



Development and Malleability from Childhood to Adulthood

INTRODUCTION:

In preparing this revised application for a competitive renewal, we considered thoroughly the substantive and thoughtful concerns of the reviewers as well as their appraisals of the strengths of the previous proposal. The latter include the *life course/social field* framework, which has guided the PI's research career and has contributed to the child development and prevention science literatures. Additional strengths of the previous proposal as noted by the reviewers were the focus on the modeling of the course of development and psychopathology from first grade through early adulthood and the development of a competent team of researchers to facilitate the analysis and dissemination of the results. The current application continues to be guided by our *life course/social field* framework and an emphasis on the charting of normative and pathological development into adulthood. Moreover, we continue to have a strong research team.

In addition, we continue to be interested in the study of the impact of our theory-based interventions on their distal targets of affective, antisocial, and substance abuse disorders. We should note that we are in complete agreement with the reviewers that the interventions' impacts are limited. Nevertheless, we are cognizant of the wide variation in individual responses to the interventions (for small, but identifiable sub-groups, the effects are large and for other subgroups there are no effects). The scientific team involved is not advocating further data collection to study a weak effect, rather it is interested in using the variation in responses to further inform the field about normal and pathogenic development and malleability.

In preparing this re-application, we have altered the composition and time commitments of the members of our research team to ensure the efficient production of high quality analysis and dissemination in accord with the previous review. We have also made a number of changes within the body of the application in response to the concerns raised by the reviewers. The major concerns were: a request for a more detailed justification for the new waves of data collection as well as the increased breadth of the proposed assessments; the need to specify more clearly what data would be used to test the models proposed; the strategies to be employed in reducing the data; clarification of the timing of the assessments; and more details regarding our efforts to trace youths who leave the school system or who drop out of school prior to the planned assessments.

We detail below how each of these major issues has been addressed in the revised proposal:

1. A More Extensive Justification for the Collection of Additional Data. We now elaborate more fully in the proposal how the collection of additional data at ages 17-18 and 19-20 will serve important purposes. First, we will be able to extend our study of the evolving course of social adaptational status and psychological well-being from early childhood through adolescence and into early adulthood, when the workplace and intimate social fields and, potentially, the family of procreation social field, become salient.

Second, the new data collection will provide us with incidence and prevalence rates for psychiatric disorders in adolescence and early adulthood, a period in which elevations in the risk of major disorders are expected. Thus, the proposed data collection will allow us to model the evolving relationship between social adaptational status and psychological well-being over a very vital period of the life course. Moreover, the two year interval between the proposed interviews will enable us to assess and model with considerable precision the variation in the incidence and course of psychiatric disorder as a function of the evolving characteristics of the youth and the social fields of family, work place, peer group, intimate relations, classroom and neighborhood. Likewise, the reciprocal effects may also be more readily evident. As noted by the reviewers, a strength of our study is the epidemiologically defined community sample of adolescents and young adults, which allows us to reduce the selection biases that compromise many of the studies in the field.

2. The Data to be Used in Testing the Developmental Models. We now more clearly specify in the measurement and data analytic sections the variables to be used in our developmental models. At least some of the reviewers' confusion around this issue stems from some omissions in the tables describing the data available from first through ninth grade as well as the data to be collected. Importantly, we now make clear that in addition to the use of a structured psychiatric interview (the CIDI-UM) we will readminister as part of our follow-up interviews the same first stage youth self-report measures of anxious and depressive symptoms used since first grade. Along with CIDI-UM, we will also administer the same youth self-report measures used in grades 3-9 to assess antisocial/delinquent behavior and substance abuse. Finally, we will readminister the same scales used from third to ninth grades to measure exposure to deviant peers and neighborhoods and the youth's self-report of the following parenting constructs: behavior management, monitoring, involvement in learning and behavior, and rejection. Thus, we will have considerable continuity in variables, sufficient to extend our growth curve analyses from childhood into adulthood.

3. Strategies to be Employed to Reduce the Data. We now begin the data analytic section with our strategies for reducing the data and the development of the measurement models (see Section 6.1). These include the a priori grouping of items based on theory and the testing of these measurement models through the use of confirmatory factor analytic strategies.

4. More Details Regarding the Procedures to be Employed to Trace Youths Who Drop Out of School or Who Leave the System. We describe in greater detail in the body of the proposal

our intended procedures for tracing youths who have left the school system or who have dropped out of school. It should be noted that at the first proposed data-collection wave (ages 17-18) the majority of participants will still be in the school system, or will have only recently left it. We will capitalize on our comprehensive access to the school information systems for tracking those who have left the system. The additional strategies outlined in the body of the grant have been successfully used by Dr. Ensminger and colleagues to trace over 80% of the sample in their age 32 follow-up study of the Woodlawn 1966-67 first grade cohort. The 1966-67 cohort were reassessed between 14 and 16 years after leaving the Chicago school system.

5. Who is likely to be Lost and How will the Causal Models Take into Account Missing Data. We have already found consistent evidence of a small but measurable relationship between missingness due to mobility and absence and prior ratings of aggressive behavior and achievement. We anticipate that those who are continuing to exhibit externalizing behaviors during late adolescence will be somewhat harder to locate than those with less externalizing behaviors, and therefore we will need to allow for differential attrition in some of our analyses. We describe in Section 6.2 the procedures to be used in dealing with missing data in our analytic models, including those described in Rubin (1976), Little and Rubin (1987), Dempster, Laird, & Rubin (1977) and Brown (1990). Additional procedures are based on the latest missing data methods developed at the University of South Florida for handling nonrandom (nonignorable) missing data (Brown, 1990; Brown & Zhu, 1994). Given Dr. Brown's involvement, our complete dataset (extant and proposed) will allow for further methodological advances in this area.

6. The Timing of the Assessments Do Not Allow for the Study of the Transition to High School and into Early Adulthood. As the reviewers pointed out, our previous application was ambiguous in its description of the timing of the proposed assessments in relation to the developmental stages of key scientific interest. Consequently, we have revised the current proposal to include assessments at ages 17-18 and 19-20, essentially, late-adolescence and early adulthood. The first data collection at age 17-18 just follows the legally permitted age for dropout and is just prior to the transition from high school. The proposed data collection spans a period when individuals must face the increasing social task demands of the work, high school/college/vocational school, intimate relations, and family of procreation social field, along with the evolving demands of their family of origin and peer social field.

7. The CIDI versus DISC 2.3 and DIS-III-R. The reviewers felt the CIDI 1.1 had a number of advantages over the DISC 2.3 to assess psychiatric disorder in the youth. Among the advantages is the provision of life time diagnoses. We agree and have revised our proposed assessment battery to include the use of the CIDI-UM for the youth. However, since the CIDI does not include ADHD or Conduct Disorder modules, we will administer these two modules from the DISC 2.3-C. We plan to use Kessler's latest revision of the CIDI, which is intended to improve the determination of incidence in repeated assessments. However, we will carefully monitor progress in the development of the CIDI and employ the most methodologically sound version.

8. The Addition of a Measure of Personal Control. The reviewers recommended the inclusion of a measure of personal control to complement the measure of attributional style proposed. We

agree and have included such a measure.

9. Composition of the Scientific Team and Data Management Staff. In response to the previous application, the reviewers asked for an improved justification for the subcontracts to Drs. Feehan and Crijnen, but also noted the project "seems short on manpower" to conduct analyses and manage the data-set. Given the pressures of our proposed data-collection and time available to conduct analyses, we have made a conscious effort to restrict membership of the scientific team to investigators with extensive experience (and a publication track record) in developmental psychopathology or prevention science, coupled with comprehensive knowledge of our theoretical and analytic orientation and an intimate working knowledge of our database. As a result, Dr. Feehan has been retained (now as faculty rather than through a subcontract). We have also included a subcontract to Dr. Brown's Prevention Science Methodology Group at the University of Florida, and included Drs. Anthony and Werthamer-Larsson as Co-investigators. We also have strengthened our data management team.

10. Limited Measurement of Substance Abuse, Dating, and Delinquency. We now make clear that data on delinquent behavior has been gathered since third grade from our youth self-report measure, and on aggressive behavior from entrance to first grade annually through teacher interviews, and school records regarding disciplinary actions. Peer nominations and independent observations of aggressive behavior were done systematically through grades 1 and 2. Parent reports on delinquent behavior were collected at grades 4 and 6. We are now in the process of gathering data from juvenile court records through Judge David Mitchell, Chief Judge of the Juvenile Court. Data on substance abuse and violence were also gathered as part of a collaborating grant from NIDA to Dr. Anthony (Co-Investigator) from third through ninth grades. In the proposed study, we will continue to use school and court data along with the same youth self-report measures of social adaptational status (SAS) and psychological well-being (PWB). We will also include the CIDI substance abuse and antisocial personality behavior disorder modules, supplemented by the DISC 2.3 Conduct Disorder and ADHD modules. Windle's (1994) recently developed measure of adolescent's intimate friendships will be used to assess success in the peer and intimate relations social field along with Harter's Romantic Relations subscale. A life-history interview has also been included to accurately gauge the timing and sequencing of the major developmental transitions across the various social fields (dating, parenthood, employment, school leaving etc.).

11. An Approach to Maintaining Invariance of the Measurement Model Over Time While Insuring the Developmental Relevance of the Model. A critical assumption in latent growth curve analysis, as well as in structural equation modeling when applied to longitudinal data, is that the measurement model is invariant over time. Yet from our life course developmental perspective, change over time in the salience as well as the phenomenology and structure of many of the constructs of interest is assumed. Indeed, from a developmental perspective, one would expect that the phenomenology of aggression would vary over time, such that adolescents would be more likely to engage in lethal forms of aggression than younger children. For instance, the item "causes serious physical harm to others" may load more highly on an aggression factor in adolescence than early childhood. Moreover, with respect to our models of the development of

aggression, one might hypothesize that parental monitoring and supervision will take on increasing importance in late childhood and early adolescence. This is in light of the increasing influence of peers during this time, along with the youth's quest for spending unsupervised time with peers, and the contribution of deviant peers to aggression.

We have not found any simple solution to the need for a measurement model that is invariant over time, but is developmentally relevant. Our general rule when it comes to making developmentally sensible changes in our measurement framework has been to add items to our assessment instruments as opposed to substituting or deleting items. In this way, we maintain a common set of manifest indicators of key constructs over time, which allows us to examine change in their contribution to the latent structure of the measurement model over development. Besides adding items, rather than deleting them, we have also added new instruments to tap developmentally relevant constructs. For instance, as noted above, we propose to add the CIDI to our measurement battery for assessing psychiatric disorder in late adolescence and early adulthood. This is consistent with evidence from the NIMH Epidemiologic Catchment Area studies that late adolescence and early adulthood represent a period in the life course that appears to mark the evolution from psychiatric symptoms and socially maladaptive behaviors to psychiatric disorders. Nevertheless, we will continue to administer our brief, first stage, youth self-report measures of delinquent and violent behavior and substance use. The proposed addition of measures of success in the work, intimate relations and close friendship social fields further reflects this strategy of adding items as opposed to deleting or changing them.

Of course, we are always concerned with respondent burden and, as such, any changes in the measurement framework are pilot tested to insure the respondent is not overwhelmed by the length of the battery and perceives the items as relevant to his/her stage in the life course. These pilot studies also provide us critical data on the psychometric properties of the measures.

1. SPECIFIC AIMS

This proposal seeks to broaden our understanding of normal and pathogenic developmental paths and their variation and malleability from school entry through adolescence and into early adulthood. We will build on the scientific value of an existing, prospective, developmental epidemiological data base involving a defined population of two cohorts of urban first-graders, whose psychological well-being (PWB) and social adaptational status (SAS) in the classroom, peer group, and family social fields have been assessed periodically from 1985 through 1994 (ages 6-7 to 14-15, Grades 1-9). This representative population of first grade children was comprised of two consecutive first grade cohorts from 19 elementary schools in five poor to middle class Baltimore urban areas ($N_I = 1196$ and $N_{II} = 1115$). Within each urban area three or four matched schools were randomly assigned to one of two theory-based preventive interventions or to a matched control condition. Within each school, the children were randomly assigned to control classrooms or to classrooms with one of the interventions. Each intervention specifically targeted one of two correlated confirmed antecedents of later symptoms and disorders. One intervention (Good Behavior Game, GBG) was aimed at aggressive behavior, an antecedent of later conduct, antisocial personality and substance abuse disorders. The other

intervention (Mastery Learning, ML) was aimed at poor school achievement, an antecedent of later depressive and anxious symptoms and possibly disorders (Kellam & Rebok, 1992). This design provides both internal and external control children for modeling developmental paths and their variation, which is a primary focus of this application. Data from children in the interventions allow modeling of the malleability of the targeted antecedent and the developmental consequences of the interventions. As reflected in Section 3.0 (Progress Report), we have already learned much from these data about normative and pathogenic development and malleability and its variation.

Extension of the data set through ages 17-20 will enable us to assess the relationship between the course of psychological well-being and social adaptational status in childhood and success in responding to the social task demands of the work, intimate relations, peer group, family and classroom social fields in late adolescence and early adulthood. It also enables us to assess psychiatric symptoms and disorders well into the life stage where the increased incidence and prevalence of affective, antisocial and substance abuse disorders occurs. Further, the extensive data set will allow us to assess variation in the malleability of developmental paths, by comparing sub-groups of children across the two cohorts who responded differentially to the interventions. This is an important strategy in understanding developmental mediation and moderation, and the potential responses of sub-groups of children to specific prevention strategies (Farrington, 1994; Kellam and Rebok, 1992). The unique scientific opportunities the proposed data collection provides are reflected in the study's specific aims:

1. Modeling Social Adaptational Status and Psychological Well-Being. To model from entrance to first grade through adolescence and into early adulthood the evolving relationships between psychological well-being in terms of psychiatric symptoms and disorders and success and failure in meeting the social task demands of the classroom, peer group, family, and intimate relations and work social field.

2. Modeling Developmental Psychopathology. To model the development of psychopathology from the entrance to first grade through adolescence and into early adulthood--examining the phenomenology, timing, circumstances of onset, continuity, and inter-relationships among psychiatric symptoms. In addition, to assess the incidence, prevalence, and comorbidity of emerging affective, antisocial, and substance abuse disorders.

3. Modeling Mediation and Moderation of Developmental Outcomes. To model from entrance to first grade through adolescence and into early adulthood variation in social adaptational status and psychological well-being as mediated or moderated by the evolving characteristics of the individual and of the social field of the family, school, peers, and community, and the emerging intimate and work social fields. This aim also includes the modeling of help-seeking and service utilization as influencing developmental outcomes.

4. Modeling Malleability of Developmental Paths. To model from entrance to first grade through adolescence and into early adulthood variation in developmental paths as a function of the early responses to the two preventive trials. This aim emphasizes the role of preventive interventions as experimental tests of elements of developmental theory and models. It incorporates

intervention within the developmental models studied in Aims 1-3 above in attempting to understand the malleability of processes that influence social adaptive capacity.

2. BACKGROUND AND SIGNIFICANCE

This proposed work represents the next stage of an ongoing prospective study of variation in life course development and its malleability from early childhood to young adulthood. The focus of this research is on the relationship between success in responding to the social task demands individuals encounter over the life course and their psychological well-being (PWB). The early phase of this research provided an experimental test of the relationship between success or failure in responding to two critical social task demands of first and second grade--academic achievement and authority acceptance--and PWB over the course of elementary school and through middle school. (See Section 3.2 for description of the interventions).

Empirical support for directing interventions at these two maladaptive behavioral responses (poor academic achievement and aggressive behavior) includes findings from Woodlawn and other studies that learning problems predict psychiatric distress, particularly depressed mood and depressive disorder (Kellam, Brown, Rubin, & Ensminger, 1983; Shaffer, Stokman, O'Connor et al., 1979). Aggressive behavior, as early as first grade, predicts later antisocial behavior, criminality, and heavy substance use (Ensminger, Kellam & Rubin, 1983; Kellam et al., 1983; Farrington & Gunn, 1985; Robins, 1978). Further, in the Woodlawn studies, aggressive behavior interacted with shy behavior to increase the risk of later delinquency and substance use. As elaborated on later in this proposal, we hypothesize that this increased risk may in part be due to the fact that shy/aggressive children who break rules and fight are often rejected and socially isolated by mainstream peers and teachers (Block, Block, & Keyes, 1988; Ensminger et al., 1983; Farrington, Gallagher, Morely, St. Ledger, & West, 1988; Farrington & Gunn, 1985; Hans, Marcus, Henson, Auerbach, & Mirsky, 1991; Kellam et al., 1983; McCord, 1988; Schwartzman, Ledingham, & Serbin, 1985).

The most recent phase of our work (funded by both NIMH and NIDA RO1s) focused on the transitions into middle school and high school. Our interest centered on the extent to which early social adaptation facilitated subsequent social adaptation and psychological well-being in the face of the developmental challenges associated with pre- and early adolescence. As described in the progress report (Section 3.0), our analyses have tested theoretically-based hypotheses which, in turn, have shaped the questions proposed in the present application. We seek to extend these studies into the social fields relevant to adolescence and young adulthood, including the emerging fields of work and intimate relationships, and the evolving demands of the classroom, peer group, and family. The additional data will allow consideration of alternative paths by which individual and environmental factors contribute in combination or through interactions to the development of normative and pathological outcomes. Developmental models derived from an epidemiologically-defined data set extending from school entry into early adulthood will allow for examination of a) critical temporal aspects of developmental pathways, b) the potential targets, timing, and social contexts for preventive interventions (Lorion, Price, & Eaton, 1989), and c) the duration of their impacts as influenced by mediating or moderating individual, social

field, and community variables, including mental health and human services utilization. Further, our research program will expand our understanding of the prescriptiveness with which preventive interventions can be targeted and the precision with which their impacts can be measured.

2.1 The Life Course Developmental Epidemiological Framework Guiding the Research

Our research is conceptually grounded in the *life course/social field* framework (Kellam, Branch, Agrawal, & Ensminger, 1975) represented in the recent Institute of Medicine report on the state of prevention science (Mrazek & Haggerty, 1994). This framework focuses on the measurement within epidemiologically defined populations of earlier maladaptive behavioral responses to specific social task demands, within specific social fields, that increase risk of later poor mental health outcomes. It also focuses on the parallel measurement of psychological well-being, which is viewed as both an antecedent and consequence of social maladaptive responses. Finally, the *life course/social field* framework includes an emphasis on the measurement of individual and contextual influences that enhance or inhibit the risk of the mental health outcomes.

Central to *life course/social field* theory is the concept that individuals face specific social task demands in specific social fields across the major *transition periods* over the life span (Kellam & Rebok, 1992; Connell & Furman, 1984; Rindfuss, 1991). The specific social task demands the individual confronts through each stage of life are defined by individuals in each social field whom we have termed the *natural rater(s)*, who not only defines the tasks but rates the adequacy of performance of the individual in that social field. Parents function as natural raters in the family, peers in the peer group, teachers in the classroom, and supervisors in the workplace (Kellam, 1990; Kellam et al., 1975; Kellam & Ensminger, 1980). This interactive process of demand/response to social task demands is termed *social adaptation*, and the judgments of adequacy of the individual's performance by natural raters *social adaptational status* (SAS) (Kellam et al., 1975). From this perspective, social adaptation is the central element in the broader concept of socialization.

In accord with our *life course/social field* framework, the salience of particular social fields and their task demands varies across the life course. A prominent developmental transition early in the life course is entrance into the school social field. The developmental challenges associated with this transition include separation from parents and the engagement with new natural raters (teachers and peers). Moreover, upon entrance into the classroom, the child is confronted by the teacher's demand for academic achievement, to obey rules, to pay attention, and to participate socially in classroom and peer activities. The transition into middle school and adolescence provides another set of developmental challenges, including the emergence of the intimate and work social fields and their associated demands. These later two social fields become particularly salient in early adulthood. Importantly, however, some adolescents will face the demands of parenthood and the family of procreation social field as the result of teen pregnancy. Furthermore, many adolescents in our study population will have dropped out of school and entered the work social field. Indeed, the age at which individuals make transitions across social fields may vary considerably (Danish, Smyer, & Nowak, 1980; Rindfuss, 1991). Prospective,

epidemiological studies, such as ours and our partners' in New Zealand and Chicago, allow for the comparison of the antecedents and consequences of such variation in developmental paths (Ensminger & Slusarcik, 1992; Feehan, McGee, Williams, and Nada-Raja, in press).

In contrast to SAS, *psychological well-being (PWB)* in our *life course/social field* framework refers to the individual's internal state, as reflected in anxiety, depression, bizarre feelings and thoughts, and self-esteem. The distinction here is between the failing math grade as an example of SAS, and the decrement in PWB in the form of depressive and anxious symptoms as a result of the poor grade. Thus, PWB is hypothesized to be intimately related to SAS. We hypothesize the relationship is a reciprocal one, such that PWB may serve to either facilitate or disrupt social adaptation, while SAS may increase or decrease PWB. The complex interplay between SAS and PWB and the malleability of each as a function of the other is the subject of this research.

Our *life course/social field* framework embodies the principles of an organizational approach to development (Cicchetti & Schneider-Rosen, 1984), wherein normal development is marked by the integration of earlier competencies into later modes of function, with the earlier competencies remaining accessible, ready to be activated and utilized during times of stress, crisis, novelty, and creativity. It follows then that early successful social adaptation tends to promote later adaptation as the individual traverses the life course and encounters new and different social task demands across the main social field. Pathological development, in contrast, may be conceptualized as a lack of integration of the social, emotional, and cognitive competencies that are important to achieving social adaptation and PWB at a particular developmental level (Cicchetti & Schneider-Rosen, 1984; Loeber, 1991).

Our framework also includes a community epidemiologic perspective. Community epidemiology is concerned with the non-random distribution of a health problem or related factor in a fairly small population in the context of its environment, such as a neighborhood or school. The integration of life course development with community epidemiology allows the study of variation in developmental antecedents and paths in a defined population in defined ecological contexts. Antecedents along the paths can be precisely targeted, their frequencies determined, and the variation in their function assessed with markedly reduced bias in the subject selection. The preventive trial, when implemented at the universal level, then can be aimed at the question of the malleability of the antecedent and its relationships to other aspects of developmental models and to outcomes. Such trials not only allow the exploration of the variation in developmental paths, but also the differences among the responders and the non-responders to the preventive intervention.

2.2 An Application of Our Developmental Epidemiological Framework to the Etiology and Course of Depressive Symptoms and Disorders

In our developmental epidemiologic framework PWB is in part determined by an individual's perceptions of their successes and failures in meeting the demands of their natural raters. Consistent with the reformulated learned helplessness theory of depression (Abramson, Seligman, & Teasdale, 1984; Seligman & Peterson, 1986), we hypothesize that individuals who fail to meet the social task demands of their natural raters and attribute their failures to internal,

stable, and general self-causes will be at greater risk to experience helplessness and decrements in self-worth. Helplessness and poor self-worth are seen as antecedents to depressive symptoms and disorders. This is consistent with Abramson et al.'s (1978) concept of the "personal helplessness" form of depression, which involves a perceived lack of control over important outcomes that others are capable of mastering.

The mechanisms by which the enhanced ML intervention in first and second grade was hypothesized to have its effect are consistent with our model of the link between SAS and PWB. First, ML was hypothesized to result in improved reading achievement. This, in turn, was hypothesized to result in the natural rater, the teacher, providing feedback to the children that they had been successful in meeting a key social task demand of the classroom. Consequently, the children's self-worth and perceived competence should improve, thus reducing the risk for psychological distress in the form of depressive symptoms or disorders. With respect to longer term effects, we hypothesized that improvements in perceived competence should result in increased effort in the academic domain and, subsequently, sustained improvements in achievement. These improvements in achievement should then set the stage for success in meeting the increasing academic demands of the classroom in adolescence and of the work social field in early adulthood. Mastery of SAS in these social fields may generalize to peer group and intimate fields. Alternatively, mastery in these social fields may protect the individual's PWB if poor SAS occurs in the peer and/or intimate fields.

In accord with our *life course/social field* framework, we posit that there may be a number of factors leading to variation in intervention outcomes and the probability of an individual experiencing depressive symptoms or disorders. Perhaps foremost, is the individual's perception of self-competence in meeting the social task demands in a specific social field and the salience of that domain to the individual's self-worth. A second factor may be the degree of convergence among the natural raters with respect to the individual's performance of social task demands and their assessments of the individual's successes and failures. A lack of convergence with respect to whether an individual has succeeded or failed at a task and/or to what those successes and failures are attributed may decrease the probability of the individual experiencing depression as a result of her performance. The probability of an individual experiencing depression may also be a function of the number of the task demands she fails. The more demands she fails to meet and the more social fields in which failure occurs, the greater the probability of depression. While emphasizing the role of adaptation to normative social task demands in the etiology of depressive symptoms and disorders, our framework can also accommodate non-normative events, such as the death or illness of a parent, family conflict, or the chronic stresses associated with poverty. Relatedly, a factor that may moderate or mediate the risk of depression are individuals' perceptions of the social support available to them to help cope with normative and nonnormative stressors. Children and adolescents who perceive help is available may be less likely to feel helpless and/or hopeless in the face of normative and/or nonnormative life events (Baron & Kenny, 1986). Finally, service utilization or treatment may alter the course of depressive symptoms and disorders either through direct facilitation of adaptation to normative social task demands, or indirectly, by facilitating coping with failure to meet task demands.

2.3 An Application of Our Developmental Epidemiological Framework for Understanding the Etiology and Course of Antisocial Behavior and Conduct Disorder

Our framework for understanding the etiology and course of antisocial behavior relies heavily on the integration of our developmental epidemiologic perspective with the life course developmental model of antisocial behavior described by Patterson, Reid, and Dishion (1992) and, more recently, by Capaldi and Patterson (in press). According to Patterson and colleagues, one of the major pathways to delinquency and antisocial behavior in adolescence begins in the toddler years, when parental success in teaching their child to interact within a normal range of compliance and aversive behavior is a prerequisite for the child's development of social survival skills (Patterson, 1986). Alternatively, the parents' failure to effectively punish coercive behavior during these formative years and to teach reasonable levels of compliance comprises the first step in a process that sets into motion patterned exchanges of coercive behaviors among family members, which serve to "train" the child to become progressively more coercive and antisocial. Upon the transition to school, such children prove difficult for either teachers or peer groups to teach, owing to their coercive and non-compliant stance. Over the course of elementary school, Patterson and colleagues postulate that their coercive style ultimately leads to rejection by not only their parents, but by teachers and well adjusted peers. They note that the deficits in academic, social, and occupational survival skills often seen in these children are then a consequence of this rejection, as parents and teachers fail to adequately monitor or supervise the child or reinforce prosocial behavior and academic achievement. The failure of parents to adequately monitor their children is seen as particularly critical during adolescence, when developmentally their children are seeking greater independence and are spending more time outside of their parents' direct supervision. Ultimately, Patterson et al. (1992) argue the lack of adequate monitoring by parents in early adolescence, and rejection by teachers and mainstream peers precipitates "drift" into a deviant peer group, where reinforcement for a wide array of antisocial behavior and delinquent behavior, including alcohol and drug use, is provided (Sampson & Groves, 1989). Moreover, these youths enter the work social field in late adolescence and early adulthood without the necessary social survival skills to compete for well-paying and secure jobs. Their entrance into the intimate relations social field may also be marked by failure, given their coercive style of interpersonal interaction. Failures in each of these social fields then increases the likelihood of decrements in psychological-well-being in the form of psychiatric symptoms and disorders.

In support of Patterson et al.'s (1992) "basic training" model, we have found that poor parental monitoring is associated with early initiation and continuing use of drugs in our study population (Chilcoat, Dishion, and Anthony, 1995; Chilcoat and Anthony, submitted). Moreover, in line with Patterson and Stouthamer-Loeber (1984), parental monitoring practices were shown to correlate significantly with both self-reported delinquency and the frequency of school disciplinary removals and expulsions (Ialongo, Pearson, Werthamer-Larsson, & Kellam, in preparation). In addition, parental rejection was associated with decreased parent involvement in the form of monitoring and supervision (Ialongo et al., in preparation). Consistent with the Patterson et al. (1992) basic training model, the mechanisms by which the GBG intervention in first and second grade was hypothesized to have its effect are: 1) the GBG should reduce

aggressive and coercive behavior in first and second grade; 2) this, in turn, should reduce rejection by teacher and peers; 3) consequently, teachers and peers should be able to "teach" the child key social survival skills--academic as well as interpersonal; and 4) as a result, the child would be less likely to drift into a deviant peer group, or be assigned to a poor achieving aggressive behaving class or track, where reinforcement of antisocial and delinquent behavior is provided. Ultimately, the youth would be less likely to fail in the work and intimate social relations fields.

As with our developmental epidemiologic model of depressive symptoms and disorders, we posit that a number of factors may influence variation in intervention outcomes and the probability of aggressive behavior and/or a disruptive behavior disorder. Capaldi and Patterson (in press) provide a framework for understanding the confluence of interrelated contextual factors on antisocial behavior in childhood and adolescence. The factors they discuss operate at the level of the individual child, family, neighborhood, school, and community. These factors are seen as transacting within and across levels and including non-normative as well as normative events. There are number of mechanisms by which these various contextual factors may come to disrupt parenting practices and, thereby, increase the risk for aggression and disruptive behavior disorders (Capaldi & Patterson, in press). For example, due to daily hassles and major life events the parent may be psychologically and/or physically unavailable to appropriately monitor or manage the child's or adolescent's behavior. The risk of physical or psychological unavailability may be particularly high in a poor, single parent family. In terms of broader contextual factors, the effect of the GBG on later antisocial behavior or substance use may be modified by the extent of neighborhood adolescent criminal activity, prevalence of substance abuse, or overcrowding. Finally, developmental outcomes and the impact of the interventions may also vary as function of the characteristics of the child's classmates and the quality of the school environments. The incidence and prevalence of the target behaviors within the classroom may, therefore, be an important influence on an individual child's performance not only during the intervention, but also in the post-intervention period.

2.4 Comorbidity and the Pathways to Antisocial and Depressive Disorders

A final issue to be addressed as part of our models of the developmental pathways to antisocial and depressive symptoms and disorders is that of comorbidity. In both adolescence and early adulthood, comorbidity of disorder is common (McGee, Feehan, Williams, Partridge, Silva, & Kelly, 1990; Feehan, McGee, Nada-Raja, & Williams, 1994). Moreover, those with comorbid disorders in adolescence carried significantly elevated risk of disorder in early adulthood (Feehan, McGee, & Williams, 1993). In considering the issue of comorbidity, Caron and Rutter (1991) point out a study of condition X may produce findings that in fact are largely a consequence of the ignored comorbid condition Y. Of note, there is considerable evidence depression and anxiety are highly comorbid. Consequently, it will be important for us to identify whether outcomes associated with depressive symptoms and disorders are affected by the presence or absence of anxious symptoms and disorders. Caron and Rutter (1991) also suggest a comorbid pattern may constitute a meaningful syndrome. Relatedly, Quay (1986) argues that multivariate studies of child psychopathology favor the presence of a broad band disorder of

anxiety, withdrawal, and dysphoria as opposed to a narrow band disorder, the equivalent of major depressive disorder. Thus, in our study of the specificity of depressive symptoms and disorder, it would also be important to understand whether depressive symptoms exist in the absence of anxiety and withdrawal. As a further explanation of comorbid patterns, Caron and Rutter also suggest one disorder may create an increased risk for the other. Thus, consistent with the developmental epidemiological model guiding the proposed research, we will test whether the relatively high level of co-morbidity between major depressive disorder and the antisocial behavior disorders may be a function of the child's failure to negotiate the demands of teachers, parents, and peers for accepting authority, obeying rules, and appropriately modulating attention, aggressive behavior, impulsivity, and motor activity.

3. PROGRESS REPORT AND PRELIMINARY STUDIES

In this section we summarize the progress made towards the aims of the first five years of this grant, which forms the foundation for realizing the aims of the proposed next five years of research.

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Brown, C.H., & Zhu, Y. Compromise solutions to inferences with nonignorable missing data.

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3.2 An Overview of Design of the Two PRC Preventive Intervention Trials

The intervention design involved two first-grade cohorts of students in 19 Baltimore City Public Schools. Cohort I began school during the 1985-86 academic year and Cohort II during 1986-87. The two universal classroom-based interventions were implemented over first and second grades for each cohort. Five different urban areas within one large elementary school district in eastern Baltimore were selected with the involvement of the Baltimore City Planning Department. Each of these five urban areas vary in terms of social class. Three or four schools were selected in each urban area that were well matched with regard to census tract, school level, and first and second grade data. Within these clusters of schools by a random process, one school received the MI intervention, one the GBG intervention, and one school served as a control school (to provide protection against within-school contamination). Within each intervention school, children were randomly assigned to classrooms. Classrooms not receiving any interventions were included as internal controls, thus holding constant school, family, and/or community differences such as the effect of the principal on the school environment. Teachers were also randomly assigned to intervention condition. Baseline assessments were carried out prior to the initiation of the intervention. Control and intervention teachers received equal attention and incentives. The training sessions continued throughout the intervention period (Grades 1 and 2 for both cohorts)

for approximately 40 hours totally for each intervention.

The GBG was directed at improving classroom aggressive behavior, and the ML at improving school achievement. The GBG (Barrish, Saunders, & Wolf 1969) represents the systematic use of behavioral analysis in classroom management. The GBG was selected because of its demonstrated efficacy and acceptability to the schools and the community. ML is a teaching strategy with demonstrated effectiveness in improving achievement. The theory and research upon which ML is based specifies that under appropriate instructional conditions virtually all students will learn most of what they are taught (Bloom, 1976; Bloom, 1982; Block & Burns, 1976; Dolan, 1986; Guskey, 1985).

3.3 Summary of Ongoing Analyses and Results

The main findings forming the basis for the aims of the next stage of our work are summarized below.

3.3.1 Aim 1: Modeling SAS and PWB. We have tested our life course model of the relationships between maladaptive responses to the social task demands over the course of early elementary school and PWB (Kellam, Werthamer-Larsson, Dolan et al., 1991). Poor achievement, aggressive behavior, shy behavior, and concentration problems were the socially maladaptive responses studied. From fall to spring of first grade, concentration problems led to aggressive and shy behavior as well as to poor achievement in both genders. Among females, concentration problems led to depressive symptoms directly, and for both males and females concentration problems led to poor achievement. There was also evidence for more reciprocal relationships among females between SAS and PWB in that depressive symptoms in the fall of first grade led to poor achievement in both genders, while poor achievement led to depressive symptoms among girls, but not among boys (Kellam et al., 1991). This baseline model of the relationships of SAS and PWB has been replicated in part through the transition to middle school (see under Aim 2 Ialongo et al., 1993; 1994; and 1995). Further replication of the baseline model is described in Kellam, Rebok, Mayer, Ialongo, & Kalodner (1994). Overall, the baseline analyses strongly suggested the need for the development of interventions aimed at concentration or attention problems. A protocol targeting specific attentional components and concentration behavior has now been designed and submitted for funding (G. Rebok, PI).

3.3.2 Aim 2: Modeling Developmental Psychopathology. In two papers we reported on the prevalence, stability, internal consistency, caseness and phenomenology of depressive symptoms over the elementary school years (Edelsohn, Ialongo, Werthamer-Larsson, Crockett, & Kellam, 1992; Ialongo et al., 1993, See Appendix C). In the first paper, we found children's reports of depressive symptoms to be relatively stable over a four-month interval in first grade. The level of stability was particularly strong for children initially in the highest quartile of depression, all of whom remained in the highest quartile at retest, four months later. In addition, depressive symptoms were significantly related to the negotiation of a number of salient developmental tasks at entrance to first grade, including academic achievement, peer relations, and attention/concentration in the classroom. Moreover, the relationships between depressive symptoms and the various indices of social and academic functioning remained stable over the

four-month test-retest interval. In Ialongo et al. (1993) first grade depressive symptoms were found to have significant prognostic value in terms of levels of depressive symptoms and adaptive functioning in fifth grade, with the strength of prediction varying by gender in the former. Although there was a moderate increase in short-term stability from first to fifth grade, it remained consistently strong across first, fourth, and fifth grades. The magnitude of the relationship between depressive symptoms and adaptive functioning also remained consistent over time. The findings on stability, caseness, and prognostic power attest to the significance of children's self-reports of depressive symptoms in the early as well as the middle to late elementary school years.

Two parallel papers (Ialongo, Edelsohn, Werthamer-Larsson, Crockett, & Kellam, 1994; Ialongo, Edelsohn, Werthamer-Larsson, Crockett, & Kellam, 1995, see Appendix C) examined the stability, prevalence and caseness of children's self-reports of anxious symptoms. Self-reported anxious symptoms in first grade proved relatively stable over a four-month test-retest interval, more so for boys than girls. In addition, they appeared to have significant impact on academic functioning. The prevalence of clinically significant anxiety was 2.5 % (Ialongo et al., 1994; Ialongo et al., 1995). First grade anxious symptoms were found to have significant prognostic value in terms of levels of anxious symptoms and adaptive functioning in fifth grade. These findings attest to the significance of such symptoms in the early as well as the middle to late elementary school years.

3.3.3 Aim 3: Modeling Mediation and Moderation. We have also examined the influence of the main social fields of the classroom, peer group, and family context on the course of SAS and PWB. We studied the effects of two specific dimensions of the first-grade classroom environment (classroom achievement and classroom aggressive behavior) on children's aggressive behaving, shy behaving, and concentration problems by the end of first grade (Werthamer-Larsson et al., 1991). Children in low achieving classrooms had significantly higher teacher ratings of aggressive and shy behaviors than children in mixed-achieving and high-achieving environments, after controlling for potentially confounding child and classroom characteristics. Classrooms that were on average viewed by their teachers as poor behaving had children who were significantly higher in shy behaving than children who were not in such classrooms after controlling for the child characteristics and classroom achievement effects.

Further analyses were done on the influence of classmates on the course of aggressive behavior in children through the first grade year. In the lower aggressive classrooms (divided at the median of the average classroom aggression ratings), both boys and girls were on the same slope of continuity between fall of first grade ratings and spring of first grade. In the high aggressive classrooms (i.e., those above the median in teacher ratings of aggression), boys were still on the same slopes although at higher levels of aggression, but girls were not. Indeed, girls in high aggressive classrooms tended to be less aggressive by spring even though they might have begun the school year with more aggressive ratings. This suggests that girls are more attuned to their classroom environments (as the earlier baseline modeling suggested) and that they appeared to actively resist the classroom environment generated by more aggressive boys (see Kellam, Rebok, Wilson, & Mayer, 1994c).

Associations between family structure and aggressive behavior were also examined amongst families varying on a number of demographic characteristics (Pearson, Ialongo, Hunter, & Kellam, 1994). Mother/alone households were compared to mother/father, mother/grandmother, and mother/male partner families. When all income groups were combined, teachers rated boys and girls in mother/alone families as more aggressive relative to mother/father families. However, among low income families, the protective effects for mother/father families were not apparent. Mother/male partner families were associated with an increased risk for teacher rated aggressive behavior for boys. The absence of a second adult in the family and the type of second adult, child gender, and income were important factors that moderated the associations between family structure and children's aggressive behavior in school. Associations between family structure and academic achievement (math and reading) were also examined (Poduska, Ialongo, Pearson, & Kellam, in preparation). As with the aggression analyses, the mother-alone structure was compared to mother-father, mother-grandmother and mother-male partner family structures. With all income groups combined, children in mother alone families were significantly more likely to be in the lowest quartile of both reading and math achievement than mother-father families.

Analyses on the relationship of parent monitoring and the onset of drug sampling in fourth and sixth graders were also carried out (Chilcoat, Dishion, & Anthony, 1995; Chilcoat & Anthony, submitted). The cross-sectional data showed that 12% of the children had initiated use of some substance, excluding alcohol use with parents' permission by fourth grade. Children in the lowest quartile of parent monitoring had the highest prevalence of ever sampling a drug. In following children from fourth to sixth grade, poor parental monitoring was associated with an increased initiation of experimentation with drugs.

3.3.4 Aim 4: Modeling Malleability of Developmental Paths. A major focus of our early analytic work was on the immediate malleability of the early antecedent risk behaviors of poor achievement and aggressive and shy behavior in response to the ML and GBG preventive trials, respectively (Dolan et al., 1993; Kellam, Rebok, Mayer, et al., 1994). In the more recent phases of our work, we have modeled the impact of change in the proximal targets of the interventions on the evolving course of SAS and PWB from childhood through early adolescence (Kellam, Rebok, Ialongo, & Mayer, 1994). Throughout our analytic work, we have sought to model variation in response to the preventive trials as a function of the initial as well as the evolving characteristics of the individual child and the social fields of classroom, classmates/peers, and family. For example, with respect to the individual characteristics of the child, we have included baseline levels of achievement and aggression and shy behaviors as predictors of response to intervention. More recently, in accord with our baseline model of SAS and PWB described above, we have demonstrated the role of concentration problems in influencing response to the GBG (Rebok, Hawkins, Krener, Mayer, & Kellam, in press). Understanding such variation is essential to the development of the next stage of our universal as well as selected or targeted interventions. Indeed, no one intervention strategy(s) could meet the needs of all children; and only through the systematic and theoretically driven study of responders and non-responders can we begin to more broadly address the intervention needs of defined populations of children. The selected intervention Dr. Rebok (Co-PI) is developing to address concentration problems in

young children is a product of our analyses of the variation in impact in the ML and GBG preventive trials.

In addition to examining variation in intervention impact as a function of the baseline characteristics of the youth and the social fields of classroom, family and peer group, we are exploring variation in impact as a function of cohort. This is a direct result of our failure to replicate, in some cases, Cohort I intervention impact analyses on achievement and aggression using Cohort II data. With regard to the problems with replication, it is important to point out that, first, the modeling of the relationship between SAS and PWB in Kellam et al. (1992) and Ialongo et al. (1993; 1994; 1995) replicates across cohorts as well as the impact of family characteristics on aggression and learning (Pearson et al., 1994; Vaden-Kiernan, Ialongo, Pearson, & Kellam, in press; Poduska et al., in preparation) and parental monitoring on early initiation of substance use (Chilcoat et al., 1995; Chilcoat & Anthony, submitted).

This was also the case for analyses on classroom contextual effects (Kellam, Rebok, Wilson, & Mayer, 1994). Second, the Cohort 2 analyses of impact on aggressive behaviors and academic achievement yielded trends, which, though non-significant, were nevertheless consistent with the Cohort 1 analyses. Moreover, as will be discussed below, we found a significant effect for the GBG in both cohorts on the distal outcome of the early initiation of tobacco use. Indeed, this effect was strongest in Cohort 2. Third, given the use of epidemiologically defined populations and theoretically based interventions, we are confident that the variation reflects real differences, not merely error in sampling. The question then remains why the variation in impact between cohorts? We are presently exploring four hypotheses. First, we are examining whether there was variation in implementation of the interventions across cohorts. In this regard, we have found some evidence that implementation in Cohort 2 was weaker than in Cohort 1. A second hypothesis we are exploring is that there was greater diffusion from intervention to control teachers in Cohort 2 than in Cohort 1. This may have been a consequence of the fact that the interventions were in place a year prior to the recruitment of Cohort 2. Thus, teachers would have had more opportunity to discuss and observe what was happening in their colleagues' classrooms. A third hypothesis centers on the fact that the range of baseline achievement scores and aggressive behaviors was somewhat more truncated in Cohort 2 than in Cohort 1. Consequently, there may have been less of an opportunity to find interactions with baseline in Cohort 2 than in Cohort 1. The truncation in range in baseline aggressive behaviors and academic achievement may have been a function of the diffusion effects discussed above. A fourth hypothesis concerns the baseline in Cohort II. Given that intervention and control teachers remained in their respective treatment conditions across cohorts, it is possible that the ML and GBG teachers initiated the interventions with Cohort 2 prior to the baseline assessments in mid-Fall. In hindsight, a methodologically sounder design would have involved replication of the Cohort 1 effects with a naive set of teachers and schools. In sum, we are continuing to explore each of these hypotheses in an effort to understand the variation in impact between cohorts.

Short and Longer-Term Impact of the GBG and ML Interventions. The short-term effects of the two interventions were analyzed along with the specificity of each from the fall through the spring of first grade. In Cohort I, each of the two interventions had a significant and very specific

impact on their proximal targets (Dolan, Kellam & Brown et al., 1993). ML resulted in significant short-term improvement in standardized reading achievement; whereas the GBG resulted in significant reductions relative to controls in aggressive and disruptive behaviors based on teacher ratings and peer nominations. Time sampling independent observations of classroom behavior also revealed significant effects for the GBG on the sum of aggressive and off-task behaviors in first grade in Cohort 1.

In terms of the longer term effects of the GBG, from second through fourth grade, there were no differences between GBG and control children (Kellam, Rebok, Ialongo, et al., 1994). Beginning with fourth grade, however, there were increasing reductions in aggression each year. The more aggressive first graders benefitted most from the GBG. One possible explanation for this delayed effect is that the GBG reduced the likelihood that children would drift into a deviant peer group in middle school, when peers become increasingly more influential and children spend significantly more time unsupervised by adults. As elaborated above, the deviant peer group may serve as a training ground for antisocial behavior (Patterson et al., 1992) during this stage of the life course. Along these lines, the school system may have been more likely to track the control children into classrooms with a greater prevalence of deviant peers after first grade, given the control children were on average more aggressive. The effects of the deviant peer group may have not become apparent until the transition to middle school, when peers become more influential and children spend more time unsupervised by adults. In general, GBG effects may be more observable at times of greater social demand for self-regulation--such as times of transition, like entrance to elementary school and the transition to middle school.

Shared and Non-Shared Responses to the ML and GBG Interventions. In terms of variation in response to the interventions, the impact of ML differed by gender with female high achievers benefitting more from the intervention than low achievers, and male low achievers benefitting more than high achievers (Dolan et al., 1993). The GBG appeared to have a greater impact in reducing aggressive behavior among the more aggressive children (Dolan et al., 1993; Feehan et al., in submission). These results on Cohort I suggest that aggressive behavior is malleable in children and that the GBG intervention works for children at the upper end of the risk continuum.

With respect to concentration problems, the GBG reduced aggressive and shy behaviors in first-grade children regardless of fall concentration level (Rebok et al., in press). Although males in GBG with high concentration problems had higher levels of spring aggression than those without such problems. They also showed the greatest reduction in aggressive behavior from fall to spring as a result of the GBG. A similar pattern was found for peer-rated aggressive behavior for males but not for females.

The Malleability of the Relationship between Achievement and Depression. The association between poor achievement and depressive symptoms and the malleability of this relationship has been a major focus of our analyses and provide a test of a key element of our *life course/social field* framework (Kellam et al., 1994a). Children's self-reports of depressive symptoms over the course of first grade were closely related to school achievement in both cohorts; and their course

and stability over the first year was related to achievement gains in ML. From fall to spring of first grade, children who reported higher levels of depression in both control and intervention classrooms in the fall had much lower achievement gains than non-depressed children. However, those depressed children in cohort I in classrooms with ML scored as well as the non-depressed children in experimental and control conditions. The stability of depression from fall to spring was high among children, however, who did not show appropriate gains in achievement. In the control classrooms, roughly 50% of children gained the 50 points on the California Achievement Test considered appropriate nationally. In the ML classrooms, 70% gained this amount. For the 30% of children not gaining 50 points, however, depression stability was very high compared to those who gained the 50 points. Thus, the more depressed children who did not gain in achievement as much as the other children were at increased risk of depressive symptoms becoming more stable.

Hierarchical Linear Modeling (HLM). HLM has been applied in recent analyses in order to better capture individual variation in development. We have applied several methods of multi-level modeling and summarize the results here in regard to the course and malleability of aggressive behavior. Using the SAS MIXED procedure with teacher ratings of aggressive behavior, we modeled the course and response to the GBG intervention over the first seven years of school. Relevant to Aim 1, the cohort I and II males in control classrooms displayed a significant increase in linear growth in aggressive behavior over this period of elementary school and into middle school. Relevant to Aim 4, in cohort I, but not cohort II, the GBG intervention removed that significant linear increase in aggressive behavior. Girls in the intervention and control groups displayed a similar growth of aggressive behavior, but the GBG had no impact on the growth of aggressive behavior among the girls. We next tested whether the males who were less aggressive in the fall of first grade responded differently to the GBG over grades 1-7 than the more aggressive boys. For boys below the median at baseline, the GBG intervention, relative to the control condition, resulted in a steeper positive linear slope, which was tempered over the last three years by a significant negative quadratic trend downward, indicating improved aggressive behavior. The control group had a significant, but smaller positive linear growth, but no negative quadratic downward trend in aggressive behavior. Although the intervention group starts off more aggressive at baseline, by the 7th grade they appear similar in aggressive behavior to the controls. Dividing the girls at the median of baseline aggression resulted in the finding that those less aggressive and in GBG classrooms had a steeper positive linear slope tempered by a significant negative quadratic trend. The control group had a significant, but smaller positive linear growth, but no negative quadratic downward trend. Turning to the issue of GBG responders and non-responders, we split the sample into those students whose level of aggressive behavior was reduced over the first two years, regardless of whether they were in the intervention or the control conditions. For boys who increased in aggressive behavior over this period, there is a significant positive linear trend and a significant negative quadratic trend across conditions. The intervention boys start at a higher baseline level than control boys. The paths proceed in parallel until the fourth grade when the intervention males tend to show a sharp quadratic reduction. These results did not occur for girls in cohort I or for either gender in cohort II. In pursuing the explanation for the variation in impact of GBG, we explored methods of clustering the children's individual curves to find dominant profiles, and then examined the

profiles for evidence of where the impact of GBG or lack of impact occurred among the types. This analysis produced 5 typical profiles. Comparing the percentages in GBG and controls in each pattern we find the difference in the intervention and control groups appears to be in two of the five curves. These two curves begin in fall of first grade somewhat above the median of aggressive behavior and move toward more aggressive behavior through middle elementary school, with one curve showing a considerable downward trend in the latter half of elementary school and into middle school, while the other profile continues on a worsening course. The GBG children were twice as frequent among those in the curve that improved; and the control children twice as frequent among those who become more aggressive. The other three curves did not show effects of GBG.

We have also applied HLM procedures to study the course of achievement over time as a function of intervention status. The application of growth curve models to the results of the Mastery Learning (ML) trial revealed that ML not only increased the number of children who made the expected reading achievement gain during first grade, but the impact of the intervention held at least until the spring of fifth grade (Crijnen, Feehan & Kellam., submitted). Analyses are now proceeding to study the relationship between these achievement growth curves and potential mediators and moderators. We are particularly interested in analyzing the course of depression over the same period of time (Crijnen, et al., in preparation) and the relationship of achievement curves to the course of depression. We are also interested in examining the course of impact of the ML on achievement and on depression through achievement.

Studying Crossover Effects and Their Longer Term Impact on Affective and Antisocial Disorders. The rationale for the original parallel design involving separate interventions targeting achievement and aggressive behavior centers on the correlation of these important early antecedent risk behaviors and no confirmed explanation for that correlation. The etiological question is whether aggressive behavior is in part the child's response to failure to master the teacher's demand to learn; or whether poor achievement is the consequence of aggressive behavior. Alternatively, they may be related in reciprocal fashion, or linked to a third variable which is causally related to both. Our original design involved testing whether improving achievement altered aggressive behavior or vice versa. The design also allowed us to study whether *cross-over effects*, as we have termed them, occurred from achievement to aggression as well as from aggression to achievement. The results of crossover analyses show that: (1) achievement gain attributable to the ML intervention among males led to significant reduction in teacher's ratings of aggressive behavior; (2) females in the ML classrooms who were higher achieving in the fall and continued to gain in achievement over the year also experienced a sharp decrease in aggressive behavior (aggressive behavior was much lower to begin with); (3) there was no increase in achievement as a consequence of improving aggressive behavior through the GBG among males or females who received the GBG (Kellam et al., in press). These analyses support the hypothesis that improved achievement can lead to reduced aggressive behavior, and are consistent with the hypothesis that aggressive behavior may be partly a response to failing to achieve in first grade, particularly among boys. The results do not support the hypothesis that improving aggression can lead to improved achievement.

Effects of the GBG on the Distal Outcome of Early Initiation of Tobacco Use. Survival analyses revealed that boys in GBG classrooms in both cohorts were at reduced risk at age 14-15 for initiating tobacco use relative to control children (Kellam & Anthony, in preparation). Appendix D illustrates the differences among the intervention conditions within each of the two cohorts. Sixty-percent of males in cohort I control classrooms had initiated smoking by age 14 and over 50% in cohort II. In contrast, the incidence of tobacco smoking in GBG boys was about one-half the rate found in control boys. Girls were not helped by being in GBG or ML in delaying the initiation of tobacco use. Again, this variation in effect was found in both Cohort 1 and Cohort 2, illustrating the variation within and across intervention conditions, gender, and cohorts. It is important to point out that the effect of the GBG on initiating tobacco use appears only as the children reach the age of increased risk for substance use. This suggests that intervention effects may not become apparent until the youth arrives at the life course stage that demands the skills developed during an earlier stage of development. Indeed, in the case of substance use, it may not be until middle or high school that the youth will be required to use the skills learned in the GBG to resist peer pressure to engage in substance use. Both the long-term impact on aggressive behavior in Cohort 1 and the impact on both cohorts support this hypothesis.

3.3.5 Directions for Further Analyses. Our analytic work to date on malleability points to the considerable variation in responses among genders, cohorts, and as a function of baseline characteristics of the child. Our plan is to continue studying variation in response over time as function of not only the characteristics of the child, but of the social fields of the family, classroom, and peer group. The prevailing behavior in the classroom along with aggregate achievement levels are among the contextual influences we will examine along with family characteristics, such as parent discipline and monitoring. Among the questions to be examined in the next stage of our proposed work is how much change in the proximal target is necessary, and how long that change must be maintained, to reduce the risk for untoward SAS and PWB outcomes in adolescence and adulthood.

3.3.6 Related Current and Developing PRC Research Projects. The proposed follow-up study will be strengthened by several funded grants and projects. Information on these projects (including Biostatistical Methods for Measuring the Impact of Preventive Trials, Neuropsychological Measures of Attention, and Periodic Measures of Use of Substances) is summarized in Appendix E.

4. RESEARCH DESIGN AND HYPOTHESES

In the next stage of our work, we will achieve our proposed aims by combining the continued analyses of our existing data sets from Cohorts I and II through age 14-15 with additional data obtained through carefully controlled interviews. As each cohort passes through the ages of 17-18 and 19-20, a team of project interviewers will conduct a standardized interview with each youth and a nominated peer. These interviews will include assessments of psychological well-being (anxious and depressive symptoms and disorder) and social adaptational status (substance use and antisocial behavior and disorders). In addition, we will assess social adaptational performance in the developmentally relevant social fields of the work place and intimate

relations, along with response to the evolving social task demands of the peer, family and classroom social fields. Finally, the mediators and moderators of developmental course in terms of SAS and PWB will also be assessed. These include the evolving characteristics of the individual and the social fields of family, school, peers, intimate relations and work within the broader context of the community. The latter two social fields of intimate relations and work become progressively more salient in late adolescence and early adulthood. The moderating impact of help-seeking and services utilization on developmental outcomes in terms of SAS and PWB will also be examined. The aims of the next five years are briefly elaborated below along with an explanation of how the data from the proposed assessments and the existing data will be used to meet these aims.

4.1.1 Aim 1: Modeling SAS and PWB from Entrance to First Grade through Adolescence and into Early Adulthood. The proposed assessments will enable us to extend our study of the evolving course of SAS from early childhood through adolescence and into early adulthood, when the workplace and intimate social fields and, potentially, the family of procreation, become salient. In line with our *life course/social field* framework we hypothesize that success in meeting the task demands of these new social fields, as well as the evolving demands of the family, peer group and classroom social fields, stems from successes and failures in meeting the social task demands of earlier stages of the life course. Among the specific questions the new data will enable us to answer is the extent to which early as well as later academic achievement, authority acceptance, and social participation relates to success in obtaining and maintaining employment and becoming self-sufficient in terms of income. In turn, we will be able to examine the relationship between success in the work social field and psychological well-being.

We hypothesize that unemployment, and/or under employment, will be associated with poor achievement, concentration problems and aggressive and shy behaviors over the course of childhood and adolescence. More specifically, we hypothesize that those youths who manifest both aggressive and shy behaviors are likely to be rejected by teachers, parents, and mainstream peers (Patterson et al., 1992). As a result they will miss out on the opportunity to learn what Patterson et al. (1992) term social survival skills; that is, the academic and social skills necessary for success in the job social field. Their concentration problems will serve to further disrupt social survival skills, particularly academic achievement and work performance, by reducing on task time and disrupting the encoding of task relevant information into memory (Rebok, Anthony, et al., in press). Ultimately, these youths' shy/aggressive behavior may cause employers to reject them for the same reasons their teachers, parents, and mainstream peers did over the course of childhood and adolescence. Moreover, their poor academic achievement and concentration problems will leave them without the necessary literacy, mathematics and science skills to master the task demands of the work social field. As a result of their failure in the work social field, we hypothesize they will be at greater risk for decrements in their psychological well-being in the form of psychiatric symptoms and disorders. Consistent with Aim 1, we will also test whether later success in the intimate relationship and peer group social fields is tied to the early course of successes and failures in classmates/peer group social fields. Consistent with Patterson et al.'s (1992) model of the development of antisocial and violent behavior over the life span, we would expect that aggressive/rejected first and second graders, who remain aggressive

and rejected over the middle childhood years, may have fewer friends and be less adept in intimate/romantic relationships in late adolescence and early adulthood. Their lack of social skills and coercive behaviors would make them unattractive to main stream peers and potential intimate partners. As a result, they would be at risk for decrements in psychological well-being, particularly depressive symptoms and disorders, that in reciprocal fashion may make them even less attractive to peers and potential intimate partners. A third question we can address are the antecedents as well as the consequences of teenage parenting and school dropout in terms of social adaptational status and psychological well-being as measured through childhood into adolescence and early adulthood. In general, the examination of the relationship between early social adaptation in the classroom and peer group and later success in meeting the social task demands of the high school/college, dating, and work place social fields will inform us as to the nature, duration, and timing of our preventive intervention efforts. Also in line with Aim 1, the collection of additional data at ages 17-18 and 19-20 will allow us to assess the culmination of the evolving relationship between SAS and PWB in the form of psychiatric disorders as well as psychiatric symptoms and socially maladaptive behaviors in late adolescence and early adulthood.

4.1.2 Aim 2: Modeling Developmental Psychopathology from Entrance to First Grade through Adolescence and into Early Adulthood. Consistent with Aim 2, the new data collection will provide incidence and prevalence rates for psychiatric disorders in adolescence and early adulthood based on an epidemiologically defined community sample of adolescents and young adults. Moreover, the two year interval between the proposed interviews will enable us to assess the variation in the incidence and course of psychiatric disorder as a function of the evolving characteristics of the youth and family, work place, peers, intimate relations, classroom and neighborhood social fields. The measurement of depressive, antisocial and substance abuse disorders in adolescence and adulthood is also in keeping with their sharply increased incidence and prevalence during these points in the life course. Indeed, the limited data available on the manifestation of psychiatric disorders over the life course suggests there is a sharp rise in the incidence of conduct disorder, suicides, substance abuse, and major depressive disorder in adolescence and young adulthood. Moreover, by definition antisocial personality disorder is only diagnosed in adults. The measurement of psychiatric disorders in addition to symptoms and behaviors provides a common psychiatric nomenclature with which to communicate our findings. The data on incidence and prevalence rates will also serve to inform the field with respect to potential gender differences in the manifestation of depressive disorders in adolescence and adulthood and the factors associated with those differences. We will also be able to examine the continuity of psychiatric symptoms over time and their evolution into psychiatric disorder. In addition, we will have the opportunity to study the evolving phenomenology and correlates of antisocial behaviors and depressive and anxious symptoms over the course of childhood and adolescence. As illustrated in Ialongo et al. (1993) and Crijnen et al. (in preparation), among the questions of interest are whether the cognitive features of depressive and anxious symptoms become more apparent over time and whether the strength of the relationship between adaptation to various social task demands varies over the life course and by gender. For instance, is perceived competence in the peer social field more strongly linked to psychological well-being in adolescence and early adulthood than in the pre-adolescent years?

Moreover, we will examine whether cumulative failures in multiple social fields over stages of life increase the risk of affective symptoms and disorders. In line with Turner & Lloyd (in press), we hypothesize that the growth of depressive symptoms will be accelerated in those children and youths whose social adaptational course is marked by enduring failures in multiple social fields.

Consistent with Gotlib, Lewinsohn, & Sealy (1995), the measurement of psychiatric symptoms and disorders at ages 17-18 and 19-20 enables us to study the extent to which the DSM-III-r symptom cutoff criteria validly discriminate between those with and without disorder in terms of impairment in social adaptational status. The new data will also allow us to determine the extent which antisocial behaviors and depressive and anxious symptoms, respectively, covary in conformity with the DSM-IV definitions of affective and antisocial behavior disorders. In terms of the comorbidity issue, in line with Caron and Rutter (1992), we will be in a position to determine whether the impact of depression on SAS is affected by the presence or absence of anxious symptoms and disorders. We will also be able to determine whether the pattern of comorbidity between anxiety and depression represents a meaningful syndrome.

We will also study the issue of the emergence of gender differences in depression--an issue that our longitudinal, prospective design leaves us in a relatively unique position to study (Nolen-Hoeksema & Girgus, 1994). Moreover, our developmental epidemiologic design will allow us to determine whether such differences are in fact real and not a function of samples of convenience and the inherent biases associated with such samples. The data would also allow us to test the three models identified by Nolen-Hoeksema & Girgus (1994) of how gender differences in depression might develop in early adolescence. In addition, consistent with Turner and Avison (1989), these data will also allow us to test the "cost of caring" hypothesis regarding gender differences in depression. According to the cost of caring hypothesis, depression is more prevalent amongst women because they are more likely than men to be distressed by life events experienced by intimate others as well as by themselves.

4.1.3 Aim 3: Modeling Mediation and Moderation of SAS and PWB from Entrance to First Grade through Adolescence and into Early Adulthood. The new data will allow us to understand the child, family, classroom, peer and neighborhood factors that might come to mediate or moderate the relationship between early and later social adaptational status and psychological well-being. These mediating and moderating factors include the initial and evolving characteristics of the youth in terms of their social adaptational status and psychological well-being, and the characteristics of the social fields, themselves, the peer group, family, and neighborhood. In terms of the development of antisocial behavior disorders in adolescence and early adulthood, we plan to model the growth of conduct problems over time and their evolution into psychiatric disorder as a function of a number of factors. These include peer rejection, poor achievement, exposure to deviant peers in the classroom and neighborhood, parental monitoring, and the various family characteristics that may come to disrupt parental discipline and monitoring. Consistent with Conger, Ge, Elder, Lorenz, & Simons (1994), we hypothesize the most rapid growth trajectory into antisocial behavior disorders and heavy drug use will be associated with peer rejection, shy/aggressive behavior, and poor achievement during childhood. The growth of antisocial behavior will also be enhanced by poor parental monitoring, exposure

to deviant peers, and continued poor achievement and shy/aggressive behaviors in the adolescent years. Moreover, we hypothesize that parental monitoring will be disrupted in multiplicative fashion by a range of family risk factors, such as, single parenthood, financial distress, parent mental health and life events.

The additional data collection at ages 17-18 and 19-20 will also allow us to understand the mechanisms associated with late onset of conduct problems and delinquency. In line with Patterson et al. (1992), we hypothesize that late onset of conduct problems, and ultimately disorders, is the product of the confluence of a number of factors: disruptions in parental monitoring, marginal adaptation to the social task demands of authority acceptance, social participation, and achievement in childhood, and exposure to deviant peers. More specifically, we hypothesize that chronic disruptions in parent monitoring and discipline practices during the early adolescent years play a central role in the late manifestation of conduct problems and delinquent behavior. These disruptors may include a divorce, serious financial distress associated with the loss of a job and the inability to find work, and the late onset of parental mental or physical disorder. We also hypothesize that these late onset youths were not problem free during childhood, rather their performance in meeting the social task demands of authority acceptance and achievement during childhood was marginal. Furthermore, it is hypothesized that these late onset youths have been exposed to deviant peers.

4.1.4 Aim 4: Modeling Malleability of Developmental Paths from Entrance to First Grade through Adolescence and into Early Adulthood. The purpose of Aim 4 is to model the developmental courses of individuals who vary in their responses to the early interventions. We will explicitly test whether the developmental models elaborated under Aims 1-3 explain variation in response to the interventions and subsequent course. In general, we hypothesize that the impact of each intervention on its distal SAS and PWB outcomes in late adolescence and early adulthood will be a function of the amount and stability of change induced in the proximal target and the salience of the proximal target to the individual. We hypothesized in Aim 1, for example, that poor achievement is reciprocally linked to depressive symptoms and eventually to disorder. In Aim 4 we further hypothesize that the intervention aimed at poor achievement (ML) will vary in its impact, with only those individuals responding to increased achievement with improved depression who showed earlier linkage of these SAS and PWB variables. We further hypothesize that these individuals will be ones whose risk of depression is dependent on self-perceptions of competence and mastery. For some individuals there may be a delay in the development of the salience of failure and its link to depression. Based on theory and our earlier results we hypothesize that those individuals who become aware of the importance of poor achievement to their lives at a later point in the life course will become more vulnerable to depressive symptoms and disorders as a result. This may account for some individuals not responding to intervention immediately but rather later. There may also be individuals whose risk of depression is not related to mastery and remains unrelated over the life course. These individuals will not improve their risk of depression through interventions inducing mastery, even if mastery is itself improved. With respect to the GBG intervention, we hypothesize that we can identify sub-groups of children that vary in their response as a function of variation in parental monitoring and discipline. For example, inconsistent discipline and poor parental

monitoring may result in attenuation of the GBG impact in the middle school years, thus increasing the risk for conduct disorder, substance abuse, and antisocial personality disorder in adolescence and adulthood (Chilcoat et al, 1995).

5. METHODS

5.1 Procedures

As indicated above, we will achieve our aims by combining the continued analyses of our existing data sets from Cohorts I and II through grade 9 (ages 14-15) with additional data obtained through face-to-face interviews. As each cohort passes through the ages of 17-18 and 19-20, a team of project interviewers will conduct a standardized interview with each youth and a nominated peer. These interviews will be conducted in a private location within the household, as was done for the NIMH Epidemiologic Catchment Area study in Baltimore. Home interviews will be conducted with all consenting youths within a 90-mile radius of Baltimore. For those youths outside this radius, phone interviews will be conducted. Section 5.3.2 and 5.3.3 describe sampling and tracing procedures. To insure the equivalence of the telephone and face to face interviews in terms of reliability and validity, we will pilot both the telephone and face to face interviews with a random sample of respondents in counter balanced order over a two week period. These assessments will be incorporated into our standard pilot efforts to assess the acceptability, cultural sensitivity, reliability, and validity of our methods and measures. In the unlikely event the telephone interview proves unreliable, we will allot resources to carry out face to face interviews with a random stratified subsample of youths. Stratification would be based on the baseline aggression and poor achievement characteristics of the youths. Given previous evidence that survey non-respondents have higher rates of psychiatric disorders than respondents, a supplemental non-response survey will be carried out in parallel with the main survey. a random stratified sample of initial non-respondents will be offered a significantly higher financial incentive to complete the interview.

5.2 Measures

5.2.1 The Existing Data Set: Periodic Assessments in Grades One through Nine of SAS and PWB and the Characteristics of the Youth and the Social Fields of Classroom, Peer Group, Family and Neighborhood and Community. Table 1 depicts the core child and environmental constructs assessed from first through ninth grade by method and frequency. These constructs represent the SAS and PWB outcomes of interest as well as their hypothesized mediators and moderators in terms of the characteristics of the youth and the social fields of the classroom, peer group, family, and neighborhood/community. Table 2 lists the instruments employed, when they were administered, and their psychometric properties. Teacher and parent ratings, school records (including standardized achievement scores), peer nominations, behavior observations and child self-report were used to measure SAS. The teacher ratings are available from first through ninth grade, whereas we have continuing access to school records through graduation or dropout. The child self-reports of social adaptational status in the form of aggressive and antisocial behavior and substance use are available from third through ninth grade along with perceived competence in the academic, social, and behavioral domains. Parent ratings, peer nominations, and child self-

reports of feelings were used to measure PWB. The child self-report measures of anxious and depressive symptoms are available from first through ninth grade, whereas parent ratings are available in fourth and sixth grade. As can be seen in Table 1, we used multiple methods of measuring each core construct (aggressive behavior, shy behavior, concentration, learning, classmate relationships, and depression and anxiety).

5.2.2 Overview of Proposed Assessments at Ages 17-18 and 19-20. The youth interviews will be completed within 90 minutes, a duration found acceptable in the NIMH Epidemiologic Catchment Area studies of the eastern Baltimore population (Eaton & Kessler, 1985). The peer interview will be approximately 30 minutes in length and be conducted over the phone. Information about school suspensions and expulsions and court adjudications will be obtained from archival school and juvenile and adult court records. Information about job performance will be obtained from the youth, and the peer. Characteristics of the neighborhood and community will be obtained by way of youth self-report and census data.

Psychological Well-Being and Social Adaptational Status in the Social Fields of Family, School, Peer Group, Intimate Relations, and Work: Youth Self-Report. The face-to-face youth interview will contain a set of measures which provide comprehensive coverage of the SAS and PWB outcomes of interest. In terms of PWB, these include depressive and anxious symptoms and disorders. With respect to social adaptational status, substance abuse and antisocial behavior disorders will be assessed along with self-perceptions of social adaptational status in the family, school, peer, work and intimate relations social fields. The symptom level measure (Baltimore How I Feel, described below) of psychological-well being has been utilized since first grade, whereas the measure of antisocial behavior and conduct problems has been used since third grade. The youth interview also provides coverage of the hypothesized mediators and moderators of PWB and SAS outcomes. With respect to antisocial behavior and disorders and academic achievement, the relevant mediating and moderating constructs to be assessed in the youth interview include: 1) parental monitoring, discipline, reinforcement, rejection, problem solving, and involvement in learning and behavior, and 2) exposure to deviant peers and neighborhoods. Each of these measures has been used since third grade. The measurement of these constructs is consistent with reviews by Patterson & Stouthamer-Loeber (1985) and others (Loeber & Dishion, 1983; Rutter & Giller, 1983), as well as our own work (Chilcoat et al., 1995; Chilcoat & Anthony, submitted; Poduska et al., in preparation; Ialongo et al. in preparation), suggesting there is substantial evidence of a link between family management skills, exposure to deviant peers and neighborhoods, and child antisocial behavior and poor achievement.

The mediators and moderators to be assessed most relevant to the risk of affective symptoms and disorder include: 1) adolescents' attributions for success and failure, 2) the saliency of various domains of adaptive functioning to an adolescent's perceived self-worth, 3) perception of social adaptational status in the developmentally relevant realms of physical attractiveness, intimate relationships, and close peer relationships, 4) the fateful life events the adolescent may have experienced, and 5) the adolescent's perceptions of the social support available to them to help cope with normative and nonnormative life events. The youth's perception of competence in the peer and school social fields have been assessed since third grade. Additional moderator

variables to be assessed in the youth interview include (1) child health services utilization, (2) youth and family physical health, (3) parent mental health, (4) family and youth life events, and (5) family structure and demographics, including income, the youth and his parents' education, occupation, and employment status. Given that the majority of children will be between 17 and 18 years of age in 1996, the accuracy of the information they provide should be quite satisfactory. Moreover, Edelbrock et al.'s (1985) findings suggest that youths in this age range provide highly reliable reports of psychiatric symptoms and disorders.

Facilitating Recall of Life/Transitions Events: The Life History Calendar (LHC) (Freedman, Thornton, Camburn, Alwin, and Young-DeMarco, 1988). Prospective longitudinal designs are generally strong in assessing for current life circumstances at each assessment, but are often poor at assessing change in circumstances between assessment periods. In such instances, absolute change can be determined by contrasting the data at two time points, but a retrospective method is needed to accurately determine data on the timing, duration, sequencing and co-occurrence of transitions and life events. In the present study we will use the LHC to assess for changes in circumstances between assessment periods, as well as to facilitate recall of relevant transitions events and family characteristics in early adolescence. Among the events to be assessed using the LHC are leaving school, gaining employment, moving on to other educational institutions, leaving the parental home, and beginning dating and forming intimate relationships, becoming pregnant or fathering a child, and becoming a parent. The LHC has recently been used in the age 21 follow-up of the Dunedin study to determine the incidence and monthly timing of events between the 15 and 21st birthdays (Caspi et al, in submission). Test re-test reliability for the LHC after five years ranges from 90-100% concordance for marital and school history and 70-85% for employment history. The reliability is particularly high for those who experienced a period of unemployment (Freedman, 1988; Lyketsos, 1994).

Social Adaptational Status in the Social Fields of the Family, School, Peers, Intimate Relations, and Work: Peer as Rater. As part of our interview of the youth, s/he will be asked to identify two peers who "know you very well," one of whom will be randomly chosen to be interviewed. Peers will provide information on a modified version of items I-VII of the Youth Self-Report and Profile (Achenbach & Edelbrock, 1987). These items will parallel those used with the youth and provide us with a means of measuring the youth's performance in the peer and intimate relations social fields as reported by natural raters in those social fields. In addition, we will ask peers to report on the target youth's academic performance, competence in the work social field, and response to authority figures--parents, teachers, and work supervisors.

School, Police and Court Records as Indicators of the Youth's Social Adaptational Status in the Classroom Social Field, Service Utilization, and Characteristics of the Classroom, School, and Family Social Fields. In addition to the youth and peer interviews, school records including attendance, report card, standardized test scores, disciplinary removals and suspensions (and the associated offenses), special education services received, free lunch status, and personal information will continue to be obtained by hand or magnetic data file transfer, both with error and reliability checks. Personal data include vital statistics such as gender and birthdate, as well as legal guardianship (if any), prior school experience, and pertinent addresses and phone

numbers. The report card data include grades for academic subjects, as well as ratings of work study habits and independence. Police and court records will also be obtained to determine the frequency and nature of police contacts and criminal convictions (see Appendix F for letter of support from Juvenile Court).

Characteristics of the Neighborhood and Community Social Fields as Modifiers of the Course of SAS and PWB. Census Bureau data and police and school records will continue to be used to derive salient ecological variables. As noted earlier, the working assumption behind this domain of variables is that there can exist broad ecological variables (e.g., deviant peers) that vary for the youths participating in the preventive trials which may modify their developmental course and the effect of the interventions on SAS and PWB outcomes. Currently, we possess census data and crime records for the City of Baltimore, which we have used to derive salient ecological variables at levels of analyses ranging from the five urban areas to the city block in which a youth resides. At the census tract-level, we have created indices consistent with those developed for the Health Demographic Profile system (Goldsmith, Lee, & Rosen, 1984), such as residential stability and overcrowding, based on 1990 census information. **5.2.3 Description of Proposed Measures for Data Collection at Ages 17-18 and 19-20**

Measures of SAS: Youth Interview

Youth Self-Report and Profile (YSR) (Achenbach & Edelbrock, 1987). We plan to use the social competence items (I-IV) from the YSR as a measure of the youth's perceptions of their performance in the social relations domain: number of friends and frequency of contact with friends, participation in sports and social activities and organizations, and performance of jobs and chores. The psychometric properties of the social competence scale are described in Achenbach and Edelbrock (1987).

Youth's Dating, Marital, Intimate Relationship History. We will obtain a history of the youth's intimate/romantic relationships, including dating, marriages, divorces, and separations. We will ask the youth to quantify the number of the relationships s/he has been involved in and the length of time involved in these relationships. In terms of dating, we will also ask them to qualify the type of relationships they have been involved in (casually dating, regularly dating, only seeing one person, commitment to marriage). For all intimate relationships reported, we will ask the youth the reasons for terminating the relationships and to characterize each relationship with respect to the frequency of verbal aggression/coercion, physical aggression/threat, and severe aggression. The Life History Calendar described above will be used in obtaining this information.

Youth's Employment History. We plan to obtain from the youth her/his employment history, including number and types of jobs held, reasons for leaving, and rate of pay. The Life History Calendar will also be used in obtaining this information.

Table 1: Constructs, Method and Timing of Assessment First Through Ninth Grade

Constructs	School Records	Teacher Ratings	Classmate Ratings	Self Ratings/ Reports⁽¹⁾	Classroom Observations	Parents⁽²⁾
Child Psychological Well Being - depression - anxiety - self-perception of competence			G1- G2	G1- G9		G4, G5, & G6
Social Adaptational Status - acceptance of authority - social contact - concentration - achievement - attendance - disciplinary removals and suspensions	G1 - G9	G1 - G9	G1 - G2	G3 - G9	G1 & G2	G4 & G6
Special Service - Utilization	G1 - G9	G1 - G9				G4, G5 & G6
Environment						
Classroom	G1 - G9	G1 - G9	G1 - G9	G1 - G9	G1 & G2	
Classmate/Peer Group	G1 - G9	G1 - G9	G1 - G2	G3 - G9	G1 - G2	G4 - G6
Family				G3 ⁽¹⁾ - G9		G4 ⁽²⁾ & G6
Block, Census Tract	G1-G9					

Table 2: Assessment Instruments Employed from First through Ninth Grade

Measure	Constructs Measured	Periodicity of Measure (# Grade)	Psychometric Results (Alpha Coefficients)
1. Teacher Rating (TOCA-R)	Authority Acceptance Social Contact Concentration Peer Rejection Need of and Use of Services and Treatment	G1-G2 = 2 per yr. G3-G9 = 1 per yr.	.85 - .89
2. Classmates Rating	1. Aggression/Disruption 2. Social Contact 3. Peer Acceptance 4. Anxiety & Depression	G1-G2 = 2 per yr.	.74 - .91
3. Direct Observation of Classroom Behavior	1. Aggression/Disruption 2. Social Contact 3. Concentration	G1-G2 = 4 per yr.	.70 - .79
4. Youth Report of Psychological Well-Being	Depression Anxiety	G1-G2 = 2 per yr. G3-G9 = 1 per yr.	.79 - .83 anxiety .80 - .84 depression
5. Youth Report of Social Adaptational Status and Parent Discipline and Monitoring	1. Antisocial/Delinquent Behavior 2. *Substance Use 3. Exposure/Involvement with Deviant Peers 4. Perceived Competence Academic Social Physical Attractiveness 5. Perception of Parents' Discipline, Monitoring, Involvement, Rejection	G3-G9 = 1 per yr. G3-G9 = 1 per yr. G3-G9 = 1 per yr. G3-G9 = 1 per yr.	.67 - .74 .78 - .81 .61 - .67 .64 - .79

6. School Records	<ol style="list-style-type: none"> 1. Grades 2. Attendance 3. Standardized Achievement 4. Special Education 5. Disciplinary Removals Suspensions and Expulsions 6. Free Lunch Status 7. Grade Retention 8. Curricular Track 9. Dropout/Graduation 	G1-G9 = 1 per yr.	
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7. Parent Ratings	<ol style="list-style-type: none"> 1. Social Contact 2. Authority Acceptance 3. Concentration 4. Anxiety 5. Depression 6. Use of Services and Treatment 7. Parent Behavior Management/ Discipline Practices Home Learning Environment Parent and Child Physical Health Family Income 	G4 and G6 = 1 per yr.	.60 - .74 .68 - .80 .75 - .84 .70 - .79 .81 - .83 .61 - .64 .78 - .81
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* Gathered via NIDA grant on substance use.

Baltimore Conduct Problems and Delinquency Scale. Since third grade we have employed an adaptation of a self-report measure of delinquent and antisocial behavior developed by Elliott and Huizinga for National Survey of

Delinquency and Drug Use (Elliott, Huizinga & Ageton, 1985). In fifth grade, the number of items was increased to provide greater coverage of the DSM-III-R criteria for conduct disorder. Cronbach alphas have ranged from .67 to .74 in the middle school years. One year test-retest reliability coefficients have consistently been above .60.

Baltimore Substance Use Scale. Since third grade we (Chilcoat et al., 1995; Chilcoat & Anthony, submitted; Kellam & Anthony, in preparation) have also employed an adaptation of Elliott and Huizinga's measure of substance use, which they developed for use in the National Survey of Delinquency and Drug Use (Elliott, Huizinga & Ageton, 1985). Youth's report on knowledge and use of tobacco, alcohol, marijuana, crack cocaine, heroin, inhalants and stimulants.

Composite International Diagnostic Interview-University of Michigan Version (CIDI-UM). The

CIDI-UM (Kessler et al., 1994) antisocial personality and substance abuse disorder modules will be employed to assess socially maladaptive behavior and disorders.

Diagnostic Interview Schedule for Children (DISC-2.3, Fisher, Wicks, Shaffer, Piacentini, & Lapkin, 1992). Given the CIDI-UM does not include ADHD and Conduct Disorder modules, we will utilize the DISC-2.3-C for this purpose. The measurement of ADHD will allow us to understand the impact of concentration problems and disorders on performance in the social fields of the classroom, peer group and work. Like the CIDI, the DISC-2.3 is a fully structured interview that specifies the exact wording and sequence of questions and provides a complete set of categories for classifying respondents' replies. It is also designed to be administered by lay interviewers. The DISC-3 generates DSM-III-R diagnoses (and provisional DSM-IV diagnoses) as well as the number of diagnostic criteria met and symptom counts for discrete diagnostic entities. A lifetime version of the DISC is currently under development for use in the UNO-CAP study and will be used in our field assessments if it is available.

Measures of SAS: Peer Interview

Modified Social Competence Items from Youth Self-Report and Profile (Achenbach & Edelbrock, 1987). As part of our interview of the youth, the respondent will identify two peers who know him/her very well. Peers will provide information on a modified version of the social competence items (I-VII) of the Youth Self-Report and Profile (Achenbach & Edelbrock, 1987). These items will parallel those used with the youth and provide us a means of measuring the youth's performance in the peer and intimate relations social fields as reported by the natural rater in these social fields. In addition, we will ask peers to report on the target youth's academic performance, competence in the work social field, and response to authority figures--parents, teachers, and work supervisors--using YSR items V-VII.

Close Friendship Characteristics Scale (CFCS, Windle, 1994). The identified peer will be asked to characterize the target youth's behavior toward them along four friendship/intimate relationship dimensions--two of which are positive--Reciprocity of Relations and Self-Disclosure--and two of which are negative--Overt and Covert Hostility. The importance of these four dimensions is reflected in the finding that youths' who are rated high on the positive dimensions and low on the negative dimensions are rated as more likeable and popular by their peers (Cooper & Grotevant, 1987). Consequently, these dimensions can be conceived as social tasks demands of the peer/intimate relations social field. Windle (1994) reports adequate internal consistency coefficients and test-retest reliability for each of subscales based on a study of an urban, adolescent population.

Measure of PWB (Psychiatric Symptoms and Disorders): Youth Interview

Baltimore How I Feel. The BHIF is a 40-item, youth self-report scale of depressive and anxious symptoms. It has been used as a first-stage measure of psychological well-being over the course of the study. Children report the frequency of depressive and anxious symptoms over the last two weeks on a four-point scale: "never," "once in a while," "sometimes," and "most times." Items were keyed for the most part to DSM-III-R criteria for major depression, and overanxious and

separation anxiety disorders. A pool of items was drawn from existing child self-report measures, including the Children's Depression Inventory (Kovacs, 1983), the Depression Self-Rating Scale (Asarnow & Carlson, 1985), the Hopelessness Scale for Children (Kazdin, Rodgers, & Colbus, 1986) and the Revised-Children's Manifest Anxiety Scale (Reynolds & Richmond, 1985). The remaining items were developed by an expert panel of judges consisting of two child psychiatrists and two clinical psychologists. The Cronbach alphas for the depression and anxiety items have been between .79 and .85 over the course of the study. Two-week test-retest reliability coefficients have ranged from .60 in first grade to .70 in middle school.

Composite International Diagnostic Interview-University of Michigan Version (CIDI-UM). The CIDI-UM (Kessler, McGonagle, Zhao, Nelson, Hughes, Eshleman, Wittchen, & Kendler, 1994) anxious and depressive disorder modules will be used to measure psychological well-being as reported by the youth. The CIDI-UM is a fully structured psychiatric interview, based on the Diagnostic Interview Survey (Robins, Helzer, Croughan, & Ratcliff, 1981), that specifies the exact wording and sequence of questions and provides a complete set of categories for classifying respondents' replies. The highly structured format is intended to minimize clinical judgement in eliciting diagnostic information and recording responses. It is designed to be administered by lay interviewers, trained to follow precisely the interview schedule. The CIDI-UM generates lifetime and 12 month DSM-III-R and ICD-10 diagnoses as well as the number of diagnostic criteria met and symptom counts for discrete diagnostic entities. The original CIDI was revised by Kessler and his colleagues for use in the congressionally mandated National Comorbidity Study. Although designed to be used with adults, Kessler revised the instrument for use with youths as young as 15. He and his colleagues also added commitment and motivation probes for recall of lifetime episodes. Kessler and his colleagues are currently developing assessment procedures to handle the tendency of the respondent to report fewer symptoms and disorders after repeated interviews over a relatively short interval of time. One such procedure is to remind the individual of the psychopathology previously reported. Upon consulting with Kessler, we will employ these new procedures once they have been formalized and field tested.

Measures of Mediators and Moderators of SAS and PWB: Youth and Peer Interview

The use of the first six scales described below will be most relevant to modeling the factors associated with onset of psychiatric disorders (particularly depressive disorders) during the interval between the age 17 and 19-20 assessments.

How Important Are These to How You Feel about Yourself as a Person? (Harter, 1985, 1988). The purpose of this instrument is to determine the saliency of a particular domain to the child's global self-worth, which is a central feature of our developmental epidemiologic model of depression. Harter developed this instrument to complement the Self-Perception Profile for Adolescents. The item format is similar to that of the self-perception profiles. For each item the adolescent is presented with a description of two groups of adolescent, one of which is described as perceiving a particular domain to be important to their self-worth (e.g., Scholastic Competence), whereas the other group does not. After the adolescents select the group most like them, they are asked to refine their choice further by deciding whether it is "sort of true for me"

or "really true for me." Hence scores for individual items range from 1-4, with high scores indicating greater perceived importance.

Attributional Style Questionnaire (ASQ). The ASQ (Seligman, Abramson, Semmel, & Van Baeyer, 1979) assesses subjects' causal attributions for important outcomes. It will be used to test our hypothesis that the relationship between SAS and PWB is mediated in part by the youth's explanatory style. It is a 48-item forced choice measure. Subjects identify the major cause of 12 hypothetical situations and then rate each cause for degree of internality, stability, globality, and importance. Seligman et al. (1979) found significant correlations between specific attributional dimensions and level of depression. Peterson, Semmel, von Baeyer, Abramson, Metalsky, & Seligman (1982) reported alpha coefficients of .75 and .72 for the composite scale scores for positive and negative outcomes, respectively. They also report 5-week test-retest correlations of .70 and .64, respectively. Artanz, Gerlsma, & Albersnagel (1985) report that some adolescents may have difficulty in understanding the ASQ. As an alternative, Saylor et al. (1984) suggest use of the Child Attributional Style Questionnaire (Kaslow, Tannenbaum, & Seligman, 1978). We will pilot test both instruments to determine which is the most psychometrically sound for our population. *The Multidimensional Measure of Adolescent's Perceptions of Control (MMAPC, Wellborn & Connell, 1987)*. The MMAPC is an upward extension of the Multidimensional Measure of Children's Perception of Control (Connell, 1985). Perceived control and expectations about whether one can influence success and failure in the academic, work, and interpersonal relations domains are assessed. Internal consistency for each of the subscales is in the .90s (Wellborn & Connell, 1987). The reliability and validity of the scale has been established with urban, African-American middle and high school populations. Perceived lack of control over important outcomes is central to our model of depression.

The Life Events Questionnaire (LEQ-A; adapted from Coddington, 1972). The LEQ is a 25-item checklist of life events that is designed for use with adolescents. Eighteen of the events are major negative life events, such as "Your parents got divorced" and "A grandparent died." A modified version of the LEQ will be used that includes only major life events of a nonnormative nature and those that are not confounded with the youth's adaptation to developmental task demands, such as getting along with parents or friends. Items relevant to a family member or parent's loss of job, or a family member's alcohol, drug or mental health problems will be included. In addition, we will include items that will allow us to test the "cost of caring" hypothesis regarding gender differences in the prevalence of depression (Turner & Avison, 1989). That is, we will ask the youth whether, in addition to themselves and family members, had any of their friends experienced the life events included in the checklist. Consistent with our developmental epidemiologic model of depression, the data on fateful life events will allow us to test the hypothesis that such events may interfere with the youth's ability to meet social task demands, which, in turn, may increase the likelihood of decrements in psychological well-being.

The Arizona Social Support Interview Schedule (Barrea, 1981). Social support from parents and peers will be assessed with the ASSIS, a structured interview that is designed to assess the availability of and satisfaction with social support network resources. In our developmental epidemiologic model of depression, social support may serve to buffer the youth from

decrements in PWB in the face of failures in the main social fields. Respondents are asked to name people who are perceived to be providers of six categories of support including intimate interaction, material aid, advice and information, positive feedback, physical assistance, and social participation. The ASSIS also contains questions concerning subjects' satisfaction with network members during the past month as rated on 7-point scales from 1 (very dissatisfied) to 7 (very satisfied).

Self-Perception Profile for Adolescents (Harter, 1988). This self-report instrument is an upward extension of the Self-Perception Profile for Children (Harter, 1985), of which the Scholastic Competence and Social Acceptance subscales have been used from grades 3 to 9. In the adolescent version, the age relevant domains of Job Competence, Romantic Appeal, and Close Friendship have been added to the domains of Scholastic Competence, Social Acceptance, Athletic Competence, Physical Appearance, and Behavioral Conduct. As in the 8 to 12 year old version, six items are designed to measure each of the domains and a ninth subscale, global self-worth, is also included. The item format parallels that of the younger age version. Internal consistency of the subscales ranges from 0.74 (Job Competence subscale) to .86 (on the Athletic Competence subscale) (Harter, 1988). Perceived competence is viewed in our developmental epidemiological model of depression as a mediator of the relationship between SAS and PWB.

Structured Interview of Parent Management Skills and Practices--Youth Version (Patterson, 1982). This interview was developed by Patterson and his colleagues as a counterpart to their parent interview. We have used this scale since third grade as part of our annual youth interviews. The youth version assesses the parenting constructs integral to the Patterson et al. (1992) model of the development of antisocial behavior and social survival skills (including academic achievement) in children and adolescents. The relevant mediating constructs assessed are: parental monitoring, discipline, reinforcement, rejection, problem solving, and involvement in learning and behavior. *Exposure to Deviant Peers* (Capaldi & Patterson, 1989). As elaborated earlier, Patterson et al. (1992) and colleagues have theorized that drift into a deviant peer group increases the risk for antisocial behavior. They argue that antisocial behavior is not only modeled but reinforced by the deviant peers. Since third grade, we have used Capaldi and Patterson's (1989) 6-item self-report scale to assess this construct along with additional items assessing the impact of deviant siblings. Youths are asked in forced choice format to indicate how often their peers and/or siblings have engaged in antisocial behavior and whether their peers and/or siblings have encouraged them to participate in such behavior. Coefficient alphas have ranged from .78 to .81 in middle school.

Neighborhood Environment Scale (NES, Elliott, Huizinga, & Ageton, 1985). The NES consists of 18 true-false items and will be used to assess exposure to deviant behavior in the neighborhood, including violent crime and drug use and sale. The NES also has been used since third grade. Crum and Anthony (1993) report Prevention Center youths living in neighborhoods in the highest tertile of crime and drug use, as measured on the NES, were 3.8 times more likely to have been offered cocaine than youths in the lowest tertile. Coefficient alphas have been above .80 throughout middle school.

National Health Interview Survey (Health Interview Survey-1, 1988, Short Form). The HIs interviews have been developed for use in the ongoing nationwide, HANES studies of adult and child health status, practices, and service utilization. It will allow us to model how the youth's physical health and the physical health of family members impact on SAS and PWB.

Service Use and Risk Factors (SURF) Interview. The SURF is a structured interview developed for the NIMH collaborative MECA study (Goodman et al., 1991) to obtain information in a number of domains including past and present use of mental health, health, and educational services and barriers to service utilization. In the proposed study, only the Services Utilization and Barriers module will be utilized. The information obtained in these modules includes the youth's primary source of health care, use of mental health services, and barriers to the use of these services.

5.3 The Population

5.3.1 Defining the original study population. Beginning in 1985, two successive cohorts ($N_I=1196$; $N_{II}=1115$) of urban first-graders were recruited from 43 classrooms in 19 elementary schools located in 5 socio-demographically distinct areas in eastern Baltimore. With regard to the gender, ethnicity, and age of the subject population at entrance into the study, in Cohort I, 49.1% were male, 65.6% were African-American, 31.6% were Euro-American, 0.3% Asian, 1.0% Native American, 0.3% Hispanic, and for 1.2% of the children, ethnicity was either missing or refused. At first grade, the mean age was 6.55 years ($SD \pm 0.48$). In Cohort II, 50% were male, 65% were African-American, 34% were Euro-American, 0.36% were Hispanic, 0.36% Asian American, and 0.36% Native American. At the time of the first grade assessments, the average age of the child was 6.48 years ($SD \pm 0.39$). Chi-square analyses revealed that refusal rates in Cohort I varied as a function of geographic area [$X^2(16, N = 1,1196) = 43.67, p = .0002$]. The highest rates of parent refusals were in Areas 1 and 4, which are made up primarily of middle income, two parent families, living in well maintained row or detached homes. As with Cohort I, Cohort II refusal rates varied as a function of geographic area [$X^2(16, N = 1,115) = 43.77, p = .0002$] with the highest rates of refusals in Areas 1 and 4.

Table 3 summarizes the project history of Cohort I and II members from recruitment (1985 or 1986) to the onset of the 1993-1994 academic year. Table 3A reports the numbers of cohort members enrolled in BCPS and contributing data at each scheduled measurement. Also reported are the numbers of students departing BCPS (or transferring to non-project schools) and thus not available thus far for data collection. Of those departing, a few re-enrolled in project schools and thus were included in subsequent measurements. Table 3B reports comparable information about the subset of Cohort I who completed at least one year in their assigned condition (96% of whom completed a second year). Tables 3C and 3D provide identical information for Cohort II.

5.3.2 Tracking and Retaining the Population into Adulthood. Of the 1196 Cohort I students, 1084 (91%) were available for data collection at baseline in the Fall of 1985. Of these 1084, 871 (80%) remained enrolled in project schools through grade 1; 96% of the 871 completed the second year of their assigned intervention or control. Of the 835 receiving the entire 2 year intervention, 71% (593) remained enrolled in BCPS through grade 9. In Cohort II, 910 of 1115

(82%) were available for data collection at baseline. Of these 910, 96% (878) completed two years in their respective assigned intervention or control conditions; 579 of these (70%) remained enrolled in BCPS through the 1993-1994 academic year. Departure from BCPS or transfer from a project to non-project school was unrelated to assigned condition initially and from grade 1 through the 1993-1994 academic year. Of the 2311 children originally enrolled in Cohorts I and II, 1431 remained enrolled in BCPS at the end of the 1993-1994 year. Of the 880 who have departed the system, cooperative agreements with surrounding communities, supported by the Baltimore City and County schools computerized tracking systems, provide a solid basis for our estimate that more than 80% of these (i.e., 704) will be located within a 90-mile radius of the Prevention Research Center. Examination of school records for all children originally enrolled along with existing and to-be-collected data represents a uniquely complete and comprehensive data set. A recent study of those children remaining enrolled in Baltimore City and in Baltimore County confirmed the completeness of this data source for such information as current grade level, special education services, disciplinary actions, grades, and standardized tests scores. Fully 83% of those students agreed to and completed our annual youth self-report interview, which will be administered in the proposed research along with measures of psychiatric disorder. For these reasons, we are confident in our capacity to locate, recruit, and complete data collection on at least 80% of the original 2311 students enrolled originally in Cohort I and II.

5.3.3 Efforts to Trace Youths Who Drop Out of School. The efforts to locate and interview cohort members who drop out of school will involve the systematic and multiple search strategies used successfully by Drs. Ensminger and colleagues (including Kellam) in their age 32 follow-up of the Woodlawn cohorts. Over 80% of the participants were located and interviewed 16 years after their last interview in Woodlawn. These successful strategies will be carried out in hierarchical fashion. A major tool for the periodic follow-up continues to be the Baltimore City Public Schools information system with its unique identifier for each child (encrypted by us for confidentiality). The system enables tracking children over time and across schools throughout their schooling in Baltimore and contains last known addresses and transfer information along with student status. Thus, we would search school records in Baltimore City as well as the surrounding counties for the last known address of the youth. These records include parents' names, addresses, and phone numbers along with whether the youth has dropped out, or transferred. In the event of a transfer, the address to which the school records were sent is also available. For those whom this search proves unsuccessful, we will contact the friends, relatives or employers previously identified by the youth and/or their parents as likely to know their whereabouts if they moved. The next strategy to be employed would involve contacting the post office for a forwarding address, followed by the computer searching of telephone books through Compuserve's PhoneFile. Subsequent strategies would include searching the TransUnion, and Equifax data bases: voter registration files; motor vehicle registrations; the national death index; local cemetery records; U.S. Military records; juvenile court records; Housing Authority records; Baltimore Board of Health records; Head Start enrollment; Department of Vital Statistics records; Department of Social Services records; sorority and fraternity

Table 3: Project History of Cohort I and II Subjects from 1985-1994

A: COHORT 1 - TOTAL SAMPLE RECRUITED

Grade of Cohort	1	2	3	4	5	6	7	8	9
Year	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
Enrolled in BCPS	1196	1120	1058	996	946	890	836	805	763*
Reenrolled in BCPS	0	0	4	5	7	10	7	14	4
Departed from BCPS	76	66	67	57	66	61	45	31	42

*Present throughout all data collection cycles = 768

B: COHORT 1 - STUDENTS COMPLETING INITIAL YEAR IN ASSIGNED CONDITION

Grade of Cohort	1	2	3	4	5	6	7	8	9
Year	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
Enrolled in BCPS	871	835	789	742	709	673	635	615	593*
Reenrolled in BCPS	0	0	3	4	3	7	5	11	8
Departed from BCPS	36	49	51	36	43	43	31	20	22

*Present throughout all data collection cycles = 586

C: COHORT 2 - TOTAL SAMPLE RECRUITED

Grade of Cohort	1	2	3	4	5	6	7	8
Year	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
Enrolled in BCPS	1115	1056	984	928	892	817	759*	702
Reenrolled in BCPS	0	0	2	8	11	6	9	3
Departed from BCPS	59	74	64	47	81	67	48	57

*Present throughout all data collection cycles = 732

D: COHORT 2 - STUDENTS COMPLETING INITIAL YEAR IN ASSIGNED CONDITION

Grade of Cohort	1	2	3	4	5	6	7	8
Year	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
Enrolled in BCPS	910	878	819	769	743	685	640*	615
Reenrolled in BCPS	0	0	0	3	8	6	6	0
Departed from BCPS	32	59	53	34	64	51	45	25

*Present throughout all data collection cycles = 620

membership networks; community organization membership networks (e.g. PTA, churches, LINKS club, NAACP); and junior and local college enrollments. Additional contact efforts will be made through local church bulletins and neighborhood flyers; local radio and cable access channel announcements; contacts with neighbors at previous addresses; and contacts with personnel at neighborhood schools. For outstanding cases, individual case records will be searched for any information suggesting a longstanding contact within or outside the Baltimore community.

6. DATA ANALYSIS

An illustration is presented in Appendix G to elucidate our analytic strategies.

6.1 Development of the Measurement Model and Data Reduction Strategies

Consistent with Anderson and Gerbing (1988), we will employ a two-step approach to the development and testing of our causal models. The first step is the development of the measurement model, which begins with the *a priori* groupings of variables based on theoretical considerations. Our *life course/social field* framework along with the work of Patterson et al. and other relevant theories will be used to guide those groupings. For example, consistent with *life course/social field* theory, manifest variables are grouped into SAS and PWB within social fields, by social task and by natural raters. In line with Patterson et al. (1992), family characteristics and/or events (e.g., family structure, income, parent education and physical and mental health) that are hypothesized to impact negatively on parenting practices will be grouped *a priori* under the label of family stressors/disruptors. Following the *a priori* grouping of variables, the next step in the development of the measurement model includes the reduction of these manifest variables through confirmatory factor analytic procedures, using LISCOMP (Analysis of Linear Structural Relations with a Comprehensive Measurement Model, Muthen, 1984; Muthen, 1987). A major advantage of LISCOMP is that it allows for estimation of the measurement model (as well as the structural equation model) when the metric is at the interval, ordinal, or categorical level and the data are either normally or non-normally distributed. Once the measurement model adequately fits the data, multiple-group analyses can be used next to determine the consistency of the model across males and females. Farrell (1994) provides a framework for evaluating a hierarchy of hypotheses to explore differences between groups, in this case, males and females, in terms of the measurement model: (a) The models have the same form (i.e., the same pattern of fixed and free parameters); (b) the factor loadings are identical across groups; (c) the factor loadings and measurement error variances are identical across groups; and (d) the factor loadings and variances and covariances among measurement errors are identical across groups. Identical parameter estimates will be used for males and females, except where differences are found. Based on our previous work, we expect gender differences in terms of the pattern as well as the size of the factor loadings with respect to the latent construct of aggression. The aggression factor for males will likely include higher loadings for indicators such as steals, physically harms other and other more serious forms of aggression. After the consistency of the measurement model across gender is established, the invariance of the measurement model across time will be examined. Once again our hypotheses as to the changes expected with development will guide the test of measurement invariance. Back to the aggression example, we expect that nature of aggression will change over time such that more serious forms of antisocial behavior will load more highly on the latent variable of aggression over time and that the variance associated with these manifest indicators will also increase with time and development. Consequently, we will seek to test these hypotheses in examining the invariance of the measurement model over time.

6.2 Treatment of Missing Data

Section 5.3.2 summarized our previous success in following up and interviewing the sample of subjects during much of their school years. We estimate that we will be able to locate, recruit, and interview 80% of the 2,311 youths making up the two cohorts. By itself, a 20% loss to follow-up is considered a borderline situation given inferences could be affected by this amount of missing data. This would be particularly true if there was systematic loss to follow-up (Brown,

1993). We have, in fact, found consistent evidence of a small but measurable relationship between missingness due to mobility and absence and on the one hand and to prior ratings of aggressive behavior and achievement on the other. Such differential missingness is common in longitudinal studies spanning this number of years (Brown, 1992). We anticipate that those who exhibit conduct problems and illicit drug use during late adolescence will be somewhat harder to locate than those who are not, and, therefore, we will need to allow for differential attrition in some of our analyses. Specifically, we plan to use the following procedures, starting from the simplest to the more complex. The first approach, which relies on a technical assumption of "missing at random" (Rubin, 1976), will simply use early aggressive behavior and achievement as covariates in our analyses. If these characteristics "determine" later missingness, then any analyses which condition on these variables are fully appropriate (Rubin, 1987; Little and Rubin, 1987). For some analyses we perform, however, we would not want to present all of our analyses conditional on early aggressive behavior and achievement scores, so we will compute unconditional versions of these models where aggressive behavior and achievement scores are not included in the model. Techniques such as the EM algorithm (Dempster, Laird, & Rubin, 1977) can be used to obtain maximum likelihood estimates of the variance covariance matrix which can serve as input into programs such as LISCOMP. Also, many of the hierarchical linear model procedures that we plan to employ will use the equivalent of the EM algorithm to correct for missing data in, for example, models of growth and development.

A second set of procedures that we will use is based on missing data methods specifically developed at University of South Florida for handling nonrandom (nonignorable) missing data (Brown, 1990; Brown & Zhu, 1994). These methods, called protective estimators, allow for adjustments in the usual techniques for missing data to permit the possibility of nonrandom missingness which is likely to be present in such data. We will also use two other methods for dealing with missing data. One involves the application of multiple imputation techniques as outlined in Rubin (1987), which we have successfully applied in repeated measures analyses. The second involves special techniques for handling missing data that are available within LISCOMP. These will be used to handle limitations in our longitudinal data set arising from cost considerations; that is, when we were unable to collect all the measures we wanted to each year. Specifically, the data we have on parenting practices is based on ratings by the youth from grades 3 through 9, but available from the parents only in grades 4 and 6. Clearly, these two time points for parent ratings are extremely timely, but it would have been helpful to have other timepoints as well. While some analyses will use only parent ratings or only youth ratings, there are other analyses we would like to perform which include both parent and child ratings across all the years. Since it would be theoretically possible to have latent variables for parenting practices from grades 3 through 9 which involve indicators of youth and parent ratings, we will consider the data we do have on parent ratings as incomplete; it is observed at two points in time for the entire cohort, but is completely missing at other times. We can, however, apply LISCOMP models longitudinally to these data in such a way that parent ratings are treated as "missing at random" in the longitudinal models at grades other than 4 and 6. If we find that the unique variance of the four child ratings of parent practices remain constant across time, and the factor loadings are also constant, then we would tentatively assume that the measurement error structure and factor loadings related to parent ratings of parenting practices also does not vary

with time. Under such an assumption, we can perform longitudinal analyses which permit corrections for the complete missing parent ratings while still obtaining consistent estimates of the structural parameters. Such techniques generate two major effects on the inferences. First, the variances of our parameter estimates increases when data such as parent ratings are completely missing. Secondly, the robustness of our statistical models decrease when some data are completely missing, as indicated in Brown (1990). Thus our analyses may be more sensitive to incorrect specification of model assumptions. In such cases we will systematically examine whether we have evidence that the model assumptions do not hold.

We have had substantial experience addressing issues with loss of attrition in addressing prevalence of different diagnoses. Both multiple imputation and EM algorithm methods have been used to assess prevalence (Moke, 1993). Our experience with two-stage designs will allow us to obtain prevalence estimates which are corrected for potential bias due to differential attrition among subjects who are more prone to diagnosis.

6.3 Aim 1: Modeling the Evolving Course of SAS and PWB from First Grade through Adolescence and into Early Adulthood and Data Analytic Strategies

The central data analytic strategy we will use in studying the evolving course of SAS and PWB from first grade through early adulthood is one of the variety of multi-level models being developed and applied in the biostatistical and psychometric literature. These models include the Hierarchical Linear Model of Bryk and Raudenbush (1987), the repeated measures mixed model applied by Bock (1989), and variations of these models that combine growth curve modeling with the flexibility of the structural equation modeling (Willett & Sayer, 1994; Muthen, 1991). These models can be viewed as extensions of the random regression models (Gibbons, Hedeker, Waternaux, & Davis, 1988) that have received wide attention in the biostatistical literature in the last few years and can also be viewed as methodological variants of the unbalanced model of classical statistics.

The multi-level models allow us to characterize the varying shapes of the evolving relationship between SAS and PWB over the course of development. We hypothesize that the co-evolving course of SAS and PWB may take a number of forms--improving, constant, worsening, or variable--and that these shapes or forms will predict varying levels of psychological well-being and socially maladaptive behaviors in late adolescence and early adulthood. At the first level, which is the subject level, a curve, usually, a polynomial is fit to the path of the response, depressive symptoms, for example. That curve is a smoothed approximation to the raw data for the youth being examined. At the second stage the variation in the parameter estimates from the first level is modeled as a function of characteristics of the youths. At a third level, the characteristics of classroom could be included in the model to explain the variability of the parameter estimates obtained for the individual youths in the classroom.

We will use the PROC MIXED procedure in SAS, to fit the multi-level models to the evolving course of social adaptational status and psychological well-being from first grade through early adulthood. This procedure allows the variance of the response across categories of critical confounding variables such as gender to vary over time. Thus, we can fit a model with a single

set of curves for both males and females without assuming the genders have the same variation in response. We will fit the data by using a polynomial model at level 1 and then a standard mixed effects model at the higher levels. Our first set of inferences will be estimates and tests of parameters and isolation of patterns in the developmental model of each of the SAS and PWB measures. For example, in the case of standardized measures of achievement and depressive symptoms, we will use multi-level models to characterize the developmental course of the typical youth and to estimate and test the variability about that course.

For each youth, we will have a set of parameter estimates of the slope, intercept and other terms of the polynomial regression, which allow us to model the behavior of the response over time. Each youth will also have a set of coefficients for any time-dependent parameters that are present in the model and a set of residuals reflecting the difference between the actual level on the response and the predicted level given the polynomial fit. To assess the role of achievement in the course of depressive symptoms, achievement can be incorporated as a time variant predictor into the model for depressive symptoms. The size and significance of the coefficient for achievement gives an indication of the role that achievement may play in the development of depressive symptoms. This analysis is conditional, in that it fixes one of the responses and then estimates its impact on the other response. A similar model can be used to test the role of depressive symptoms in the course of achievement. Neither of these comparisons is simultaneous. To capture the simultaneity, we fit a multilevel model to achievement and depressive symptoms. We will characterize the typical developmental pattern, the variance about that pattern, and identify outliers: that is, students who show developmental patterns sharply at odds with the typical pattern. We will identify subgroups that display consistent patterns that differ from the patterns of the remainder of the sample. We will also chart the evolution of the covariance between the SAs and PWB measures.

To test whether the covariance of the measures of SAS and PWB is fairly strong, we will apply a multivariate extension of the multi-level model to estimate and test the development of the correlation and to examine and test for directional causality and reciprocity. We will examine whether students who perform well in terms of early achievement, but then do poorly later, are at higher risk for depressive symptoms than students who achieve poorly throughout the school career. We may find that poor achievement leads to depressive symptoms for some developmental patterns of achievement and not others. We can then ask whether those patterns of achievement that lead to depressive symptoms are affected, in turn, by the pattern of depressive symptoms. Do some developmental patterns of the two variables reinforce each other? To be more specific we will test the hypothesis that failure to learn contributes to depressive symptoms and that depressive symptoms contributes to the failure to learn.

We will extend the multi-level analyses to cross-level analyses in which the relationship among variables at different levels are modeled explicitly. These analyses allow estimation of the effects of variables at one level on variables at another. They also allow direct estimation of the relationships among variables at different levels and the moderating effect of a variable at one level on the relationship among a set of variables at another level (Glick, 1980; Rousseau, 1985; Shinn & Rapkin, 1995). The multilevel or hierarchical model can be extended to a multivariate

model by replacing the univariate likelihood function with a joint likelihood function and applying numerical optimization using the 'S' language of UNIX. We have fit this model to the joint behavior over the 7 years of data collected on aggressive behavior and academic achievement and have shown that the joint model fits the data better than the two marginal likelihood models. This improvement in the quality of fit indicates that there is some relationship between the course of aggressive behavior and achievement over development. We are currently trying to model the nature of this reciprocal relationship.

This analysis will assess the dominant course of these variables particularly during the transitions in social fields and the degree to which the change in each of these variables predicts the change of the other variable in light of the change in the social field. These models and their residuals will also give us insight into the degree and nature of the reciprocal relationship among the two domains, shape of the average, or typical, developmental course of SAS and PWB. Using work developed here at Johns Hopkins, we will relax the assumption of normality and estimate the model by the method of moments, incorporating the notions of Generalized Estimating Equations into the problem.

As a final example in this section, we will examine the interaction of both SAS and PWB on outcomes of major importance in late adolescence and early adulthood. For instance, we will perform separate analyses to predict school dropout and a diagnosis of depression based on CIDI-UM responses, both predicted by the developmental course of depressive symptoms and achievement over time. Because each of these outcomes are dichotomous, standard HLM models are not available to analyze these problems directly. However, we will begin using more exploratory methods, then develop confirmatory methods, which will allow us to model how growth in both depressive symptoms and achievement, and their overlap across time, affect these two outcomes. As a first tool, we will use growth curve modeling to summarize each youth's growth curves for depressive symptoms and achievement into three individual level coefficients, one representing linear (or polynomial) growth in symptoms, one representing linear (or polynomial) growth in achievement, and the last representing the correlation between these two measures across time. With each of these three measures, we will obtain a variance-covariance matrix to account for imprecision in the measures. Finally, we will perform a school level logistic regression model to predict a diagnosis of depression, for example, as a function of these three parameters for each subject. The variance-covariance matrix will be used to adjust for imprecision in these individual estimates much the same way that corrections are made in logistic regression modeling using error-prone predictors. Regarding interpretation of these models, we will focus on the relationship between diagnosis and the correlation of symptoms and achievement across time. Our prediction is that this coefficient will be significantly related to both diagnosis and dropout from school.

6.4 Aim 2: Analytic Strategies for Modeling Developmental Psychopathology from Entrance to First Grade through Adolescence and into Early Adulthood-Analytic Strategies

Among the questions to be examined with respect to Aim 2 is the systematic variation over the

age range of 6 to 20 in the occurrence, sequencing, and factor structure of psychiatric symptoms and socially maladaptive behaviors. Moreover, we will be examining the comorbidity of such symptoms and behaviors over time and their relationship to psychiatric disorder. Analytically, we will begin examining these issues using exploratory methods to assess the changing distribution of scores on each of the symptom and behavior items across time. These exploratory analyses will help identify when the prevalence of specific symptoms begins to change and will then be used to form clusters based on prevalence of symptoms across time. Such data will contribute to understanding the evolving structure of symptoms across time. Secondly, we will describe both the sequencing and actual timing that individual symptoms are elevated; for example, using the 23 depressive symptoms from the youth self-report of feelings measure (administered from childhood through early adolescence), we will generate sequences for each individual youth (with right censoring of any symptoms that have never been elevated), which will be analyzed using cluster techniques. Also, by using the ages at which symptoms begin to develop, we can assess whether the co-occurrence of symptoms among children who develop symptoms early is similar or different than the co-occurrence among children who develop symptoms later in life.

Using factor analytic methods, we will examine whether the loadings and unique variances change over time or whether the latent variables, such as depression and anxiety, show a different relationship across time. We also plan to use latent class analyses to categorize subjects into groupings based on underlying dichotomous classifications of depression and anxiety. For each individual then, we will obtain estimates of the probability of being in these latent states of depression and anxiety for each year. We will then perform secondary analyses of these latent variable classifications across time, thereby examining the co-morbidity of depression and anxiety. Also, similar analyses will allow us to examine different types of aggressive behavior, particularly those involving problems with authority, violent acts, and property crimes.

We will also examine whether individual symptoms have particular salience for both diagnoses and social adaptational success or failure. For example, one item that we anticipate will be predictive of a later diagnosis of depression is the timing of first occurrence of suicidal ideation, an item that routinely appears prominently during puberty. Our prediction is that early incidence, as well as changes in intensity of the item will be predictive of later disorder. However, later incidence may not be as important as early incidence, as measured by the magnitude of regression coefficients of symptom levels at time t , using only the population who has not experienced this symptom up to time $(t-1)$. In our longitudinal models, we will then select among all symptoms a subset which show wide variation in incidence and course, and use these items conjointly to predict diagnoses of depression at either of the two time points from ages 17-18 and 19-20. For these analyses to be useful, we must be able to separate measurement error problems in the items from their predictability; such analyses will require the results of standard factor analyses described above which assess measurement error across time and are likely in addition to require the use of new factor analytic methods that are now being developed at USF by Dr. Brown and his colleagues. These methods permit item reliability to vary as a function of level. For example, for many of the items we examine, reliability is highest at the extreme ends of the scale and lowest in the middle, unlike the usual assumptions of factor analysis.

With respect to the cutpoint issue, using the data from the CIDI at ages 17-18 and 19-20 on major depressive disorder, we will examine the predictive validity of the five symptom requirement for disorder and compare it to other definitions involving a varying number of symptoms and varying numbers within each subdomain of depression (i.e., somatic complaints). Specifically, three general methods will be used to examine competing models that relate this disorder to previous symptom data: linear models (with non-constant variance), generalized additive models which allow for curvilinear relationships, and regression tree models. Acceptance of a linear model would imply that the diagnosis is essentially interpretable as an extension of a dimensional construct associated with depressive symptoms. Acceptance of the tree-based model implies a qualitative difference between those whose symptom scores fall below versus above an empirically determined cut-point. This method is the strongest empirical method to test the validity of the cutoff value used by DSM-IV. In the middle is the generalized additive model which is midway between the other two models. First, then, we will carry out a linear model in S-plus where the number of symptoms on the CIDI is predicted by previous symptomatology. Because of the discreteness in the number of symptoms, we will likely need to use models which do not assume homogeneity of variance (such as Poisson regression type models), and we will use robust variances to account for models that display extra-Poisson variation and the like. Tree-based methods can be also obtained in Splus as can the generalized additive models described above (Hastie & Tibshirani, 1986, 1991; Hastie, 1992; Brown, 1993). These same methods can be used to study the cutpoints for conduct disorder, antisocial personality disorder, and the substance disorders assessed.

6.5 Aims 3 and 4: Modeling Mediation and Moderation and Malleability of Developmental Paths

The analyses relevant to both these aims will focus on estimating and testing antecedents, modifiers, mediators, and contextual factors that influence the variation in the course of SAS and PWB and the course of impact. In examining variation in response to the two preventive trials in terms of change in both the proximal and distal targets, we will make use of at least two analytic strategies. The first involves the multi-level modeling described under Aim 1. Specifically, we will add intervention status as a time invariant predictor of change. We will then examine differences in growth curves for SAS and PWB as a function of intervention status. We will also examine the correlation over time between SAS and PWB. In addition, we will add theoretically relevant mediators and moderators as predictors of variation in impact through adolescence and early adulthood. These may include exposure to deviant peers, stressful life events and poor parent monitoring.

A second strategy involves classifying youths as responders or non-responders to the interventions based on the amount of change in the proximal targets of early aggression and poor achievement over first and second grade. We will then examine the prediction that non-responders to the intervention-- that is, those who failed to show improvements in the proximal targets of poor achievement and/or aggressive and shy behaviors--are less likely to successfully negotiate the increasing social task demands of the intimate relations, work, school, and peer group social fields in adolescence and early adulthood. Non-responders will be compared to

responders to the intervention and to those who improved under control situations. A specific analysis in this regard will involve classifying all subjects by whether they received the MI intervention and whether they improved in reading achievement scores by at least 50 points. The 50 point criterion was used in the past to mark significant advancement in achievement (Kellam, Rebok, Mayer, et. al., 1994). We will then examine variation in impact by intervention and the amount and duration of early improvement in the proximal targets of poor achievement and aggressive and shy behaviors. We then will add a series of mediating and moderating variables to understand their contribution to variation in response. These mediators and moderators include characteristics of the youth, beginning with their baseline level on the proximal target of interest, and characteristics of the prominent social fields (e.g., parent monitoring and exposure to deviant peers as reported by the youth). The analytic strategies employed will include regression and contingency table analysis with more recently developed methods in structural equation modeling, time-to-onset modeling, and multilevel or mixed modeling. Where needed we will extend these models to be more appropriate for the data generated by a randomized community based prevention trial. Relatedly, we have developed a preliminary version of the multivariate multilevel model, generated by coding a routine in the new version of SAS MIXED and then adding numerical optimization in S in a UNIX environment. We applied the model to aggressive behavior and standardized achievement scores, both measured at least once a year through the 7th grade. We have shown that the joint model of the two responses fits each response better than the marginal model which ignores the correlation between SAS and PWB.

6.6 Statistical Power

For the most part, the complexity of the models and the necessity of specifying the alternative hypotheses in full detail preclude us from providing a complete description of our power analyses here. We do, however, present below statistical power for some specific, simple analyses of incidence and prevalence for each gender. Since these outcomes are dichotomous, their power is substantially less than those using continuous scale outcomes, so the numbers we report are conservative bounds on statistical power. Our analyses of power for the more complex effects associated with the growth curve analyses will be based on the methods recently developed by Muthen and colleagues (Muthen and Curran, 1994) for growth curve modeling. We will also rely on our own experience with growth curves and hierarchical linear models, as described in the progress report, in estimating the statistical power.

In logistic analyses which examine the incidence or prevalence of DSM-IV disorders by different risk groups or categorizations of developmental trajectories, we will achieve 80% power at the 5% level for the following situations. In this table we have used sample sizes of approximately 1100 since this number will be approximately the number of subjects in each gender (combining cohorts).

Level	Power	N	Total Prevalence of a Dichotomous Risk Group	Prevalence of Diagnosis	Odds Ratio
5%	80%	1086	50%	10%	1.7
5%	80%	1188	33%	10%	1.7
5%	80%	1120	25%	10%	1.8
5%	80%	1118	50%	5%	2.0
5%	80%	1209	33%	5%	2.0
5%	80%	1052	25%	5%	2.2
5%	80%	1140	50%	2.5%	2.5
5%	80%	1215	33%	2.5%	2.5
5%	80%	1108	25%	2.5%	2.75

With a prevalence of at least 10% for a diagnosis, we have sufficient power to detect modest to moderate effects, ones with odds ratios around 1.7, which in previous Woodlawn analyses have been shown to be about the size of the long-term predictive relationships. Note also, however, that Woodlawn analyses were performed on sample sizes about one-half to one-third the size that we expect to have here.

In more complex analyses, for example the ones with growth curves that we describe, it is more difficult to obtain reasonable power calculations because they require specification of a substantial number of parameters. Bengt Muthen and colleagues of the methodology group supported by NIMH has developed a general procedure for quantifying statistical power in growth curve analyses (Muthen and Curran, 1994), which we have relied on to assess the degree of statistical power in the type of growth curve models that we will use. These results indicate that for our design, which uses up to 9 points in time to develop growth curves, sample sizes of size 1000 have higher than 90% power to detect differences in two equal sized groups, where one group's average linear growth curve is one-half standard deviation higher over the entire period from first to 9th grade. This amount of chance is considered a "small" effect size by most researchers. Thus, we anticipate having enough power to detect small effect sizes in these growth curve and hierarchical linear models.

7. HUMAN SUBJECTS

7.1 IRB review and approval

The Johns Hopkins School of Hygiene and Public Health Committee on Human Volunteers considers our existing human volunteer approval for the work of the original grant to cover the measures, design, and procedures described in this application. As new instruments and measures are added, a continuation-with-change document will be submitted for approval. The Baltimore City Public Schools Health Committee also reviews and has approved the human subjects protection provisions.

7.2 Source of study population and subject requirements

The subjects will be the 2311 youth who were recruited originally in 1985 and 1986. We will also interview each youth and, via phone, a peer identified by the youth. The sample of 2311 youths are 51.5% female, 65% African-American, 34% Euro-American, .3% Latino, .36% Asian-American and .3% American Indian. This research program is based within the Baltimore City Public School System and meets the approval of the Board of School Commissioners as well as the Superintendent of the Baltimore City Public Schools.

The youths represent two cohorts of children who were in first grade in 1985 and in 1986. This follow-up proposal will include field interview assessment of members of both cohorts, when they reach the ages of 17-18 and 19-20. Assessment procedures will involve interviews in person or (for the peer) by phone. All respondents will be reimbursed for their participation. Data will be collected on their progress as students, student self reports of anxiety and depression, and self reports of competence and anti-social behavior. Permission for participation will be obtained from the youth in the form of written informed consent.

7.3 Use of records, tissues, body fluids, etc.

Records to be used for the continued core assessment procedures will continue under an IRB approved protocol. These include attendance, grades, and achievement test scores. No tissue or body fluids are needed.

7.4 Potential risks

The data gathering requirements of the proposed research pose minimal risk to the participants. Given that the interview obtains information on affective and behavioral status, we recognize that we may identify respondents in need of mental health intervention. It has been our practice in the Prevention Research Center to facilitate the provision of services to youth who are found to be in immediate need. In the past, professionals within the school system have been notified of such emergencies when interviews with students, parents, or teachers have suggested suicidality, homicidality, abuse, or neglect. In the proposed research, crisis cases identified during home interviews will be linked to appropriate services within the community. This referral process will be carried out by the Field Interview Supervisor, under the supervision of the licensed clinicians on the research team. Whenever possible, referral to appropriate services will be made directly to the participants. Care will be taken to preserve the confidentiality of all respondents and they will also be informed of the legal limits of the confidentiality assurance given at the start of the

interview. We treat all the study data as sensitive data, removing personal identifiers from hard copy forms and maintaining a secure master list. The data on illegal behavior will be protected by a DHHS Certificate of Confidentiality.

7.5 Potential benefits

This program of research will have manifest benefits to those providing educational and clinical services for children, adolescents and young adults. Specifically, in terms of providing developmental epidemiologic data in late adolescence on the prevalence, course, continuity, and risk factors for psychiatric symptoms and disorder in a segment of the population at elevated risk for disorder which is known to be under-served. In terms of the intervention component of the study, the work to date has been shown to have had a moderate impact on reducing aggression and reading impairment in the study population as a whole, though subgroups of individuals have made marked improvements in these areas through the interventions. The present proposal will provide us with information about the long term stability of those effects, and inform us as to refining intervention design in terms of targeting, staging, assessment, evaluation and implementation, to better address the critical public health problems of mental-ill health, antisocial behavior and substance abuse.

8. VERTEBRATE ANIMALS

N/a

9. CONSULTANT

One consultant will be participating in this study: Elva Edwards, M.S.W.

10. CONSORTIUM ARRANGEMENTS

None

11. LITERATURE CITED

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1. The youth interview included the youth's perceptions of his parents' behavior management practices: discipline, monitoring, problem solving, reinforcement, rejection and involvement in youth's learning and behavior.
2. The parent interview included reports of family structure, child rearing history, entrances and exits, occupation, income, residential history, parent behavior management/discipline practices, home learning environment, parent and child physical health and family income.