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ABSTRACT

This report describes an ongoing longitudinal study in Kauai (Hawaii) begun in 1955, which is following the course of all births to adulthood and assessing the long-term consequences of perinatal complications and adverse child-rearing conditions. Specifically reported is a subset of data on 22 children (diagnosed as having learning disabilities by age 10) who were assessed at birth and again at ages 1, 2, 10, 18, and 32. The individuals with learning disabilities were found to have: (1) a higher proportion of perinatal complications and congenital defects, and poorer ratings by parents and pediatricians at ages 1 and 2; (2) significantly greater involvement between the ages of 10 and 18 with community agencies and special educational services, though only half received special assistance; (3) generally poor outcomes at age 18, with few differences between learning-disabled subjects who received or did not receive special services. However, by age 32, the life course of most subjects had considerably improved, with less than 10 percent having criminal records and/or mental health problems; marriage, divorce, and employment rates similar to those of the cohort as a whole (though 80 percent were employed in semi-skilled jobs); and none on public welfare. Possible protective factors were identified and grouped into four clusters: temperamental characteristics, skills, and values; characteristics and caregiving styles of the parents; presence of supportive adults; and opening of opportunities at major life transitions. (Contains 16 references.) (DB)

# A LONGITUDINAL PERSPECTIVE ON RISK FOR LEARNING DISABILITIES

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Presented at the 30th Annual Conference of the Learning Disabilities Association of America, San Francisco, CA, February 26, 1993.

The theme of this international conference is "30 years of building bridges together." It seems appropriate therefore, to add a longitudinal perspective to the study of lives of learning disabled individuals - a perspective gathered from a multi-disciplinary study which began in 1955 and is still active today.

Beginning in the pre/perinatal period an interdisciplinary team of pediatricians, psychologists, psychiatrists, public health and social workers has monitored the long-term impact of a variety of biological and psychosocial risk factors and protective factors on the development of an entire cohort of multi-racial children, born on the Hawaiian island of Kauai, the westernmost county of the U.S. A. (See transparency with map of Hawaii/Kauai)

The principal goals of our investigation were to (a) document the course of all pregnancies and their outcomes in the entire community from birth until the surviving offspring had reached adulthood, and (b) to assess the long-term consequences of perinatal complications and adverse rearing conditions on the individual's development and adaptation to life.

## A historical perspective

The Kauai Longitudinal Study began at a time when the systematic examination of the development of children exposed to potent biological and psychosocial risk factors was a rarity and there were no federal laws that mandated services for these individuals. In the mid 1950s, when the men and women in this cohort were born, investigators attempted to reconstruct the events that led to school failure, criminal behavior, and mental health problems by studying the history of individuals in whom such problems had already surfaced. This <u>retrospective</u> approach can create the impression that a poor outcome is inevitable if a child has a learning disability and has been exposed to poverty and/or perinatal trauma since it examines only the lives of the casualties, not the survivors.

Thirty years later, when the children of Kauai had reached adulthood, our perspectives had changed. A handful of <u>prospective</u> longitudinal studies in the United States and Europe have now followed infants and young children exposed to pre-, peri-, and post-natal risk factors over extended periods of time. These studies have consistently demonstrated that there are large individual differences among high risk children in response to biological risk factors and chronic adversity in their lives (Anthony & Cohler, 1987; Rutter 1989; Werner, 1990).

Our current understanding of the roots of resilience and factors or mechanisms that protect individuals against the risks associated with developmental handicaps comes from a small, but diverse body of literature generated by persons with different professional perspectives--predominantly psychologists, psychiatrists, and sociologists. Most of our knowledge to date comes from short-term studies in childhood and adolescence; ours is among the few investigations that have extended beyond the second decade of life (Werner & Smith, 1992).

The Kauai Longitudinal Study, now in its fourth decade, provides us with a rare opportunity to examine <u>both</u> risk and recovery in the lives of individuals with learning disabilities who grew up with the odds against them.

I will present to you this morning a sub-set of our longitudinal data on LD children who were assessed at birth, at ages 1, 2, 10, 18, and, most recently, at age 32. I hope to demonstrate to you that the longterm outlook for these individuals, in adulthood, is more positive than one might have anticipated from their performance and behavior during their school years. I will then discuss the implications of our findings for future research and intervention - with an emphasis on a life-span perspective.

First, let me describe briefly the children and the way we went about assessing their development. (See transparencies for data base)

<u>Methods:</u> (See transparency)

Early in the study, public health nurses recorded the reproductive histories of the women on Kauai who were to give birth in 1955 and interviewed them in each trimester of pregnancy, noting any exposure to physical or emotional trauma. Local physicians monitored any complications that occurred during the prenatal, labor, delivery, and neonatal periods. A clinical rating ("pre/perinatal stress score"), based on the presence of conditions thought to have a possible deleterious effect on the fetus or newborn infant was assigned to each child ranging from mild (1) to moderate (2) to severe (3).

In the postpartum period and again when the babies were one year old, public health and social workers interviewed the mothers at home. The mothers rated the infants on a number of temperamental characteristics, such as activity level, social responsiveness, and ease of handling and reported distressing infant habits, such as temper tantrums or irregular sleeping or feeding habits. The interviewers also checked a series of adjectives that characterized the mothers interaction with their babies.

Two board certified pediatricians from Honolulu periodically came to Kauai to conduct a medical examination when the children were approximately 2 years old. A systematic appraisal of all organ systems yielded an assessment of each child's overall physical status (rated superior, normal, below normal, or retarded). Independently, two psychologists from the University of Hawaii assessed the children's cognitive development with the Cattell Infant Intelligence Scale and self-help skills with the Vineland Social Maturity Scale. They also completed adjective checklists to describe the behavior of the toddler and the parent-child interactions during the testing session.

When the children were 10 years old, field staff collected existing information about each of the 1955 birth cohort from the following sources: Records of local physicians and hospitals, records of the Department of Health, the Division of Mental Health Services, the Department of Social Services and Housing and the Division of Special Services of the Department of Education.

The field staff obtained new information about each child from (1) A home interview with the primary caregiver, covering illnesses, accidents, and hospitalizations of the children between ages 2 and 10 and behavior problems observed at home; (2) Questionnaires filled out by the current teacher, including grades in reading, writing, and arithmetic and a checklist of behavior problems observed in the classroom; (3) The results of two group tests -- the Bender Gestalt and the Primary Mental Abilities (PMA) test-sampling reasoning, verbal, numerical, spatial and perceptual-motor skills. Some 30% of the children with learning and/or behavior problems received additional diagnostic examinations from appropriate specialists.

The combined screening and diagnostic information was reviewed by a panel of the resident study staff, consisting of a pediatrician, a psychologist and a public health nurse, who prepared a need-assessment for each child, estimating the effect of any existing handicap on school progress and the need for future care (i.e. medical, remedial education, or mental health services).

When the cohort reached ages 17/18, the study team searched the educational, health, mental health and social service agency records of the community, including police and family court records, and administered group tests of ability and achievement in the high schools.

We used the California Psychological Inventory (CPI) to obtain (1) measures of self-assurance and interpersonal adequacy, (2) measures of socialization and responsibility, (3) measures of achievement potential and intellectual efficiency, and (4) measures of intellectual and interest modes. We used the Nowicki Locus of Control Scale to ascertain the youth's faith in the effectiveness of their own actions.

A semistructured interview explored the youths' attitudes toward school, their current interests and activities, their occupational plans, and their participation in and satisfaction with work and social life. In addition the youths were asked about their preference in friends, their perspectives on their own strengths and weaknesses, and matters about which they worried. The interview yielded a number of ratings on a 5 point scale from (1)--very high to (5)--very low. Among the dimensions rated were overall attitude toward school, achievement motivation, realism of educational and vocational plans, overall social adjustment (with peers), overall family adjustment, and self-esteem.

We also asked for an evaluation of the help youngsters had received from informal and formal sources of support -- such as siblings, peers, older friends, teachers, ministers, mental health professionals, and community agencies. The latter contacts were verified in the records of the local social service agencies and also provided an independent check on stressful life events that had occurred in adolescence.

Our ratings of the quality of adult adaptation at age 32 were based on both the individuals' self-evaluations (in a clinical interviews and biographical questionnaires), and on their record in the community.

The following criteria were used to define "successful coping in early adulthood: (See transparency)

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| School/Work: | is employed and/or is enrolled in school; is satisfied with work and/or school achievement; |
| Relationship with spouse/mate: | is married or in long-term committed relationship; is |

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| | satisfied with partner and reports little or no conflict; no record of desertion, divorce, or spouse abuse in court files; |
| Relationship with children: | evaluates children positively; is satisfied with parental role; no record of child abuse or delinquent child support payment in court files; |
| Relationship with peers: | has several close friends who provide emotional support when needed; is satisfied with their relationship; no record of assault, battery, rape, or other criminal offenses in court files; |
| Self-assessment: | Is (mostly) satisfied with present state of life; reports no dependency on alcohol or drugs; no psychosomatic illnesses; no record of psychiatric disorders in Mental Health Register. |

## Follow-up Sample

The follow-up sample that I will focus on this morning includes all children in the 1955 birth cohort on Kauai who were considered in need of remedial service for learning disabilities <u>before</u> the Education for All Handicapped Children's Act (1975) became the law of the land. When the children were ten years old, a review panel consisting of a pediatrician, a psychologist, and a public health nurse, recommended referral to an LD class or resource room on the basis of the following criteria:

1. Evidence of serious reading problems (i.e., reading more than one grade level below age expectancy), despite average or above average performance on the Wechsler Intelligence Test for Children (WISC);
2. WISC subtest scores characterized by a great deal of scatter, with a discrepancy of more than one standard deviation between verbal and performance IQ;
3. Significant number of errors, for age, on the Bender-Gestalt test (mean errors: 4.5, Koppitz scoring);
4. Behavior checklists, completed independently by teachers and parents, that noted the child was persistently "distractible," "hyperactive," and/or "unable to concentrate."

There were thirteen boys and nine girls among the 698 children in the total cohort who were diagnosed as having learning disabilities by age 10. Three out of four children in this group had grown up in chronic poverty, in homes where the breadwinner was an unskilled or semi-skilled laborer, and where the parents had not graduated from high school. Children of Hawaiian and part Hawaiian heritage were overrepresented in this group (36% vs. 22% in the

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cohort), children of Japanese descent were underrepresented (18% vs. 33% in the cohort).

We carefully matched the LD cases with controls, drawn randomly from the master list of 1955 births, who were of the same gender and came from the same socioeconomic and ethnic background, but who had no learning or behavior problems at age ten.

I will first present differences between the LD and control cases on selected variables at birth, in infancy, and early childhood. I will then focus on their status in their teens and in early adulthood. Finally, I will take a look at the links between protective factors and outside sources of support that contributed to a successful adult adaptation for most of the high risk individuals in this cohort.

Early Risk Factors (See transparency)

Children in this cohort who were diagnosed as having learning disabilities by age ten had a higher proportion of moderate - severe perinatal complications (10% vs. 0%). low birthweight (14% vs. 4.5%), congenital defects (9% vs. 4.5%), and conditions judged by physicians at birth to be related to minimal brain dysfunctions (MBD)(13% vs. 5%) than matched control cases of the same gender, SES, and ethnic group.

By age one year, a significantly higher proportion of mothers of children who were diagnosed as learning disabled, rated their infants as "not affectionate," "not cuddly," "not good-natured," and as "fretful," than did control mothers. In turn, more mothers of children who later developed learning disabilities were rated as "erratic" and "worrisome" by public health nurses and social workers who observed them in the home.

By age two, children who were diagnosed as learning disabled were characterized by psychologists during developmental examinations significantly more often as "awkward," "distractible," "fearful," "restless," "slow," or "withdrawn" than toddlers in the control group; and their mothers were more often characterized as "careless," "indifferent," or "overprotective." There was also a significant difference between children who developed learning disabilities (N:22) and controls (N:22) on the Cattell Infant Intelligence Scale ($p<.01$). The mean Cattell IQ of future LD cases was in the "slow learner" range (88); that of the control children was in the normal range (100).

Independently of the psychological examination, pediatricians rated a higher proportion of future LD children as "below normal" in physical development at age two (24% vs. none in the control group). Thus it appears that both pediatric and psychological screening in early childhood did identify a significant proportion of toddlers who later had serious learning problems in school.

### The Learning Disabled in Adolescence

In the time span between ages 10 and 18, four-fifths of the youths diagnosed as learning disabled by age 10 but only 9% of the controls had some contact with community agencies. Differences between individuals with learning disabilities and controls were highly significant for total agency contacts, and for specific contacts with the Department of Education's Office of Special Services, the high school counselors, the Department of Health, and the judiciary system (Police and Family Court).

One third of the individuals with learning disabilities were seen by the Department of Education's Special Services because of their poor academic record and poor school attendance. One fourth had contacts with the police; half of these contacts were for repeated delinquencies that led to referrals to the Family Court. Among the offenses were car theft, malicious injury, larceny, burglary, running away from home, repeated truancy, curfew violations, trespassing, and unlawful hunting -- generally records of impulsive anti-social behavior. One sixth of the individuals with learning disabilities were seen by the Department of Health, either the Division of Public Health Nursing (for diagnostic tests of organic brain damage, or in the case of two LD girls, for confirmation of teenage pregnancy), or by the Division of Mental Health (for diagnosis and/or therapy).

In spite of excellent educational, medical, and social services available and easily accessible on this small island (population 45,000), only half of the individuals with learning disabilities diagnosed at age ten received some form of assistance during adolescence. Six obtained help in academic skills (in special class or learning centers, in home tutoring, or work-study programs); two obtained vocational skill training (in a Job Corps and Rehabilitation Program); two received psychotherapy, one received drug therapy. Often, one agency did <u>not</u> know about the activities of the others or about diagnostic information that was already available on the client.

<u>Individuals with Learning Disabilities at Age 17/18</u>

We were able to contact 90% of the individuals with learning disabilities (N:20) and their matched controls (N:20) for extensive interviews and testing at age 17/18. When we compared interview ratings of individuals who received some form of positive intervention by community agencies with those who did *not*, we found few significant differences. Among the "treated" individuals with learning disabilities was a lower proportion of youths with low self-esteem and feelings of conflict, and a higher proportion who were achievement motivated than among the "untreated." However, a majority of *both* the treated and the untreated LD individuals were still limited in their participation in school activities in their senior year, were *not* very realistic in their educational and vocational plans beyond high school, and had only a "fair" to "poor" social and family life.

Group tests (SCAT and STEP), taken in grade 12, confirmed a picture of continued poor scholastic performance and serious underachievement for youths diagnosed as learning disabled in grade 4. On the threshold of adulthood, these individuals scored significantly lower than control cases on measures of self-assurance and interpersonal adequacy, socialization and responsibility, achievement potential and intellectual efficiency (on the California Psychological Inventory). There was also a highly significant difference between the two groups on the Nowicki and Strickland Locus of Control Scale (1973)($p<.01$). Youths with learning disabilities believed more strongly than the controls that they could not influence events or their fate by their own actions.

Had we concluded our investigation of the learning disabled individuals at the threshold of adulthood, we would have come up with a fairly negative prognosis: Only one out of four among the LD children identified by age ten had improved their lot by age 18. The few lucky one who did, gave credit to the sustained emotional support of family members, peer friends or elder mentors who bolstered their self-esteem. In contrast, most learning disabled teenagers considered intervention by counselors, mental health professionals, and special educators of "little help" to them.

The Learning Disabled in their Early Thirties (See transparency)

During our most recent follow-up in 1987, we were able to obtain interview data (about work, family, and social life) as well as an assessment of their state of health and well-being from 82% of the learning disabled individuals and 90% of the control group. In addition, we have information on all individuals in this birth cohort who had a record with the criminal, civil, and family courts of the state of Hawaii, the statewide Mental Health Registry (which monitors in- and out-patient treatment); the state Departments of Health, Social Services, and Housing; and the U.S. Veterans Administration (which records educational and disability payments extended to individuals who enlisted and were honorably discharged from the Armed Forces).

By age 32, the life course of most learning disabled individuals had considerable improved. Less than 10% each had criminal records, and/or a record of persistent mental health problems in adulthood -- in contrast to 27% with delinquency records, and 32% with serious mental health problems in adolescence. Their marriage and divorce rates were similar to the 1955 cohort as a whole, as was their employment rate. None were unemployed or relied on welfare payments, though the majority (some 80%) worked in semi-skilled jobs--in contrast to only 20% in the control group (See transparency Table 2).

One half among the learning disabled individuals went on to obtain additional schooling in community colleges after high school (compared to 80% of the control group). One fourth of the individuals with learning disabilities worried about their work and reported stress-related health problems--a rate twice as high as that of the control group. Two males (out of 13 males with LD) and two females (out of nine females with LD) had persistent problems. The two men, both of whom were offspring of alcoholics, had an adult criminal record. The two women, both of whom had mental health problems at age 10 and 18, still had psychiatric problems in early adulthood. But three out of four (75%) among the learning disabled individuals were judged to have made a successful adaptation to the demands of work, marriage, and family life at age 32, as did four out of five among the controls (80%).

## Protective Factors that Contributed to Successful Adult Adaptation

Several clusters of protective factors appeared in the records and interviews of the learning disabled individuals who had made a successful adaptation by age 32. Cluster 1 included temperamental characteristics of the individual that helped him/her to elicit positive responses from a variety of caring persons: Parents, teachers, friends, spouses, or mates. Cluster 2 included skills and values that led to an efficient use of whatever abilities they had: Faith that the odds could be overcome; realistic educational and vocational plans; regular household chores and domestic responsibilities. <u>Cluster 3</u> included characteristics and caregiving styles of the parents that reflected competence and fostered self-esteem in the child; maternal education beyond high school; rules and structure in the household; for girls, the model of a mother who was gainfully employed. <u>Cluster 4</u> consisted of supportive adults who fostered trust and acted as gatekeepers for the future. Among these "surrogate" parents were grandparents, elder mentors, youth leaders, and members of church groups. <u>Finally,</u> there was the opening of opportunities at major life transitions from high school to the work place, and from civilian to military life, that turned the trajectory of a significant proportion of the learning disabled individuals on the path to mature adulthood.

When we examine the links between protective factors in the individual and outside sources of support we note an interactional continuity that appeared in the life course of learning disabled individuals who had successfully coped with the developmental tasks of early adulthood: There was, for example, a significant positive link between an "easy" infant temperament and the sources of support available to the individual in early and middle childhood. Active babies, without distressing sleeping and feeding habits, tended to elicit more positive responses from their mothers at age one and from alternate caregivers by age two then those with distressing habits. In middle childhood such children tended to rely on a wider network of caring adults both <u>within</u> and <u>outside</u> the family circle than children with a more "difficult" temperament. "Difficult" temperament traits in infancy, in contrast, were moderately linked with behavior problems in the classroom and at home at age ten, and in turn, generated fewer sources of emotional support for the teenager d;uring adolescence.

Positive parental interactions with the infant and toddler were, in turn, associated with greater autonomy and social maturity at age two, and with better problem-solving skills at age ten in the child.

Problem solving skills at ten were positively linked with the number of sources of help that the adolescent attracted (family members, teachers, peers), and with a sense of self-efficacy at age 18. High self-esteem at age 18 was, in turn, linked to lower distress and emotionality for the men at age 32, and generated a greater number of sources of emotional support for the women, including support from a spouse or mate.

For the women, a sociable temperament in infancy and young adulthood showed a stronger link with positive outcomes by age 32 than for the men. Mothers who had graduated from high school, and who were steadily employed by the time their children were two years old, appeared to be more powerful positive buffers for daughters than sons. The absence of behavior problems in middle childhood, high self-esteem, and an internal locus of control at age 18, also were more strongly linked to successful adult adaptation for the women than for the men.

For the men, at least average intelligence and (non-verbal) problem-solving skills were more strongly associated with a successful transition into adult responsibilities than for the women. The strongest positive buffer for the men, however, were the sources of emotional support upon which they could rely after they left home, including the support of a spouse or mate, siblings, and elder mentors.

Parental competence, as manifested in the educational level of the parents, also proved to be a significant protective factor in the lives of the learning disabled men and women. A higher parental educational level was linked to more positive parent-child interactions in the first and second year of life, and to more emotional support provided for the offspring during early and middle childhood. Parental education was also positively linked to the infants' health and physical status by age two.

There were also significant positive links between parental educational level and the child's competence at ten; one path was <u>direct</u>, the other was mediated through the infant's health and physical status. Better educated parents had healthier children with fewer handicaps and absences from school.

While parental competence and the sources of support available in the childhood home were modestly linked to the quality of adult adaptation, they made less of a <u>direct</u> impact in adulthood than the individuals' competencies, degree of self-esteem and self-efficacy. Many learning disabled youths left their island community after high school, and sought environments they found more compatible. As they moved into adulthood, they encountered opportunities that turned the life trajectories of a significant proportion of these men and women on the path to maturity. Among the life events that were considered critical turning points by these men and women were: joining the work force and establishing themselves in a job;

seeking additional education in a (community) college; joining the Armed Forces to gain educational and vocational skills; and becoming an active member of a church or religious community.

## Discussion

The learning disabled individuals whose lives we have followed from birth to adulthood, come from a more disadvantaged background than children who are clients of psychotherapists or of private centers for educational therapy (Spekman, Oi, Goldberg & Herman, 1989). They went to public schools at a time when there were fewer provisions for the early education of developmentally disabled children in the U.S.A. than there are today. Truly, the "odds were against them," yet with few exceptions, they have grown into responsible adults who hold down a job; have stable marriages; are caring parents. None rely on public assistance for support.

The most important lesson that we choose to learn from this study is hope, a hope reinforced by reports from a handful of other long-term studies into adulthood which have identified some of the protective buffers and mechanisms that operated in the lives of vulnerable children and youths who succeeded against the odds. In a variety of risk conditions studied (see Spekman, N.J. and B. Keogh, in today's session) there appears a common core of individual dispositions and sources of support that led to positive outcomes in adulthood.

This core includes temperamental characteristics that elicit positive social responses from parents, peers, and teachers; efficacy, planfulness, and self-esteem; competent caregivers and supportive adults (other than parents) who foster trust and a sense of coherence or faith; and "second chance" opportunities in society at large in their late teens and 20's (at school, at work, in church, in the military) which enable high risk youths to acquire competence and confidence.

Our finding and those by other American and European investigators with a life-span perspective suggest these buffers appear to transcend ethnic, social class, geographical, and historical boundaries.

## Implications for Developmental Theory (See transparency)

In 1987, F.D. Horowitz, a developmental psychologist, published an adaptation of a model originally used to analyze the relationship of the resilience and susceptibility of an organism to bacterial infection that can serve as a guide to research on the effects of biological and/or social risk factors on the development of children, including those with learning disabilities. Her "structural-behavioral model of development" assumes that the adequacy of development of an individual in a particular domain is the result of individual organismic factors acting in relation to aspects of the environment that facilitate or impede development at any given period of the life cycle.

Relative resiliency in this model is a constitutionally based organismic characteristic that accounts for individual differences from person to person and may have genetic or non-genetic origins. Resiliency means that even under adverse circumstances the constitutional resources of the individual are such that the rate and quality of development in a particular behavioral domain will not be seriously affected. Environments, in turn, can range on a continuum from facilitative to nonfacilitative, and include specific learning opportunities, as well as the more complex social system and culture in which the individual is raised. The degree of facilitation by the environment at any point in time may be different for different behavioral domains. The model makes the assumption that there are points of reorganization in the life course at which the individual's vulnerability or resiliency to particular environments may change.

As the Horowitz model would suggest, we noted a range from relative resiliency to vulnerability in the life course of learning disabled individual a range that changed at different points of the life cycle, for example at the onset of adolescence or in the transition to adulthood. The <u>transactions across time</u> between constitutional characteristics of the individual and aspects of the caregiving environment that were supportive or stressful determined the quality of adult adaptation of LD individuals in different domains--at work, in interpersonal relationships, and in the person's overall satisfaction with life.

## Implications for Intervention

The lives of the individuals with learning disabilities inform us of the need to look beyond our narrow horizons of professional specialization to ways in which we can provide a continuum of services which (a) reduce the liklihood of negative chain reactions associated with a learning disability; (b) promote self-esteem and efficacy; and (c) offer opportunities, not just during the compulsory school years, but also "second chances" in later life (Rutter, 1987).

The promotion of self-efficacy in a young person is probably the key ingredient in any effective intervention process (Bandura, 1977). Self-esteem can be derived not only from academic competence. Most of the children with learning disabilities who coped well in adulthood took pleasure in interests and hobbies that brought them solace when things fell apart in their lives. In their teens, they also engaged in activities that allowed them to be part of a cooperative enterprise, whether being cheerleader for the home team, or members in 4-H Clubs or the YMCA.

Self-efficacy also grew when youngsters took on a responsible position commensurate with their ability, whether it was part-time paid work, or managing the household when a parent was incapacitated; or most often, caring for younger siblings. At some point in their lives, usually in middle childhood and adolescence, the learning disabled youngsters who grew into competent and caring adults were required to carry out some socially desirable task to prevent others in their family, neighborhood, or community from experiencing distress or discomfort. Such acts of required helpfulness (Rachman, 1979) can also become a crucial element of intervention programs that involve these youths in part-time community service; either paid, or for academic credit.

Most of all, self-esteem was promoted through supportive relationships. The learning disabled youngsters who overcame the odds all had at least one person in their lives who accepted them unconditionally, regardless of temperamental idiosyncracies, physical attractiveness, or level of intelligence. Most established such a close bond early in their lives, if not with a parent, then with another family member--a grandparent or favorite aunt or uncle. Some of the learning disabled youths who had problems in their teens, but staged a recovery in young adulthood, gained a more positive self-concept in the context of an intimate relationship with a spouse or mate. The experiences from intergenerational mentoring programs also suggest that a close one-to-one relationship with an unrelated elder can foster self-esteem in a learning disabled child or youth. An essential aspect of the encounter is that the youth feels that s/he is special to the other person (Freedman, 1993).

One of the most important lessons we learned from our adult follow-up was that the opening up of opportunities led to major turning points in the lives of learning disabled individuals as they entered their twenties and early thirties. Among the most potent forces for positive change for these youths in young adulthood were: education at community colleges, educational and vocational skills acquired during service in the Armed Forces, and active involvement in a church or religious community.

Attendance at community colleges and enlistment in the Armed Forces provided them with an opportunity to obtain educational and vocational skills that were needed for a successful transition to the adult world of work. Community colleges and courses on Army, Navy, and Air Force bases, as well as on board ship for some of the young sailors, also offered remedial work that allowed high school dropouts to take the General Education Development Test.

Military service turned out to be a constructive option for many of the learning disabled youths in our cohort. The majority utilized the educational benefits they earned *both* during and after the enlistment period. Military service also provided them with opportunities for personal growth in a structured setting, and a chance to take on responsibilities that enhanced their self-esteem. Elder (1986), and Long and Vaillant (1984) have noted that army service performed a similar function for earlier generations of youths during World War II and the Korean War.

Involvement in church activities and a strong faith provided meaning to the adult lives of some individuals with learning disabilities. Participation in church activities provided structure for their lives, and assured them salvation, security, and a sense of mission. The central component in the lives of the individuals in this study who coped effectively in adulthood, in spite of a learning disability, was a feeling of confidence that the *odds* can be overcome. Some of the luckier ones developed such hopefulness early in their lives, in contact with caring adults. Many of their troubled peers had a second chance at developing a sense of self-esteem and self-efficacy in adulthood with persons who opened up opportunities and gave meaning to their lives.

We need to keep in mind that our longitudinal research has focused on children and youths who pulled themselves up by their own bootstraps. Yet, there are some important lessons these young people can teach us: Research and intervention with learning disabled individuals requires an ecological perspective that takes into account the different demands made of the individual in the context of the home, the school, the world of work, and the community at large. It also needs a transactional perspective that recognizes the large individual differences among such individuals in their responses to <u>both</u> negative and positive circumstances in their environment.

It requires interdisciplinary cooperation to forge a chain of protective factors that reduce the negative impact of a learning disability, increase an individual's efficacy and open up opportunities for success. Such intervention necessitates the professional skills of pediatricians, psychologists, special educators, vocational counselors and therapists. But it also requires an awareness of informal support systems that already exist in the lives of learning disabled individuals and that can be utilized to enlarge their repertoire of problem-solving skills, and to enhance their self-esteem. Research on resilient children has shown repeatedly that older siblings, grandparents, caring neighbors, youth group leaders, and elder mentors can play such enabling roles. These informal ties need to be encouraged and strengthened, not displaced by formal intervention programs.

A cooperative effort by concerned volunteers and competent professionals could generate a continuum of care that cuts across narrow disciplinary boundaries. It would involve health professionals who provide follow-up care for learning disabled children with "organic" causes; and early childhood educators, remedial teachers, and tutors who teach academic skills to children who are failing in the first three grades. It would also include vocational counselors who assist learning disabled youths in high school with realistic educational and vocational plans; community college instructors who welcome learning disabled adults who are motivated to return to school and upgrade their skills; and volunteers who serve as their mentors and boost their self-esteem.

Research and intervention in the lives of individuals with learning disabilities appear most useful if it is based on a life-span perspective that goes beyond the narrow confines of the school or therapy setting, and asks how effectively the individual manages the developmental tasks of adulthood. Such a question can only be answered by long-term follow-up studies which can inform us about <u>both</u> the benefits and costs of intervention.

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## ABSTRACT

This report traces the development of 22 children with learning disabilities and 22 controls (matched by sex, ethnicity, and socioeconomic status) from birth to adulthood. Individuals are members of the Kauai Longitudinal Study which followed all children born in 1955 on a rural Hawaiian island from the perinatal period to ages 1, 2, 10, 18, and 32 years. Most learning-disabled individuals made a successful adaptation to adult life. Marriage, divorce, and employment rates were similar to the cohort as a whole; the proportion with mental health problems and criminal behavior declined from adolescence to adulthood. Several clusters of protective factors were identified that contributed to the resilience of these high-risk individuals. Implications of the findings for research and intervention are discussed.