% of the variance in the number of medical visits made by the children. However, when the parent/family variables were entered into the model, parental anxiety, parental depression and family conflict emerged as significant explanatory variables. Specifically, higher levels of parental depression was related to lower number of physician visits, whereas higher levels of parental anxiety was related to a greater number of physician visits. Similarly, higher levels of family conflict was related to higher number of physician visits. The addition of the parent/family variables provided a 54% increase in the variation in physician visits explained by the model, such that the complete model (i.e., all variables entered simultaneously) accounted for approximately 62% of the total variance observed. The addition of negative affectivity to the model did not increase the explanatory power of the complete model, adding less than 1% to the explained variance. Lastly, children's self-reports of anxiety and depression did not emerge as significant explanatory variables.

The standardized regression coefficients found in Table 3 allow for comparison of the relative contribution of each of the variables. As indicated by the standardized beta weights, parental depression figures most strongly in the standardized regression equation ($\beta = -.869$), followed by parental anxiety ($\beta = .667$), and family conflict ($\beta = .526$).

Discussion

Limitations

The size ($n = 24$) and characteristics of the sample employed in this study limit the conclusions that may be drawn from the results presented. For the most part, the sample is a highly homogeneous one. Most participants came from high SES backgrounds. Moreover, few evidenced significant internalizing symptomatology (as evidenced by the ADIS-IV/C+P diagnoses as well as self-report scores (mean RCMAS T-score = 36.08, mean CDI T-score = 43.00). More importantly, the variability and the range of health care utilization rates in the sample was severely restricted. The mean number of visits for this sample was 2.33, the range was from 0 to 10 visits. In the Riley et al. (1993) investigation, children with between 0 and 6 visits in two years were

³ One subject failed to complete several items on the RCMAS. Again, the total score was prorated.

considered low-utilizers, those with between 7 and 15 visits in two years were considered medium utilizers, and those with between 16 and 75 visits in two years were considered high-utilizers. Similarly Wertlieb et al. (1988) found that the mean number of physician contacts for the children in their study was around 4.5 contacts per year. Therefore, the majority of participants in this investigation could be considered low to average utilizers. Given these subject characteristics, it is impossible to make conclusions regarding the effects of clinical levels of anxiety and depression or to address the factors leading to over-reliance on medical care.

Another limitation of the present study pertains to the nature of the instruments used in the analyses. Although a diagnostic interview was administered to describe the sample, only self-report data were included in analyses. Additionally, the ability of the CDI (Kovacs, 1985) and RCMAS (Reynolds & Richmond, 1978) to measure the unique aspects of anxiety and depression is questionable. For instance, seven items on the CDI and RCMAS correspond with one another. In other words, 25% of items on the RCMAS are repeated on the CDI, and 26% of items on the CDI are repeated on RCMAS, thus bringing into question whether these instruments adequately assess the unique aspects of anxiety and depression that may be related to physician utilization.

Additionally, Mechanic (1980) suggests that one of the reasons psychological morbidity may affect indicators of physical health is that psychological morbidity may make one more attentive to physical symptoms and more willing to label bodily changes as problems. Further, some evidence suggests that it is psychological morbidity *interacting* with physical symptoms that may result in high rates of medical health care utilization (e.g., Cockerham, Kunz, & Lueshchen, 1988). However, no attempt was made here to gather information on degree of physical symptomatology. This may be an important consideration in future investigations.

Lastly, a major flaw in previous research has been to investigate medical utilization in individuals diagnosed with a psychological disorder or who were being seen for mental health treatment. Selecting samples in such a way ensures that all participants are help-seekers at least to the extent that they needed to consult with some health-care practitioner in order to receive a diagnosis or to become involved in treatment. Therefore, evidence of high medical health care utilization in these samples may be attributed to a general help-seeking tendency. Similarly, Mechanic (1983) suggests that studies focusing on only one source of assistance, such as physician utilization, are limited in the degree to which they can discern whether results are due to general-help seeking tendencies or are specifically related to medical utilization. Thus, the conclusions drawn from this investigation would have been stronger had data on additional measures of help-seeking been collected. Therefore, the implications discussed below should be considered in light of these limitations.

Implications and Future Directions

The current investigation examined the role of childhood anxiety and depression in explaining medical health care utilization, while concurrently accounting for the effects of demographic, parental and family variables and negative affectivity. Whereas, with few exceptions (e.g., Bonner, 1996; Diaz et al., 1986) previous research has considered parental perceptions of children's anxiety and depression, a major aim of this study was to examine the role of anxiety and depression as reported by children themselves. Additionally, given the oft-reported finding of the relationship between anxiety and depression in childhood (e.g., Nottelmann & Jensen, 1994, for a review) and the recent assertion that the observed relationships may be due in

part to the relationship of both anxiety and depression to negative affectivity (Clark & Watson, 1991; Watson & Clark, 1984) the role of negative affectivity in explaining health care utilization was examined. Moreover, the effects of negative affectivity on the relationships between anxiety and depression and physician utilization were investigated by statistically controlling for the effects of negative affectivity when considering anxiety and depression.

Children's age and sex did not contribute meaningfully to the variation observed in health care utilization. In fact, together these variables accounted for only 7% of the variance in number of physician visits. Such a result is surprising given findings in the adult literature (e.g., Berkanovic, Telesky, & Reeder, 1981) suggesting that women are consistently more likely than men to seek medical help. Therefore, the finding that sex did not significantly affect medical help-seeking is in itself a significant finding. Again, age, at least among the ages considered in the present sample (8-14 years) did not significantly explain child health care utilization. One possible explanation for these findings is that physician utilization may be primarily a reflection of parent behavior rather than child behavior. Such a contention is supported by the fact that the only variables to emerge as significant explanatory variables were the parent and family variables. Specifically, parent and family variables produced a 54% addition to the variance accounted for by the complete regression model. While level of family conflict and parental anxiety and depression were significantly related to children's medical care utilization, parental somatization failed to add meaningfully to the model. Where somatization has been shown to be related to adults' use of health care services for themselves (Katon et al., 1990) the findings from the present investigation suggest that parental somatization does not have a similar effect on either children's health care utilization or on parental utilization of health care for their children. This may appear at odds with the suggestion that children's health care utilization may actually be primarily a parental behavior. If parents tend to be sensitive to their own symptoms and to frame them in terms of somatic complaints, and if somatic complaints lead to medical consultation, it seems likely that this same process of somatization and medical health care seeking would occur in parents' interpretations of and reactions to their children's symptoms. However, this supposition is not borne out in the present investigation nor in much of the previous research. In fact, Tinsley (1992) argues that it is mothers' attitudes about their children's health and not mothers' health attitudes with respect to themselves that plays a role in maternal health behavior on the part of children. Similarly, Hickson and Clayton (1995) suggest that *parents' perceptions* of children's physical health and general well-being as well as *parental perceptions* of children's ability to cope with and tolerate illness affect the frequency of children's health care utilization above and beyond physical symptoms *per se*. While parental perceptions of and attitudes regarding their own health and that of their children may be related, the current findings suggest that the mechanism by which the two may be connected is mediated by parental anxiety and depression rather than parental somatization behavior. That is, it may be the tendency to be alert to signs of danger and to interpret stimuli as negative and threatening that is associated with anxiety, rather than the tendency to interpret signs and symptoms as physical problems, that accounts for the previous (Hankin et al., 1984; Mechanic, 1964) relationship obtained between parents use of medical services for themselves and for their children. Additionally, the hopelessness and lethargy associated with depression may cause parents to interpret their children's symptoms as beyond their control, resulting in the failure to consult with a health care practitioner.

Contrary to expectations, children's level of negative affectivity was not significantly related to physician utilization, either when considered in isolation (as indicated by the non-significant bivariate correlation between negative affectivity and physician visits) or when considered while controlling for demographic and parent/family variables (as reflected by its failure to emerge in the regression analysis). Similarly, children's levels of anxiety and depression did not explain medical utilization when their relationships with the other variables under consideration were controlled for. However, both anxiety and depression were significantly and positively correlated with number of physician visits (as indicated by the significant bivariate relationships). Given the weak relationships between child anxiety and depression and the significant variables in the regression model, it was somewhat surprising that the significance of the bivariate correlations was no longer evidenced in the regression analysis. One reason for this may be that anxiety and depression were considered simultaneously. In other words, each was considered as if the other were already in the model. Therefore, the shared variance between anxiety and depression was not attributed to either factor. This was done because recent theory suggests that this shared variance is attributable to negative affectivity (Clark & Watson, 1991) which was entered into the model before anxiety and depression, in effect partialling out the negative affectivity component out of each of the constructs. Therefore, when anxiety and depression were entered into the model with negative affectivity partialled out, these scores could be conceptualized as representing the unique aspects of anxiety (high physiological arousal) and depression (low positive affectivity). Since these factors are considered unique there should have been little shared variance to detract from the relationships tested in the regression analysis. However, even with negative affectivity scores partialled out, anxiety and depression continued to share a large proportion of variance. Thus, it may be that negative affectivity may not have been completely eliminated from the anxiety and depression scores. Therefore, when anxiety and depression were entered together the elimination of the variance they continued to share may have weakened the relationships observed in the bivariate correlations. In fact, if the regression analysis is done entering anxiety before depression, anxiety does emerge as a significant explanatory variable ($T = 2.56, p < .022, \beta = .561$), thus suggesting that medical utilization is not solely a reflection of parental behavior. However, even considered in this manner the explanatory power attributed to child anxiety is not as strong as that attributed to parental anxiety or parental depression. Reversing the order of entry of the variables so that depression enters first does not change the lack of relationship between depression and physician visits ($T = 1.84, p < .086, \beta = .363$). In summary, childhood anxiety may have an effect on physician visits beyond that explained by parental and family variables. However, it is unclear whether negative affectivity was controlled for to the extent that was intended or if the measure of anxiety employed adequately assessed the unique component of anxiety (high physiological arousal). Therefore, while this study suggests that the unique aspects of anxiety are relevant in explaining health care utilization, there is still some question regarding whether the observed relationship can better be accounted for by anxiety's relationship with negative affectivity. On the other hand, although this investigation suggests that childhood depression does not help explain rate of medical utilization, if negative affectivity is not related to physician utilization, the failure to adequately control for its effects may have masked a real relationship between depression and the tendency to initiate medical health care visits.

Identification of the specific factors responsible for children's over-reliance on medical health care is important in its own right, if psychological factors are responsible for children's rate of medical utilization, patients may not be receiving the best care unless physicians are educated about this relationship and sensitized to the implications. In fact, Mechanic (1983) suggests that physicians may seriously alter their definition of a patient based on the person's illness behavior. It is easy to see that high health care utilization, in the absence of medical problems, may frustrate physicians, causing them to discount their patient's concerns, thus making detection of psychological morbidity less likely rather than more likely. Moreover, high health care utilization has been related to other indicators of negative functioning. For example, children who are frequent attenders at the school sick room have been found to have lower academic achievement scores than their non-frequent attending counterparts (Joost et al., 1993). Furthermore, medical usage appears to be a stable behavior (Starfield et al., 1979; Wertlieb, Weigel, & Feldstein, 1988) with much of the stability accounted for by frequent attendance (Starfield, van den Berg, Steinwachs, Katz, & Horn, 1979). Therefore, it appears that the factors leading to frequent attendance are also stable and enduring difficulties. However, there are still many questions regarding the specific factors that lead one to become a frequent attender. The current investigation suggests that much of the variance in physician utilization by children can be accounted for by parent and family variables. Therefore, interventions with these children must clearly include parent and family involvement as a primary focus. Additionally, future investigations need to focus on the mechanisms by which parental psychological distress and family conflict lead to increased medical utilization on the part of children.

This investigation also suggests that child anxiety, independent of family and parent variables, may account for increased medical utilization. However, given the definition of medical utilization employed (physician visits), a behavior which is heavily dependent on parent's decisions, it is impossible to determine whether child anxiety affects children's behavior or whether parents are more likely to seek medical attention when they view their child as being highly vulnerable. Therefore, future investigations need to examine child psychological factors, namely anxiety, depression and negative affectivity, from the child's perspective, in environments that are less contaminated by direct parental influence (e.g., school sick rooms). In fact, Bonner (1996), has found that children's self-reports of depression are related to increased use of the school sick room. However, given the relationship between anxiety, depression and negative affectivity, these investigations may prove more useful in identifying the specific factors leading to medical help-seeking if these factors are considered concurrently.

Lastly, as discussed in more detail above, physician utilization may be an indicator of general help-seeking rather than a behavior specific to medical health care utilization. Such a possibility has several important implications. First, future investigations exploring factors related to medical health care utilization must include other indicators of help-seeking behavior (independent of the selection method used to recruit the sample). In this way, we can begin to look at whether anxiety, depression and negative affectivity lead to an increased or decreased willingness to seek help in general, or whether there are factors that lead some individuals with high levels of anxiety, depression and negative affectivity to interpret their symptoms as physical ailments. Secondly, determining the factors associated with help seeking behavior has broad implications for health research in general (Mechanic, 1983). If high levels of anxiety, depression

and negative affectivity are related to help-seeking, individuals with these characteristics are more likely to be included in any clinical sample. However, if these factors are associated with the tendency to seek help for other medical/psychological difficulties rather than with other types of physical and psychological morbidities themselves, research efforts are likely to support false associations. Importantly, in psychological research this may be affecting the way we have come to define many disorders.

Summary

In summary, the present investigation examined the effects of anxiety and depression on physician utilization while simultaneously controlling for and investigating the effects of parent/family variables, demographics, and negative affectivity. While results suggest that family and parent variables, and possibly child anxiety, contribute significantly to explanations of variability in normal rates of physician utilization, further research needs to be done to clearly define the role of these variables in over-reliance on medical care. Furthermore, the role played by each of the specific components of anxiety and depression versus the common component of negative affectivity in determining the relationship between psychopathology and physician utilization needs to be more clearly explicated. Such refinements in health care utilization research are necessary in order to identify the specific mechanisms by which psychological morbidity and health care utilization are related.

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Table 1
Psychiatric Diagnoses on the ADIS-IV/ C and ADIS-IV/P

	<u>Child Informant</u>	<u>Parent Informant</u>
Separation Anxiety Disorder	1	0
Specific Phobia	3	2
Generalized Anxiety Disorder	0	2
Attention Deficit/Hyperactivity Disorder -Predominantly combined subtype	0	4
Attention Deficit/Hyperactivity Disorder -Predominantly inattentive subtype	0	2
Oppositional Defiant Disorder	NA*	2

* Not included in the child interview

Table 2

Zero-Order Correlations, Means, and Standard Deviations for Predictor Variables and Physician Visits

	Sex [†]	Age	P-Som	P-Anx	P-Dep	Con	NA	C-Dep	C-Anx	PV
Sex [†]	-	.319	-.428*	-.320	-.108	.093	-.026	-.363	-.140	-.256
Age		-	-.652**	-.623**	-.655**	.137	-.170	-.244	.203	-.148
P-Som			-	.637**	.598**	-.023	.022	.125	-.014	-.056
P-Anx				-	.837**	-.018	-.070	.152	-.255	.091
P-Dep					-	-.049	-.041	-.071	-.389	-.177
Con						-	.338	.165	.305	.469*
NA							-	.465*	.612**	.289
C-Dep								-	.572**	.611**
C-Anx									-	.467*
PV										-
M	.625	11.042	47.208	48.792	52.167	47.000	23.750	43.000	36.083	2.33
S.D.	.495	1.756	7.413	7.102	8.509	8.464	7.691	7.512	7.077	2.057
Range	0-1	8-14	41-67	42-74	42-75	32-65	16-40	35-71	27-54	0-10

[†] Male = 0, Female = 1

(P-Som = parental somatization, P-Anx = parental anxiety, P-Dep = parental depression, Con = family conflict, NA = child negative affectivity, C-Dep = child depression, C-Anx = child anxiety, PV = number of physician visits)

* p < .05

** p < .01

Table 3
Hierarchical Regression Analysis for Physician Visits

Variable	B*	Standardized B*	T	p<	Total R ^{2†}
Age	-.087	-.074	-0.33	.742	.071
Sex [†]	-.968	-.233	-1.05	.306	
P-Som	-.112	-.402	-1.78	.094	.615
P-Anx	.193	.667	2.17	.045	
P-Dep	-.210	-.869	-2.74	.014	.616
Con	.128	.526	3.42	.003	
NA	.010	.036	0.20	.844	.746
C-Dep	.049	.180	0.86	.405	
C-Anx	.133	.457	1.82	.091	

[†] Male = 0, Female = 1

(P-Som = parental somatization, P-Anx = parental anxiety, P-Dep = parental depression, Con = family conflict, NA = child negative affectivity, C-Dep = child depression, C-Anx = child anxiety, PV = number of physician visits)

* Regression coefficients are presented in a hierarchical fashion, such that each coefficient reflects the effects of each variable while controlling for all other variables examined in the same or prior steps.

^{††} Values for R² are expressed in a non-hierarchical manner, such that these values reflect the total variance explained with all variables up to and included in the step under consideration entered simultaneously.

Appendix A
Anxiety Disorders Interview Schedule for DSM-IV - Child Version

Copyrighted Material
Available from:
Graywind Publications
Stuyvesant Plaza
Executive Park Drive
Albany, New York 12203

Appendix B
Anxiety Disorders Interview Schedule for DSM-IV- Parent Version

Copyrighted Material
Available from:
Graywind Publications
Stuyvesant Plaza
Executive Park Drive
Albany, New York 12203

Appendix C
Child Depression Inventory

Copyrighted Material
Available from:
Multi-Health Systems Inc.
908 Niagara Falls Boulevard
North Tonawanda, New York 14120-2060

Appendix D
Revised Children's Manifest Anxiety Scale

Copyrighted Material
Available from:
Western Psychological Services
Publisher and Distributors
12031 Wilshire Boulevard
Los Angeles, California 90025-1251

Appendix E
Positive and Negative Affect Schedule for Children

Subj # _____

Feelings and Emotions (PANAS-C)

This scale consists of a number of words that describe different feelings and emotions. Read each item and then circle the appropriate answer next to that word.

Indicate to what extent you have felt this way during the past month.

	Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
Interested	1	2	3	4	5
Sad	1	2	3	4	5
Frightened	1	2	3	4	5
Alert	1	2	3	4	5
Excited	1	2	3	4	5
Ashamed	1	2	3	4	5
Upset	1	2	3	4	5
Happy	1	2	3	4	5
Strong	1	2	3	4	5
Nervous	1	2	3	4	5
Guilty	1	2	3	4	5
Energetic	1	2	3	4	5
Scared	1	2	3	4	5
Calm	1	2	3	4	5
Miserable	1	2	3	4	5
Jittery	1	2	3	4	5
Cheerful	1	2	3	4	5
Active	1	2	3	4	5
Proud	1	2	3	4	5

Afraid	1	2	3	4	5
Joyful	1	2	3	4	5
Lonely	1	2	3	4	5
Mad	1	2	3	4	5
Fearless	1	2	3	4	5
Disgusted	1	2	3	4	5
Delighted	1	2	3	4	5
Blue	1	2	3	4	5
Daring	1	2	3	4	5
Gloomy	1	2	3	4	5
Lively	1	2	3	4	5

Appendix F
Symptom Checklist- 90 -Revised

Copyrighted Material
Available From:
National Computer Systems Inc.
P.O. Box 1416
Minneapolis, Minnesota 55440

Appendix G
Family Environment Survey

Copyrighted Material
Available From:
Consulting Psychologists Press Inc.
577 College Avenue
Palo Alto, California 94306

Appendix H
Physician Visit Record

PHYSICIAN VISIT RECORD

Patient's Name (last, first, middle)

Subj#

1. Date of last visit ____ - ____ - ____

2. How many times have you seen this patient in the last year?

3. Current medical diagnostic impressions for most recent visit. (If no diagnosis is made, please specify)

1st DX _____

2nd DX _____

4. In your opinion, has this patient any mental retardation or developmental delay?
(Check all that apply)

1 ___ no 2 ___ yes, mental retardation
3 ___ yes, other delay (specify) _____

5. In your opinion, has this patient EVER had a behavioral, emotional or school problem from which he or she has recovered?

1 ___ no 2 ___ yes, recovered 3 ___ Don't know

6. In your opinion, does this patient CURRENTLY have a behavioral, emotional, or school problem, treated or untreated?

1 ___ no 2 ___ yes 3 ___ Don't know

7. Does this patient appear to be depressed to you? Yes/No
Does this patient appear to be anxious to you? Yes/No

Continue only if you answered yes to question 4, 5, 6, or 7

8. Please classify the patient's problems according to the following categories.
CHECK ALL THAT APPLY

- Specific developmental disorder:
 - 1.ADHD 1 ___
 - 2.Speech & language disorder 2 ___
 - 3.Other specific learning disorder 3 ___
 - 4.Enuresis (as isolated disorder) 4 ___
 - 5.Encopresis (as isolated disorder) 5 ___
 - 6.Tics 6 ___
 - 7.Stuttering 7 ___
- 8.Oppositional disorder 8 ___
- 9.Conduct disorder 9 ___
- 10.Depressive disorder 10 ___
- 11.Anxiety disorder 11 ___
- 12.Psychosis 12 ___
- 13.Personality disorder 13 ___
- 14.Psychosomatic disorder 14 ___
- Other clinical syndrome:
 - 15.Anorexia Nervosa 15 ___
 - 16.Bulimia 16 ___
 - 17.Other 17 ___
- 18.Mental retardation 18 ___

9. How much do you feel this patient's problems impair:

..... his or her functioning?		
..... his or her family's functioning?		(check one in each column)
	Patient	Family
Severe degree	_____	_____
Moderate degree	_____	_____
Minor degree	_____	_____
No functional impairment	_____	_____

Appendix I
Four Factor Index of Social Status

Available from:
August B. Hollingshead
Department of Sociology
Yale University
P. O. box 1965
New Haven, Connecticut 06520

Appendix J
Release of Information Form
Parent Consent Form
Child Assent Form
Physician Consent Form

Release of Information

I _____ agree to allow project staff, under the
Print your name here
direction of Laura Seligman and Dr. Thomas Ollendick, to contact _____ 's
Print child's name here
physician. Specifically, I give permission for my child's physician to complete the Physician Visit Record. The information that will be requested has been explained to me and I understand that this information will be kept confidential and will be released to no one except qualified project staff.

Physician's Name

Parent's Signature

Child's Signature

Date

Official Parent Consent Form

Title of Experiment: Anxiety and depression in normal children and adolescents.

Experiment Number: 1046-95

Purpose of the Study

The purpose of this study is to investigate the nature of anxiety and depression that normal children and adolescents may experience and how this changes as children grow older. In addition, we are interested in looking at how these experiences affect children and adolescents.

Procedures

You and your child will complete an assessment that will take place in one session lasting approximately 2-2 1/2 hours.

Specifically, your child's involvement in the project will include 1) completing an interview in which s/he will be asked questions about his/her experiences with sadness, anxiety, and attention difficulties, 2) completing several questionnaires dealing with the thoughts and feelings some people have when they are feeling anxious or sad, 3) performing a computerized task in which s/he will view a series of words printed in different colors and will be asked to name the color of the words, and 4) answering some questions given by the interviewer about the relationship between two or more concepts and reading aloud several words presented by the interviewer.

Parents' participation will include 1) completing an interview where you will be asked about any difficulties you have noticed with your child, and 2) completing several questionnaires telling us what your family is like, how your child behaves and any concerns you have about anxiety or depression.

In addition, we will be asking you to sign a form giving us permission to obtain records from your child's school telling us about his/her grades, achievement test scores, and attendance records. We will also be asking you to allow us to have your child's teacher complete a questionnaire regarding his/her behavior in school. Further, we would like to obtain general background information from your child's doctor regarding number of visits made this past year and general medical history.

Finally, with your permission, we will be contacting you annually over the next several years (until your child graduates from high school) to update all of the above information. We would like to do this so we can study these issues over time. If we fail to contact you, you may contact either the Department of Psychology at 231-6581, or the Psychological Services Center at 231-6914 for information about the project or your continued participation. Dr. Ollendick and his graduate students will coordinate this follow-up.

Discomforts/Risks from participating in this study

There is the possibility that you or your child may become uncomfortable or embarrassed about answering some questions; however, you have the option to discontinue your participation at any time. Further, a graduate student trained in clinical psychology will be available throughout the study in case you have any questions. Dr. Ollendick, faculty supervisor, will also be available for this purpose.

Expected Benefits

Your participation will help us to understand the types of experiences children and adolescents have when they are anxious and depressed. In addition, you will be receiving written feedback about the results of our assessment. Additionally, if you choose, this information will be shared with your physician; however, no information will be released without your consent. You will also receive five dollars to compensate you for your time and, with your permission, your child will receive a coupon for use at a local business

Freedom to Withdraw

You are free to withdraw from participation in this study at any time, without penalty. You have the option to not answer any question(s) at any time during the study.

Anonymity of Subjects and Confidentiality of Results

The results of this study will be kept strictly confidential. Researchers will not release your results to anyone without your written consent except in the case where you have indicated that you may hurt yourself or someone else or your child has indicated that he/she may hurt him/herself or someone else. The information you provide will have your name removed and only a subject number will identify you during analyses and any write-up of the research.

The interviews will be audio-taped so that we can have another member of our project staff review the audio tapes for accuracy of recording. Only qualified project staff (graduate and undergraduate psychology students) will listen to these tapes. If any member of the project staff knows your family they will not be permitted to listen to these tapes. They will be erased following this accuracy check, certainly within one year.

Use of Research Data

The information from this research may be used for scientific or educational purposes. It may be presented at scientific meetings and/or published and reproduced in professional journals or books, or used for any other purpose that Virginia Tech's Department of Psychology considers proper in the interest of education, knowledge, or research.

Approval of Research

This research project has been approved by the Human Subjects Committee (HSC) of the Department of Psychology and by the Institutional Review Board (IRB) of Virginia Tech, as is required of all research projects conducted at Virginia Tech.

Subjects' Permission

I have read the above description of the study. I have had an opportunity to ask questions and have had them answered. I hereby acknowledge the above and give my voluntary consent for participation in this study.

I further understand that if I participate I may withdraw at any time without penalty.

I understand that should I have any questions regarding this research and its conduct, I should contact any of the persons named below.

Laura D. Seligman, Principal Investigator	231-6914
Dr. Thomas H. Ollendick, Faculty Advisor	231-6451
Dr. Richard Eisler, Chair, Human Subjects Committee	231-7001
Dr. Ernest Stout, Chair, Institutional Review Board	231-9359

Parent's Name (Printed)

Parent's Signature

Date

ID Number

Child Assent Form

Title of Experiment: Anxiety and depression in normal children and adolescents.
Experiment Number: 1046-95

You have been chosen to take part in a study about how normal children and adolescents experience different types of feelings. If you agree to be in the study, you will complete an interview and answer several questionnaires about your feelings and some problems (such as being sad, fearful, or nervous) you may be having. In addition, you will be asked to read some words aloud, some of which have to do with how people feel when they are upset, nervous, or fidgety. You will also be asked to tell how two concepts are the same. All of this should take you about 2 - 2 1/2 hours. Your parent(s) will also be giving us information about you, themselves and your family. If you agree, we will contact you once a year, until you graduate from high school, to update this information. All of your answers will be kept confidential unless we think that you may hurt yourself or someone else or if we believe that someone is hurting you. Except for these times, your answers will only be told to the people working on the study.

If you have any questions or if anything upsets you, you may talk with ~~me~~ I will answer any questions you have. You can decide that you do not want to answer any questions. Even if you decide to be in the study, you may stop at any time if you do not wish to continue to participate. By choosing to be in the study, you will help us understand different feelings that children and adolescents have. If you have any questions after the study is finished, you may call Laura Seligman at 231-6914.

If you want to be in the study, please sign this form to let us know that you understand what the study is about, you know who to ask if you have any questions, and that you understand that you can stop at any time.

"I agree to be in the study."

Name

Date

Witness

Date

Official Physician Consent Form

Title of Experiment: Anxiety and depression in children and adolescents.

Experiment Number: 1046-95

Purpose of the Study

The purpose of this study is to investigate the nature of anxiety and depression that normal children and adolescents may experience and how this changes as children grow older. In addition, we are interested in looking at how children and adolescents are affected by these experiences. As noted in the attached parent and child forms, permission has been granted for us to obtain information from you.

Procedures

Your participation in the study will include completing a questionnaire providing information regarding the medical background of your patient.

Discomforts/Risks from participating in this study

There are no known or expected risks or discomforts associated with your completing these forms on your patient. You will only be asked to provide us details about your patients' medical history, and nothing about your practice or yourself.

Expected Benefits

Your participation will help us to understand the types of experiences children and adolescents have when they are anxious and depressed.

Freedom to Withdraw

You are free to withdraw from participation in this study at any time. You have the option to not answer any question(s) at any time during the study. If you choose not to complete these forms, simply forward them back to us in the enclosed envelope.

Anonymity of Subjects and Confidentiality of Results

The results of this study will be kept strictly confidential. Researchers will not release your results to anyone without your written consent; however, parents will be receiving general feedback as to the nature of any symptoms their child is experiencing. The information you provide will have your name removed and only a subject number identifying your patient will be used during analyses and any write-up of the research.

Use of Research Data

The information from this research may be used for scientific or educational purposes. It may be presented at scientific meetings and/or published and reproduced in professional journals or books, or used for any other purpose that Virginia Tech's Department of Psychology considers proper in the interest of education, knowledge, or research.

Approval of Research

This research project has been approved by the Human Subjects Committee (HSC) of the Department of Psychology and by the Institutional Review Board (IRB) of Virginia Tech, as is required of all research projects conducted at Virginia Tech.

Subjects' Permission

I have read the above description of the study. I have had an opportunity to ask questions and have had them answered. I hereby acknowledge the above and give my voluntary consent for participation in this study.

I further understand that if I participate I may withdraw at any time without penalty.

I understand that should I have any questions regarding this research and its conduct, I should contact any of the persons named below.

Laura D. Seligman, Principal Investigator	231-6914
Dr. Thomas H. Ollendick, Faculty Advisor	231-6451
Dr. Richard Eisler, Chair, Human Subjects Committee	231-7001
Dr. Ernest Stout, Chair, Institutional Review Board	231-9359

Physician's Name (Printed)

Physician's Signature

Date

ID Number

CURRICULUM VITAE

Laura D. Seligman

PERSONAL INFORMATION

Home Address

2805 Newton Court
Blacksburg, VA 24060
(540) 951-3249

Date of Birth: June 21, 1970
Social Security Number: 080-70-6073
E-mail address: Seligman@vt.edu

EDUCATION

Virginia Polytechnic Institute and State University, Blacksburg, VA.

- Currently enrolled in the Clinical Psychology Program
- Major Advisor: Thomas H. Ollendick, Ph.D.

State University of New York at Oneonta, Oneonta, NY.

- B.A., Major: Psychology; Minor: Statistics

PROFESSIONAL EXPERIENCE

1/91-5/91: Teaching Assistant: Department of Psychology, SUNY Oneonta

- assisted with an undergraduate course in experimental psychology

6/93-8/93: Teaching Assistant: Department of Psychology, SUNY Oneonta

- assisted with an advanced undergraduate course in statistics

8/93-5/94: Laboratory Instructor: Department of Psychology, Va. Tech

- instructor for four sections of an undergraduate Introductory Psychology laboratory

8/94-12/94 Teaching Assistant: Department of Psychology, Va. Tech

- assisted with undergraduate courses in personality theory and social psychology

1996 Journal Reviewer, Journal of Child Clinical Psychology

- reviewed manuscripts submitted for publication

CLINICAL EXPERIENCE

6/88-8/88 & 6/89-8/89: Rehabilitation Trainer: Hartwick Day Treatment Program, Hartwick, NY.

- assisted in implementation of behavioral goal plans for developmentally disabled/mentally retarded adults

8/93-5/94: Clinical Practicum: Psychological Services Center and Child Study Center, Va. Tech. Supervisors: George A. Clum, Ph.D. and Russell T. Jones, Ph.D.

- completed a 240 hour Clinical Practicum
- training included assessment/treatment of child and adult clients

8/94-5/95: Clinical Practicum: Psychological Services Center and Child Study Center, Va. Tech. Supervisors: Kerri Augusto, M.S. and Thomas H. Ollendick, Ph.D.

- completed a 480 hour Clinical Practicum
- training included assessment/treatment of child adult clients and co-leader of a weekly Social Phobia group

5/95-8/95: Graduate Clinician: Psychological Services Center and Child Study Center, Va. Tech. Supervisor: Richard M. Eisler, Ph.D.

- maintained a caseload of 10 clients including children, adults, and families

9/95-11/95: Graduate Clinician, Va. Tech. Supervisors: Sara G. Mattis, M.S. and Thomas H. Ollendick, Ph.D.

- co-leader of group for college students with panic attacks

5/96-7/96: Summer Extern, Anxiety Prevention and Treatment Research Center, Medical University of South Carolina Supervisors: Deborah Beidel, Ph.D. and Samuel Turner, Ph.D.

- group and individual therapist for children with social anxiety disorder

1/95-Present: Graduate Assistant: ADHD and Anxiety Assessment Clinic at the Child Study Center, Va. Tech. Supervisor: Thomas Ollendick, Ph.D.

- completed 5-6 assessments per semester with children/adolescents and their families
- assisted in administrative duties

RESEARCH EXPERIENCE

1/94-4/95: Research Assistant, Va. Tech

- administered diagnostic and family history interviews to women with a childhood history of sexual abuse

11/95-1/96: Research Assistant, Va. Tech

- assisted in data analysis

PROFESSIONAL PRESENTATIONS

Seligman, L. D., Goza, A. B., Byrd, D. A., & Ollendick, T. H. (1996, November). An examination of the tripartite model of anxiety and depression in children and adolescents. Association for the Advancement of Behavior Therapy, Washington, DC.

Seligman, L. D., Butcher, A. T. & Ollendick, T. H. (1996, October). The effects of comorbid anxiety on delinquency in children with severe conduct disorder. Commonwealth Institute for Child and Family Studies, Virginia Beach, VA.

Seligman, L. D., Butcher, A. T., Ollendick, T. H. (1995, November). Relationship among anxiety, depression, and conduct disturbance in incarcerated delinquents: A test of Gray's Theory. Association for the Advancement of Behavior Therapy, Washington, DC.

Byrd, D. A., Goza, A. B., Seligman, L. D., & Ollendick, T. H. (1995, September). Anxiety and depression in youth: A cognitive analysis. Commonwealth Institute for Child and Family Studies, Virginia Beach, VA.

Goza, A. B, Seligman, L. D., Byrd, D. A., & Ollendick, T. H. (1995, September). Anxiety and depression in children and adolescents: An examination of the tripartite model. Commonwealth Institute for Child and Family Studies, Virginia Beach, VA.

Seligman, L. D., & Ollendick, T. H. (1995, September). Mixed Anxiety Depression in children and adolescents: The validity of a proposed diagnostic category. Commonwealth Institute for Child and Family Studies, Virginia Beach, VA.

Ingman, K.A., Seligman, L.D., Ollendick, T.H., & Akande, D. (1994, November). Cross-cultural aspects of fear in African children and adolescents. Association for the Advancement of Behavior Therapy, San Diego, CA.

Guzy, L.T., Levinson, J., Yahiel, Y., Seligman, L.D., & VanZandt, S. (1993, October). The seriousness of the sun phantom in passing a red traffic signal light: An archival study. Human Factors and Ergonomics Society, Seattle, WA.

Seligman, L. D. (1993, April). Speed and accuracy in solving complex mental arithmetic problems. Eastern Psychological Association, Arlington, VA.

HONORS

- Graduated Cum Laude, B.A. - Psychology
- Psi Chi National Honor Society in Psychology

Professional Affiliations

- American Psychological Association, Student Affiliate
- APA, Division 12 - Clinical Psychology
- APA, Division 35 - Psychology of Women
- Association for the Advancement of Behavior Therapy