

Wednesday, October 13, 2004 (continued)

II. Patterns of Co-occurrence and Development (continued)

12:00 p.m. Multiple Behavior Problems and Shared Risk
Deborah M. Capaldi, Ph.D.
Senior Scientist
Oregon Social Learning Center

12:20 p.m. Implications for Intervention
Richard F. Catalano, Ph.D.
Director
Social Development Research Group
University of Washington, Seattle

12:40 p.m. Discussion

1:10 p.m. Lunch

III. Safety, Effectiveness, and Generalizability of Interventions for Preventing Violence and Other Outcomes

2:10 p.m. Prenatal and Infancy Home Visiting by Nurses
David Olds, Ph.D.
Director
Prevention Research Center for Family and Child Health
Professor of Pediatrics
University of Colorado Health Sciences Center
University of Colorado

2:30 p.m. FAST Track
Kenneth A. Dodge, Ph.D.
William McDougall Professor of Public Policy
Professor of Psychology
Duke University
Director
Center for Child and Family Policy

2:50 p.m. Good Behavior Game (GBG)
Sheppard G. Kellam, M.D.
Director
Center for Integrating Education and Prevention Research in Schools
American Institutes for Research

Wednesday, October 13, 2004 (continued)

III. Safety, Effectiveness, and Generalizability of Interventions for Preventing Violence and Other Outcomes (continued)

- 3:10 p.m. Linking the Interests of Families and Teachers (LIFT)
John B. Reid, Ph.D.
Executive Director
Oregon Social Learning Center
- 3:30 p.m. Discussion
- 4:00 p.m. The Incredible Years: Parent, Teacher, and Child Training Series (IYS)
Carolyn Webster-Stratton, Ph.D.
Professor
Family and Child Nursing
University of Washington, Seattle
- 4:20 p.m. Multidimensional Treatment Foster Care (MTFC)
Patricia Chamberlain, Ph.D.
Senior Research Scientist
Oregon Social Learning Center
- 4:40 p.m. Multisystemic Therapy (MST)
Scott Walter Henggeler, Ph.D.
Director
Family Services Research Center
Professor
Department of Psychiatry and Behavioral Sciences
Medical University of South Carolina
- 5:00 p.m. Preventing Violence and Related Health-Risking Social Behaviors in
 Adolescents—An Evidence Assessment Report
Linda S. Chan, Ph.D.
Professor
Department of Pediatrics
Director
Biostatistics and Outcomes Assessment
Los Angeles County and University of Southern California Medical Center
- 5:20 p.m. Discussion
- 5:50 p.m. Adjournment

Thursday, October 14, 2004

IV. Interventions to Reduce Violence and Related Behaviors: Commonalities, Costs, and Practice

- 8:30 a.m. Commonalities Among Safe and Effective Interventions
Delbert S. Elliott, Ph.D.
Director
Center for the Study and Prevention of Violence
Institute of Behavioral Science
University of Colorado
- 8:50 a.m. Features of Ineffective and/or Unsafe Interventions
Thomas J. Dishion, Ph.D.
Professor of Psychology
Child and Family Center
University of Oregon
- 9:10 a.m. Costs and Benefits of Different Prevention and Intervention Strategies
Steve Aos, M.S.
Associate Director
Washington State Institute for Public Policy
- 9:30 a.m. Services and Systems of Care
John A. Landsverk, Ph.D.
Director
Child and Adolescent Services Research Center
Children's Hospital Health Center, San Diego
- 9:50 a.m. Discussion
- 10:20 a.m. Adjournment

Friday, October 15, 2004

- 9:00 a.m. Presentation of the State-of-the-Science Statement
- 9:30 a.m. Public Discussion
The panel chair will call for questions and comments from the audience on the draft state-of-the-science statement, beginning with the introduction and continuing through each subsequent section in turn. Please confine your comments to the section under discussion. The chair will use discretion in proceeding to subsequent sessions so that comments on the entire statement may be heard during the time allotted. Comments cannot be accepted after 11:30 a.m.

- 11:00 a.m. Panel Meets in Executive Session
Panel meets in executive session to review public comment. Conference participants are welcome to return to the main auditorium to attend the press conference at 2 p.m.; however, only members of the media are permitted to ask questions during the press conference.
- 2:00 p.m. Press Conference
- 3:00 p.m. Adjournment

Panel Members

Panel Chair: Robert L. Johnson, M.D.

Panel and Conference Chairperson
Professor and Chair
Department of Pediatrics
Professor of Psychiatry
Director of Adolescent and Young
Adult Medicine
University of Medicine and Dentistry
of New Jersey
New Jersey Medical School
Newark, New Jersey

Shrikant I. Bangdiwala, Ph.D.

Professor
Collaborative Studies Coordinating Center
Department of Biostatistics
University of North Carolina at Chapel Hill
Chapel Hill, North Carolina

Michael F. Cataldo, Ph.D.

Professor of Behavioral Biology
Departments of Pediatrics and Psychiatry
The Johns Hopkins University School
of Medicine
Director
Department of Behavioral Psychology
Kennedy Krieger Institute
Baltimore, Maryland

J. Virgil Costley, Jr., J.D.

Juvenile Court Judge (Retired)
Professor of Paralegal Studies and
Criminal Justice
DeKalb Technical College
Covington Campus
Covington, Georgia

Angela Diaz, M.D., M.P.H.

Professor of Pediatrics and Community
Medicine
Mount Sinai School of Medicine
Director
Mount Sinai Adolescent Health Center
Mount Sinai Medical Center
New York, New York

Leon Eisenberg, M.D.

Presley Professor of Social Medicine
Professor of Psychiatry, Emeritus
Department of Social Medicine
Harvard Medical School
Boston, Massachusetts

Richard O. Lempert, Ph.D., J.D.

Director
Division of Social and Economic Sciences
National Science Foundation
Arlington, Virginia

**Angela Barron McBride, Ph.D., R.N.,
F.A.A.N.**

University Dean and Distinguished Professor
Indiana University School of Nursing
Indianapolis, Indiana

Lisa Schwartz, M.D., M.S.
Senior Research Assistant
Veterans Affairs Outcome Group
Associate Professor of Medicine and
Community and Family Medicine
Dartmouth Medical School
Hanover, New Hampshire
Veterans Affairs Medical Center
White River Junction, Vermont

J. Clay Smith, Jr., J.D., LL.M, S.J.D.
Professor of Law
Howard University School of Law
Washington, DC

Freya Sonenstein, Ph.D.
Professor
Director
Center for Adolescent Health Promotion
and Disease Prevention
The Johns Hopkins Bloomberg School of
Public Health
Baltimore, Maryland

Bonita Stanton, M.D.
Professor and Chair
Carman and Ann Adams Department
of Pediatrics
Children's Hospital of Michigan
Wayne State University
Detroit, Michigan

David T. Takeuchi, Ph.D.
Professor
School of Social Work
University of Washington
Seattle, Washington

Steven Woloshin, M.D., M.S.
Senior Research Associate
Veterans Affairs Outcomes Group
Associate Professor of Medicine and
Community and Family Medicine
Dartmouth Medical School
Hanover, New Hampshire
Veterans Affairs Medical Center
White River Junction, Vermont

Speakers

Steve Aos, M.S.

Associate Director
Washington State Institute for Public Policy
Olympia, Washington

Deborah M. Capaldi, Ph.D.

Senior Scientist
Oregon Social Learning Center
Eugene, Oregon

Richard F. Catalano, Ph.D.

Director
Social Development Research Group
University of Washington, Seattle
Seattle, Washington

Patricia Chamberlain, Ph.D.

Senior Research Scientist
Oregon Social Learning Center
Eugene, Oregon

Linda S. Chan, Ph.D.

Professor
Department of Pediatrics
Director
Biostatistics and Outcomes Assessment
Los Angeles County and University of
Southern California Medical Center
Los Angeles, California

Rand D. Conger, Ph.D.

Professor
Human and Community Development
University of California, Davis
Davis, California

Thomas J. Dishion, Ph.D.

Professor of Psychology
Child and Family Center
University of Oregon
Eugene, Oregon

Kenneth A. Dodge, Ph.D.

William McDougall Professor of
Public Policy
Professor of Psychology
Duke University
Director
Center for Child and Family Policy
Durham, North Carolina

Felton Earls, M.D.

Professor
Department of Social Medicine
Harvard Medical College
Cambridge, Massachusetts

Delbert S. Elliott, Ph.D.

Director
Center for the Study and Prevention
of Violence
Institute of Behavioral Science
University of Colorado
Boulder, Colorado

Scott Walter Henggeler, Ph.D.

Director
Family Services Research Center
Professor
Department of Psychiatry and
Behavioral Sciences
Medical University of South Carolina
Charleston, South Carolina

Sheppard G. Kellam, M.D.

Director
Center for Integrating Education and
Prevention Research in Schools
American Institutes for Research
Baltimore, Maryland

Michele D. Kipke, Ph.D.

Professor
Department of Pediatrics
University of Southern California
Keck School of Medicine
Director
Division of Research on Children, Youth,
and Families
Childrens Hospital Los Angeles
Los Angeles, California

Benjamin B. Lahey, Ph.D.

Professor of Psychiatry
Chief of Psychology
Department of Psychiatry
University of Chicago
Chicago, Illinois

John A. Landsverk, Ph.D.

Director
Child and Adolescent Services
Research Center
Children's Hospital Health Center,
San Diego
San Diego, California

Rolf Loeber, Ph.D.

Professor of Psychiatry, Psychology, and
Epidemiology
University of Pittsburgh
Pittsburgh, Pennsylvania

Terrie E. Moffitt, Ph.D.

Professor
Department of Psychology
University of Wisconsin
Madison, Wisconsin

David Olds, Ph.D.

Director
Prevention Research Center for Family
and Child Health
Professor of Pediatrics
University of Colorado Health
Sciences Center
University of Colorado
Denver, Colorado

John B. Reid, Ph.D.

Executive Director
Oregon Social Learning Center
Eugene, Oregon

Robert J. Sampson, Ph.D.

Henry Ford II Professor of the
Social Sciences
Department of Sociology
Harvard University
Cambridge, Massachusetts

Carolyn Webster-Stratton, Ph.D.

Professor
Family and Child Nursing
University of Washington, Seattle
Seattle, Washington

Planning Committee

Planning Chair: Farris K. Tuma, Sc.D.

Chief
Traumatic Stress Program and
Disruptive Behaviors/ADD Program
Division of Mental Disorders,
Behavioral Research, and AIDS
National Institute of Mental Health
National Institutes of Health
Bethesda, Maryland

Karen Babich, Ph.D., R.N.

Director
Office of Global Mental Health
National Institute of Mental Health
National Institutes of Health
Bethesda, Maryland

Jacqueline S. Besteman, J.D., M.A.

Director
EPC Program
Center for Practice and Technology
Assessment
Agency for Healthcare Research and Quality
U.S. Department of Health and
Human Services
Rockville, Maryland

Gail M. Boyd, Ph.D.

Prevention Research Branch
Division of Clinical and Prevention
Research
National Institute on Alcohol Abuse
and Alcoholism
National Institutes of Health
Bethesda, Maryland

Elsa A. Bray

Senior Advisor for Consensus Development
Office of Medical Applications of Research
Office of the Director
National Institutes of Health
Bethesda, Maryland

William Bukoski, Ph.D.

Associate Director for Research
Coordination
Office of the Director
Division of Epidemiology, Services,
and Prevention Research
National Institute on Drug Abuse
National Institutes of Health
Bethesda, Maryland

Nancy A. Carney, Ph.D.

Assistant Professor of Emergency Medicine
Oregon Health & Science University
Portland, Oregon

Adam Glazer

Librarian
Public Services Division
National Library of Medicine
National Institutes of Health
Bethesda, Maryland

W. Rodney Hammond, Ph.D.

Director
Division of Violence Prevention
National Center for Injury Prevention
and Control
Centers for Disease Control and Prevention
Atlanta, Georgia

Mark Helfand, M.D., M.P.H., M.S.

Director
Evidence-Based Practice Center
Oregon Health & Science University
Portland, Oregon

Scott Walter Henggeler, Ph.D.

Director
Family Services Research Center
Professor
Department of Psychiatry and
Behavioral Sciences
Medical University of South Carolina
Charleston, South Carolina

Sally T. Hillsman, Ph.D.

Director
Office of Research and Evaluation
National Institute of Justice
Office of Justice Programs
U.S. Department of Justice
Washington, DC

Kimberly Hoagwood, Ph.D.

Associate Director
Child and Adolescent Research
National Institute of Mental Health
National Institutes of Health
Rockville, Maryland

Marian D. James, Ph.D.

Center for Practice and Technology
Assessment
Agency for Healthcare Research and Quality
U.S. Department of Health and
Human Services
Rockville, Maryland

Robert L. Johnson, M.D.

Panel and Conference Chairperson
Professor and Chair
Department of Pediatrics
Professor of Psychiatry
Director of Adolescent and Young
Adult Medicine
University of Medicine and Dentistry
of New Jersey
New Jersey Medical School
Newark, New Jersey

Michele D. Kipke, Ph.D.

Professor
Department of Pediatrics
University of Southern California
Keck School of Medicine
Director
Division of Research on Children, Youth,
and Families
Childrens Hospital Los Angeles
Los Angeles, California

Joanne Klevens, M.D., Ph.D., M.P.H.

Epidemiologist
Program Development and Evaluation
Branch
Division of Violence Prevention
National Center for Injury Prevention
and Control
Centers for Disease Control and Prevention
Atlanta, Georgia

Doreen S. Koretz, Ph.D.

Associate Director for Prevention
Chief
Developmental Psychopathology
and Prevention Research Branch
Division of Mental Disorders,
Behavioral Research, and AIDS
National Institute of Mental Health
National Institutes of Health
Bethesda, Maryland

Barnett S. Kramer, M.D., M.P.H.
Director
Office of Medical Applications of Research
Office of the Director
National Institutes of Health
Bethesda, Maryland

Kelli K. Marciel, M.A.
Communications Director
Office of Medical Applications of Research
Office of the Director
National Institutes of Health
Bethesda, Maryland

Susan E. Martin, Ph.D.
Health Scientist Administrator
National Institute on Alcohol Abuse
and Alcoholism
National Institutes of Health
Bethesda, Maryland

Peggy McCardle, Ph.D., M.P.H.
Associate Chief
Child Development and Behavior Branch
National Institute of Child Health and
Human Development
National Institutes of Health
Rockville, Maryland

Denise Middlebrook, Ph.D.
Division of Program Development,
Special Populations, and Projects
Center for Mental Health Services
Substance Abuse and Mental
Health Services Administration
Rockville, Maryland

William Modzeleski, M.P.A.
Director
Safe and Drug-Free Schools Program
Office of Elementary and Secondary
Education
U.S. Department of Education
Washington, DC

Richard K. Nakamura, Ph.D.
Deputy Director
Office of the Director
National Institute of Mental Health
National Institutes of Health
Bethesda, Maryland

Karen Patrias, M.L.S.
Senior Resource Specialist
Public Services Division
National Library of Medicine
National Institutes of Health
Bethesda, Maryland

Janice Phillips, Ph.D., R.N., F.A.A.N.
Program Director
Health Promotion and Risk Behaviors
Office of Extramural Programs
National Institute of Nursing Research
National Institutes of Health
Bethesda, Maryland

John B. Reid, Ph.D.
Executive Director
Oregon Social Learning Center
Eugene, Oregon

Cynthia A. Rooney
Senior Advisor to the Consensus
Development Program
Office of Medical Applications of Research
Office of the Director
National Institutes of Health
Bethesda, Maryland

Susan Rossi, Ph.D., M.P.H.
Deputy Director
Office of Medical Applications of Research
Office of the Director
National Institutes of Health
Bethesda, Maryland

Mona J. Rowe, M.C.P.

Associate Director
Office of Science Policy, Analysis,
and Communications
National Institute of Child Health
and Human Development
National Institutes of Health
Bethesda, Maryland

Bruce Simons-Morton, Ed.D., M.P.H.

Chief
Prevention Research Branch
Division of Epidemiology, Statistics, and
Prevention Research
National Institute of Child Health and
Human Development
National Institutes of Health
Rockville, Maryland

Susan Solomon, Ph.D.

Senior Advisor
Office of Behavioral and Social
Sciences Research
Office of the Director
National Institutes of Health
Bethesda, Maryland

Ellen L. Stover, Ph.D.

Director
Division of Mental Disorders,
Behavioral Research, and AIDS
National Institute of Mental Health
National Institutes of Health
Bethesda, Maryland

Melanie Zimmer-Gembeck, Ph.D.

Senior Lecturer
School of Applied Psychology
Director
Family Interaction Program
Deputy Director
Griffith University Psychological Health
Research Centre
Griffith University
Gold Coast Campus
Queensland, Australia

Abstracts

The following are abstracts of presentations to Preventing Violence and Related Health-Risking Behaviors in Adolescents: An NIH State-of-the-Science Conference. They are designed for the use of panelists and participants in the conference and as a reference document for anyone interested in the conference deliberations. We are grateful to the authors, who summarized their materials and made them available in a timely fashion.

Cynthia A. Rooney
Senior Advisor to the Consensus
Development Program
Office of Medical Applications of Research
Office of the Director
National Institutes of Health

Farris K. Tuma, Sc.D.
Chief
Traumatic Stress Program and
Disruptive Behaviors/ADD Program
Division of Mental Disorders,
Behavioral Research, and AIDS
National Institute of Mental Health
National Institutes of Health

Prevalence and Significance of Problem Behaviors

Felton Earls, M.D.

The term framing this conference, problem behavior, requires careful definition. At least two separate meanings come to mind. The first implies risky or dangerous behaviors that carry a high probability of resulting in negative consequences. The manifestation of delinquent, aggressive, or violent behavior connotes both an interpersonal and societal problem, suggesting that constraints or sanctions need to be exercised to control the negative consequences. The fact that such behaviors are acceptable to society, in the case of self-defense for example, or that they can be experienced as pleasurable, is typically sidetracked in this definition. The second designation of the term incorporates the notion of a psychiatric disorder, such as conduct disorder or antisocial personality disorder. This meaning implies that a specific pattern of problems coexists that requires professional attention. These two definitions attract interest from several fields, ranging from law and criminology to medicine and psychology. Of significance is the fact that the multiple and often divergent fields and definitions are being drawn together within the sphere of public health.

Despite their common usage, neither of the two definitions is compelling. The lack of clarity and consistency in their applications is historic. Efforts to advance work in the field has been stymied by several methodological challenges. Although no specific remedy is offered, this definitional issue remains in the background of everything else that will be presented.

The presentation begins with a review of extant evidence on the prevalence of violent or problem behavior using the two definitions just introduced. The first definition is now reflected in a national surveillance system of problem behavior, the Youth Risk Behavior Survey. In public health, this is quite an important achievement. A recent report on trends in violent behavior is reviewed.¹ Following two decades of rising rates of violence that qualified adoption of the phrase, epidemic violence, the prevalence of violence started to decline in the mid-1990s. In fact, the secular decline in these problems has been much more marked than its escalation during the previous period.

Findings on the prevalence of psychiatric disorders resulting from community-based epidemiological studies are considered next. In part, because of a particular interest in conduct disorder, results of the Ontario Child Health Study are highlighted as exemplary.²⁻⁴ Studies of other general population and special population groups (e.g., extreme poverty and institutionalized groups) are also useful in this mix.^{5,6}

Based on this review, consideration is given to what can be learned from this combination of definitions and sources of information. Several methodological challenges are discussed. None of these are new, but drawing them together in one place serves to underscore reasons why they remain persistent.⁷

The presentation concludes with a series of recommendations to advance the field. These include greater use of case histories, innovations in quantitative reasoning and statistical

approaches, revising or revitalizing theories, and the incorporation of evolving concepts of developmental assets and positive psychology into a more holistic framework that includes problem behavior.

The argument for greater reliance on case histories may seem a bit outdated, but the effort put into developing a narrative account of problem behavior is much needed. The concept of prevalence is in danger of becoming much too narrowly focused on a few negative variables. This qualitative approach is meant to be generative and provide nuance and texture to behavioral manifestations that may carry multiple meanings, some negative and some positive.

Recommendations for innovations in quantitative reasoning and statistical inference include use of propensity stratification, Boolean mathematics, pattern analysis, and cluster techniques.

Developmental theories have not kept pace with the rapid advances in neurobiology and behavioral genetics. The extent to which old theories (social learning, psychodynamic, and behaviorism) apply to the new understanding of bio-behavioral mechanisms is not straightforward. The manifestation of a problem behavior should be based in a theory that informs an understanding of its age of onset, patterning over time, its biological and social substrate, its responsiveness to intervention, as well as its potential to be controlled or eradicated. Further, the theory has to account for the presence of the behavior in a person, and to take care not to be misrepresented or misunderstood as an isolated variable.⁸

The idea that violent behavior can coexist with altruistic, benevolent, or socially responsible behavior should not seem strange. Notions of revenge, self-defense, bravery, and toughness all carry connotations of the preparedness to act violently. This manifestation of violent behavior is viewed as justifiable or excusable, to use legal terms. The public health definitions of violence have not accounted for these variants. Thus, prevalent figures are confounded with a set of common displays, such as carrying a weapon, without the capacity to differentiate the motivations and context of such behaviors. The suggested innovations and recommendations have the objective of calling on a person–environment orientation in an area that is plagued by measuring a weak signal in a noisy surrounding.

References

1. Centers for Disease Control and Prevention. Violence-related behaviors among high school students, United States, 1991–2003. *MMWR Morb Mortal Wkly Rep.* 2004;53:651–655.
2. Offord DR, Alder RJ, Boyle MH. Prevalence and sociodemographic correlates of conduct disorder. *Am J Soc Psychiatry.* 1986;6:272–278.
3. Offord DR, Boyle MH, Szatmari P, et al. Ontario Child Health Study. II. Six month prevalence of disorders and rates of service utilization. *Arch Gen Psychiatry.* 1987;44:832–836.
4. Boyle MH, Offord DR. Primary prevention of conduct disorder: Issues and Prospects. *J Am Acad Child Adolesc Psychiatry.* 1990;29:227–233.

5. Teplin LA, Abram KM, McClelland GM, et al. Psychiatric disorders in youth in juvenile detention, *Arch Gen Psychiatry*. 2002;59:1133–1143.
6. Costello EJ, Musillo S, Erkanil A, et al. Prevalence and development of psychiatric disorders in childhood and adolescence. *Arch Gen Psychiatry*. 2003;60:837–844.
7. Roberts RE, Attkisson CC, Rosenblatt A. Prevalence of psychopathology among children and adolescents. *Am J Psychiatry*. 1998;155:715–725.
8. Magnusson D. The person approach: Concepts, measurement models, and research strategy. *New Dir Child Adolesc Dev*. 2003, No 101.

Developmental Course of Health-Risking Behaviors

Terrie E. Moffitt, Ph.D.

This abstract summarizes 10 years of research into a developmental taxonomy of antisocial behavior published 10 years ago that proposed two primary hypothetical prototypes: life-course persistent versus adolescence-limited offenders.¹ According to this taxonomy, life-course persistent offenders' antisocial behavior has its origins in neurodevelopmental processes, and it begins in childhood and continues persistently thereafter into midlife. In contrast, adolescence-limited offenders' antisocial behavior has its origins in social processes, begins in adolescence, and desists when adulthood is attained. According to the theory, life-course persistent antisocial individuals are few, persistent, and pathological. Adolescence-limited antisocial individuals are common, relatively transient, and near normative.

In the past 10 years, the taxonomy has been used to improve classification of subject groups for research and to focus research into antisocial personality and violence toward the most promising causal variables. It has also been used to guide intervention planning. For example, preventing life-course, persistent, antisocial lifestyles requires early childhood interventions in the family, whereas preventing adolescence-limited offending requires individual treatments during the teen years to counteract peer influence (instead of group treatments that facilitate peer influence).² As another example, Scott and Grisso³ argued that the juvenile justice system should identify adolescence-limited delinquents and give them room to reform. They also argued that waiving life-course persistent delinquents to adult court is impractical because the cognitive deficits typical of these delinquents render them unlikely to meet legal criteria for competency to stand trial.

In a nutshell, we suggested that life-course persistent antisocial behavior originates early in life, when the difficult behavior of a high-risk young child is exacerbated by a high-risk social environment. According to the theory, the child's risk emerges from inherited or acquired neuropsychological variation, initially manifested as subtle cognitive deficits, difficult temperament, or hyperactivity. The environment's risk comprises factors such as inadequate parenting, maltreatment, disrupted family bonds, and poverty. The environmental risk domain expands beyond the family as the child ages, to include poor relations with people such as peers and teachers. Opportunities to learn prosocial skills are lost. Over the first two decades of development, transactions between the individual and the environment gradually construct a disordered personality with hallmark features of physical aggression and antisocial behavior persisting to midlife. The theory predicts that antisocial behavior will infiltrate multiple adult life domains: illegal activities, problems with employment, and victimization of intimate partners and children. This infiltration diminishes the possibility of reform.

In contrast, we suggested that adolescence-limited antisocial behavior emerges alongside puberty, when otherwise ordinary healthy youngsters experience psychological discomfort during the relatively role-less years between their biological maturation and their access to mature privileges and responsibilities, a period we called the "maturity gap." They experience dissatisfaction with their dependent status as a child, and impatience for what they anticipate are

the privileges and rights of adulthood. While young people are in this “gap,” it is virtually normative for them to find the delinquent style appealing and to mimic it as a way to demonstrate autonomy from parents, win affiliation with peers, and hasten social maturation. However, because their pre-delinquent development was normal, most adolescence-limited delinquents are able to desist from crime when they age into real adult roles, returning gradually to a more conventional lifestyle. This recovery may be delayed if the antisocial activities of adolescence-limited delinquents attract factors we called “snares,” such as a criminal record, incarceration, addiction, or truncated education without credentials. Such snares can compromise the ability to make a successful transition to adulthood.

Our own investigations of this taxonomy have been carried out mainly in the Dunedin Multidisciplinary Health and Development Study, a 32-year National Institute of Mental Health-funded longitudinal study of a birth cohort of 1,000 New Zealanders.^{4,5} Dunedin findings are generally in keeping with findings reported from other samples in six countries and several States within the United States, although it must be stated that not every study has supported the taxonomy. Studies carried out to date are reviewed in a recent chapter.⁶

A number of findings have received strong empirical support, such as:

- Life-course persistent antisocial behaviour emerges from early neurodevelopmental and family-adversity risk factors, but adolescence-limited delinquency does not.
- Genetic etiological processes contribute more to life-course persistent than adolescence-limited antisocial development.
- Childhood-limited aggressive children followed to adulthood become low-level chronic criminal offenders with personality disorders.
- Abstainers from delinquency are rare individuals who become unpopular with teen peers.
- Life-course persistent and adolescence-limited delinquents develop different personality structures.
- Life-course persistent development is differentially associated with serious offending and violence in adulthood.
- Life-course persistent antisocial development is almost exclusively male, whereas most female antisocial behavior is of the adolescence-limited type.

Some findings have received beginning support, but more research is needed, such as:

- Adolescence-limited antisocial behavior is influenced by the maturity gap between childhood and adulthood and by social mimicry of antisocial role models.
- Childhood-onset antisocial behavior persists into middle adulthood, whereas adolescent-onset antisocial behavior desists in young adulthood.

Some predictions from the taxonomy have not been tested sufficiently, such as:

- Life-course persistent antisocial individuals will be at high risk in midlife for poor physical health, cardiovascular disease, and early disease morbidity and mortality.
- Adolescence-limited offenders must rely on peer support for crime, but life-course persistent offenders should be willing to offend alone (although in adolescence they serve as magnets for less expert offenders).
- “Snares” (such as a criminal record, incarceration, addiction, or truncated education without credentials) should explain variation in the age at desistence from crime during the adult age period, particularly among adolescence-limited offenders.
- The two groups should react differently to turning-point opportunities: adolescence-limited offenders should get good partners and jobs that help them to desist from crime, whereas life-course persistent offenders should selectively get undesirable partners and jobs and in turn expand their repertoire into domestic abuse and workplace crime.

The 1993 taxonomy has generated interest and research. Some findings have been faithful to the hypotheses originally formulated. Other findings have pointed to revisions needed to improve the fit between the taxonomy and nature. There is still work to do.

References

1. Moffitt TE. “Life-course-persistent” and “adolescence-limited” antisocial behavior: A developmental taxonomy. *Psychol Rev.* 1993;100:674–701.
2. Howell JC, Hawkins JD. Prevention of youth violence. *Crime and Justice: A Review of Research.* 1998;24:263–316.
3. Scott ES, Grisso T. The evolution of adolescence: A developmental perspective on juvenile justice reform. *Journal of Criminal Law and Criminology.* 1997;88:137–89.
4. Moffitt TE, Caspi A, Rutter M, Silva PA. Sex differences in antisocial behaviour: Conduct disorder, delinquency, and violence in the Dunedin longitudinal study. Cambridge, UK: Cambridge University Press; 2001.
5. Moffitt TE, Caspi A, Harrington H, Milne B. Males on the life-course persistent and adolescence-limited antisocial pathways: Follow-up at age 26. *Dev Psychopathol.* 2002;14:179–206.
6. Moffitt TE. Life-course persistent and adolescence-limited antisocial behaviour: A 10-year research review and a research agenda. In: Lahey B, Moffitt TE, Caspi A, eds. *The causes of conduct disorder and serious juvenile delinquency.* NY: Guilford; 2003:49–75.

Child Factors

Benjamin B. Lahey, Ph.D.

Children are not equally likely to grow up to be violent. There is little doubt that experiences and social circumstances influence violence, but so do some characteristics of the child. Identifying these predictive characteristics is essential both to prevention science and to theories of violence. Explanations will almost certainly be inaccurate if they fail to take person-by-environment interactions into account. The sensitivity and specificity of early predictors of violence in children is largely unknown, but they are certainly far less than perfect. As more is learned about early predictors, better prediction and more effective theory-based prevention will be possible.

Sex/Gender Differences

Males are far more violent than females. This sex difference is so great that it must be explained to understand the causes of violence.

Dispositions: Personality and Temperament

Three personality traits are related to youth violence. Antisocial youth tend to respond to threat and frustration with intense negative emotions—neuroticism—and are unlikely to be sympathetic to others and to respect rules—agreeableness. Antisocial youth also tend to be unreliable, careless, and bold—low conscientiousness. Conversely, shy, inhibited children are at *low* risk for antisocial behavior. Constraint refers collectively to agreeableness and conscientiousness, and antisocial youth tend to be low in constraint. Indeed, sex differences in constraint account for much of the sex difference in antisocial behavior. Most studies of personality and violence are cross-sectional, but some preliminary studies suggest that child temperament robustly predicts later antisocial behavior and violence.

Cognitive Abilities, Biases, and Attitudes

General intelligence, executive abilities, and language development are inversely related to violence when controlling for socioeconomic status and race–ethnicity. Attributional biases and attitudes towards crime also discriminate violent from nonviolent youth.

Early Aggression and Childhood Mental Disorders

At least among males, oppositional defiant disorder (ODD), but probably not attention-deficit/hyperactivity disorder (ADHD), increases risk for childhood conduct disorder (CD), and CD and aggression robustly predict antisocial behavior and violence.

Peripheral Biological Markers and the Central Neurophysiological System

Resting heart rate is inversely related to antisocial behavior and predicts future antisocial behavior and violence, but other autonomic measures are less predictive. Atypical hypothalamic-pituitary-adrenal axis functioning, indexed by cortisol, is related to aggression, but different studies find positive or inverse relations. Subgroups of reactively or proactively violent youth may show opposite patterns, but this remains to be studied. Sex steroids are associated with social dominance, but probably not with violence. The central neural systems that mediate violence are not well understood, but many studies implicate serotonergic systems in violence.

Genetic Influences on Violence

Genetic variation within all social groups influences the likelihood of antisocial behavior to a moderate degree. It is likely that genetic influences operate through both gene–environment interactions and gene–environment correlations. Indeed, two studies suggest that adolescent antisocial behavior is related to childhood adversity and alleles of the gene influencing monoamine oxidase-A (MAO-A) activity in a gene–environment interaction. The role of MAO-A is particularly interesting because it degrades serotonin and other neurotransmitters.

References

- Beitchman JH, Wilson B, Johnson CJ, Atkinson L, Young A, Adlaf E, Escobar M, Douglas L. Fourteen-year follow-up of speech/language-impaired and control children: psychiatric outcome. *J Amer Acad Child Adolesc Psychiatry*. 2001;40:75–82.
- Caspi A, McClay J, Moffitt T, Mill J, Martin J, Craig IW, Taylor A, Poulton R. Role of genotype in the cycle of violence in maltreated children. *Science*. 2002;297:851–854.
- Caspi A, Moffitt TE, Silva PA, Stouthamer-Loeber M, Schmutte PS, Krueger R. Are some people crime-prone? Replications of the personality-crime relation across nation, gender, race and method. *Criminology*. 1994;32:301–333.
- Crick NR, Dodge KA. Social information-processing mechanisms on reactive and proactive aggression. *Child Dev*. 1996;67:993–1002.
- Farrington DP. The relationship between low resting heart rate and violence. In Raine A, Brennan PA, et al., eds., *Biosocial Bases of Violence*. New York: Plenum, 1997:89–105.
- Foley DL, Eaves LJ, Wormley B, Silberg JL, Maes HH, Kuhn J, Riley B. Childhood adversity, monoamine oxidase A genotype, and risk for conduct disorder. *Arch Gen Psychiatry*. 2004;61:738–744.
- Graham P, Rutter M. Psychiatric disorders in the young adolescent: a follow-up study. *Proc Royal Soc Med*. 1973;66:1226–1229.

- Heaven PCL. Personality and self-reported delinquency: analysis of the “Big Five” personality dimensions. *Pers Individ Dif*. 1996;20:47–54.
- Henry B, Caspi A, Moffitt TE, Silva PA. Temperamental and familial predictors of violent and nonviolent criminal convictions: age 3 to age 18. *Dev Psychol*. 1996;32:614–623.
- Kerr M, Tremblay RE, Pagani-Kurtz L, Vitaro F. Boys’ behavioral inhibition and the risk of later delinquency. *Arch Gen Psychiatry*. 1997;54:809–816.
- Kratzer L, Hodgins S. A typology of offenders: a test of Moffitt’s theory among males and females from childhood to age 30. *Crim Behav Ment Health*. 1999;9:57–73.
- Kroner DG, Mills JF. The structure of antisocial attitudes among violent and sexual offenders. *Int J Offender Ther Comp Criminol*. 1998;42:246–257.
- Lahey BB, Waldman ID. A developmental propensity model of the origins of conduct problems during childhood and adolescence. In BB Lahey, TE Moffitt, A Caspi, eds., *Causes of Conduct Disorder and Serious Delinquency*. New York: Guilford Press, 2003:76–117.
- Lynam D, Moffitt T, Stouthamer-Loeber M. Explaining the relation between IQ and delinquency: class, race, test motivation, school failure or self-control? *J Abnorm Psychol*. 1993;102:187–196.
- Manuck SB, Kaplan JR, Lotrich FE. Brain serotonin and aggressive disposition in humans and nonhuman primates. In press.
- Mason WA, Kosterman R, Hawkins, JD, Herrenkohl TI, Lengua LJ, McCauley E. Predicting depression, social phobia, and violence in early adulthood from childhood behavior problems. *Child Adolesc Social Work J*. 2004;21:307–315.
- McBurnett, K, Lahey, BB, Rathouz, PJ, Loeber, R. Low salivary cortisol and persistent aggression in boys referred for disruptive behavior. *Arch Gen Psychiatry*. 2000;57:38–43.
- Moffitt TE, Caspi A, Rutter M, Silva PA. *Sex Differences in Antisocial Behaviour*. Cambridge, England: Cambridge University Press, 2001.
- Moore TM, Scarpa A, Raine A. A meta-analysis of serotonin metabolite 5-HIAA and antisocial behavior. *Aggress Behav*. 2002;28:299–316.
- Ortiz J, Raine A. Heart rate level and antisocial behavior in children and adolescents: a meta-analysis. *J Amer Acad Child Adolesc Psychiatry*. 2004;43:154–162.
- Rhee SH, Waldman ID. Genetic and environmental influences on antisocial behavior: a meta-analysis of twin and adoption studies. *Psychol Bull*. 2002;128:490–529.
- Rowe R, Maughan B, Worthman CM, Costello EJ, Angold A. Testosterone, antisocial behavior, and social dominance in boys: pubertal development and biosocial interaction. *Biol Psychiatry* 2004; 55:546–552.

Rutter ML. Nature-nurture integration: the example of antisocial behavior. *Amer Psychol.* 1997; 52:390–398.

Seguin JR, Boulerice B, Harden PW, Tremblay RE, Pihl RO. Executive functions and physical aggression after controlling for attention deficit hyperactivity disorder, general memory and IQ. *J Child Psychol Psychiatry.* 1999;40:1197–1208.

Stattin H, Magnusson, D. The role of early aggressive behavior in the frequency, seriousness, and types of later crime. *J Consult Clin Psychol.* 1989;57:710–718.

Tremblay RE, Pihl RO, Vitaro F, Dobkin PL. Predicting early onset of male antisocial behavior from preschool behavior. *Arch Gen Psychiatry.* 1994;51:732–739.

van Goozen SHM, Matthys W, Cohen-Kettenis PT, Buitelaar JK, van Engeland H. Hypothalamic-pituitary-adrenal axis and autonomic nervous system activity in disruptive children and matched controls. *J Am Acad Child Adolesc Psychiatry.* 2000;39:1438–1445.

Family and Peer Factors

Rand D. Conger, Ph.D.

Current evidence suggests that risk for violent and other forms of antisocial behavior involves a developmental process that is significantly influenced by ongoing interactions between a child or adolescent and members of his or her family and peer group. Moreover, peer and family contexts often are interconnected, as noted in the following discussion.

The Family Context of Violence, Aggression, and Antisocial Behavior

Parents and their children. Hostile, aggressive, and violent behaviors of parents toward their children appear to exacerbate similar behaviors by their offspring within and outside the family.^{1,2} Hostile interactions between parents and children often develop into a reciprocal, mutually influential process that leads to increasing conflict and hostility across the years of adolescence.¹ The forms of hostility expressed in these reciprocal interactions can range from critical comments to overt forms of violence including pushing, hitting, grabbing, and shoving,³ reflecting a coercive process linked to the development of antisocial behavior.⁴

Intergenerational continuity in anger and hostility also threatens the development of new families. For example, adolescents raised in families marked by the mutual parent–child hostility just described tend to develop similar patterns of interaction with their romantic partners during early adulthood.¹ For that reason, their third-generation children are likely to be exposed to above average levels of interparental conflict, which also increases the probability of child and adolescent antisocial behavior.⁵ In addition, angry and aggressive parenting increases the chance that children, as adults, will demonstrate the same childrearing style,⁶ thus increasing risk for violence and aggression across multiple generations.

However, effective parenting practices (e.g., monitoring, consistent discipline, supportiveness, and the reinforcement of conventional activities) reduce the probability that a child will develop serious conduct problems.⁷ In addition, effective parenting by one caregiver can serve as a source of child resilience to antisocial behavior when the other parent engages in hostile or violent acts toward the child.⁸

The genetic context of parenting effects. Contemporary research also suggests that these social influences operate in combination with inherited characteristics of the child. Adoption studies, for example, have shown that a child's inherited traits may elicit either effective or ineffective parenting practices (a gene–environment correlation), which further influence the child's antisocial behavior.⁹ Adoption research also has shown that the presence of both genetic risk and a poor rearing environment creates a far higher probability of serious criminality than either genetic or environmental vulnerability alone, suggesting a gene-by-environment interaction effect.¹⁰

Sibling relationships. Important new research demonstrates (1) that the antisocial behavior of siblings plays an important role in risk for the development of conduct problems by their brothers and sisters,¹¹ and (2) that sibling influences operate independently of parenting practices.¹² However, effective parenting promotes resilience to sibling antisocial behavior,¹³ suggesting that parent and sibling influences operate both additively and interactively to affect risk for conduct problems.

The Peer Context of Violence, Aggression, and Antisocial Behavior

Deviant peers are often reported to have the most powerful influence on the development of antisocial behavior, likely through modeling and reinforcement of conduct problems.¹⁴ Rather than operating independently of the family, however, recent studies indicate that both parent and sibling behaviors affect a child's or adolescent's tendency to associate with deviant peers.^{15,16} Thus, experiences in the family appear to affect ties to antisocial peers and these connections have a direct influence on violence and related problem behaviors.

Recommendations for Future Research

1. The study of family influences on violence and associated forms of antisocial behavior needs increased attention to (1) sibling as well as parenting effects and (2) the investigation of gene–environment correlations and interactions.
2. More attention should be given to the mechanisms that may account for family and peer effects, such as reinforcement, punishment, modeling, and cognitive and emotional processes.
3. Needed improvements in research methods include long-term studies that can adequately describe developmental risk processes. Because the source of research information can have a major influence on conclusions about family, peer, and genetic effects, increasing attention also needs to be given to the measurement of theoretical constructs.

References

1. Kim KJ, Conger RD, Lorenz FO, Elder GH Jr. Parent-adolescent reciprocity in negative affect and its relation to early adult social development. *Dev Psychol.* 2001;37:775–790.
2. Stewart EA, Simons RL, Conger RD. Assessing neighborhood and social psychological influences on childhood violence in an African American sample. *Criminology.* 2002;40:801–830.
3. Mitchell E, Conger RD. *Intergenerational continuity and reciprocity in family violence: A technical report.* University of California, Davis: Family Research Group; 2004.

4. Patterson GR, Reid JB, Dishion TJ. *A social learning approach: Antisocial boys (Vol. 4)*. Eugene, OR: Castalia Publishing; 1992.
5. Harold GT, Conger RD. Marital conflict and adolescent distress: The role of adolescent awareness. *Child Dev.* 1997;68:333–350.
6. Conger RD, Neppel T, Kim KJ, Scaramella LV. Angry and aggressive behavior across three generations: A prospective, longitudinal study of parents and children. *J of Abn Child Psychol.* 2003;31:143–160.
7. Scaramella LV, Conger RD, Simons RL. Parental protective influences and gender-specific increases in adolescent internalizing and externalizing problems. *J of Res on Adolesc.* 1999;9:111–141.
8. Simons RL, Wu C-I, Lin K-H, Gordon L, Conger RD. A cross-cultural examination of the link between corporal punishment and adolescent antisocial behavior. *Criminology.* 2000;28:47–80.
9. Ge X, Conger RD, Cadoret RJ, Neiderheiser JM, Yates W, Troughton E, Stewart MA. The developmental interface between nature and nurture: A mutual influence model of child antisocial behavior and parenting. *Dev Psychol.* 1996;32:574–589.
10. Bohman M. Predisposition to criminality: Swedish adoption studies in retrospect. *Genetics of criminal and antisocial behaviour* (Ciba Foundation Symposium no. 194). GR Bock, JA Goode; Eds. Chichester: Wiley; 1996.
11. Slomkowski C, Rende R, Conger KJ, Simons RL, Conger RD. Brothers, sisters, and delinquency: Aggregation and interaction in early and middle adolescence. *Child Dev.* 2000;72:271–283.
12. Conger KJ, Heylen E, Rende R, Slomkowski C. Older sibling contributions to the delinquency of younger brothers and sisters. *Dev Psychol.* Under review.
13. Conger RD, Rueter MR, Conger KJ. The family context of adolescent vulnerability and resilience to alcohol use and abuse. *Soc Stud of Child.* 1994;6:55–86.
14. Krohn MJ, Thornberry TP. Common themes, future directions. *Taking stock of delinquency: An overview of findings from contemporary longitudinal studies*. TP Thornberry, MD Krohn, Eds. New York: Plenum Publishers; 2002.
15. Conger RD, Rueter MR. Siblings, parents, and peers: A longitudinal study of social influences in adolescent risk for alcohol use and abuse. *Sibling relationships: Their causes and consequences*. GH Brody, Ed., New York: Ablex Publishing; 1996.
16. Scaramella LV, Conger RD, Spoth RL, Simons RL. Evaluation of a social contextual model of delinquency: A cross-study replication. *Child Dev.* 2002;73:175–195.

Community Factors

Robert J. Sampson, Ph.D.

This presentation highlights the association of violence and health-risk behaviors among adolescents with the social characteristics of community and neighborhood contexts. My overall thesis is that we need to treat community contexts as important units of analysis in their own right, which in turn calls for new measurement strategies as well as theoretical frameworks that do not simply treat the neighborhood as a “trait” of the individual. I draw on summaries of the relevant scientific literature¹ along with recent findings from the Project on Human Development in Chicago Neighborhoods (PHDCN) to support this thesis. Special attention is devoted to the following themes:

- Considerable inequality exists between neighborhoods and local communities, especially along dimensions of concentrated poverty and racial segregation.
- Adolescent violence and related health-risking behaviors cluster together at the neighborhood and local community level beyond that expected by chance.²
- These two phenomena are themselves related—community-level predictors common to violence and many health-related outcomes include concentrated poverty, racial segregation, family disruption, and poor quality housing. Although there is uncertainty about causality, the association of concentrated disadvantage with violence is robust.
- Advances in the science of measuring neighborhood contexts (“ecometrics”) have led to a new generation of research designs that tap key social processes that go beyond poverty and race, such as social cohesion, informal social control, intergenerational closure, density of acquaintanceship, and legal cynicism. These and other community social processes can be reliably measured at the community level.³
- A growing body of research suggests that certain social characteristics of communities, such as informal social control and cohesion, predict variations in violence after controlling for standard correlates such as poverty and racial composition.⁴
- Characteristics of surrounding neighborhoods are crucial to understanding violence in any given neighborhood regardless of its internal characteristics.⁵ The mechanisms of racial segregation reinforce spatial inequality in proximity to risk, explaining why black middle-class neighborhoods suffer greater violence than white middle-class neighborhoods—despite similar income profiles. In short, violence is conditioned by the characteristics of spatially proximate neighborhoods, which in turn are conditioned by adjoining neighborhoods in a spatially linked process that ultimately characterizes the entire metropolitan system.

In addition to these themes, I will report recent findings from a multilevel longitudinal study that brings together key individual, family, and neighborhood factors to assess the hypothesis that differential social contexts account for racial and ethnic gaps in adolescent violence.⁶ From 1995 to 2002, the PHDCN collected three panels of data on a diverse sample of subjects (n = 2,974, ages 8–25) living in 180 Chicago neighborhoods, augmented by a separate community survey of 8,782 residents. The results show that the odds of violence are 85 percent higher for blacks compared to whites, whereas Latino violence is about 10 percent lower. Yet the majority of the black–white gap (more than 60 percent) and the entire Latino–white gap are explained by a small set of factors, especially marital status of parents, immigrant generation, and neighborhood characteristics associated with racial segregation.

Overall, an emerging body of evidence suggests that investment in community research designs, while still relatively rare, yields new insights into the problem of adolescent violence and associated health-risking behaviors. The results from this research also suggest that generic interventions to improve neighborhood conditions may reduce racial gaps in violence.

References

1. Sampson RJ, Lauritsen JL. Violent victimization and offending: individual-, situational-, and community-level risk factors. In Reiss AJ Jr, Roth J, eds. *Understanding and Preventing Violence: Social Influences (vol. 3)*. Washington, DC: National Academy Press, National Research Council; 1994:1–114.
2. Sampson RJ. The neighborhood context of well being. *Perspect Biol Med*. 2003;46:S53–S73.
3. Raudenbush S, Sampson RJ. ‘Ecometrics’: toward a science of assessing ecological settings, with application to the systematic social observation of neighborhoods. *Sociol Methodol*. 1999;29:1–41.
4. Sampson RJ, Morenoff JD, Gannon-Rowley T. Assessing neighborhood effects: social processes and new directions in research. *Annu Rev Sociol*. 2002;28:443–478.
5. Morenoff JD, Sampson RJ, Raudenbush S. Neighborhood inequality, collective efficacy, and the spatial dynamics of urban violence. *Criminology*. 2001;39:517–560.
6. Sampson RJ, Morenoff JD, Raudenbush S. Social anatomy of racial and ethnic disparities in violence. *Am J Public Health*. In press.

Preventing Violence and Related Health-Risking Social Behaviors in Adolescents—An Evidence Assessment Report

Michele D. Kipke, Ph.D.

Introduction

In 2003, the Agency for Healthcare Research and Quality commissioned an evidence review from the Southern California Evidence-based Practice Center (SC-EPC) and its partner, Childrens Hospital Los Angeles. The purpose of this review was to systematically examine and synthesize existing scientific evidence to address six key questions related to youth violence: (1) What are the factors that contribute to violence and associated adverse health outcomes in childhood and adolescence? (2) What are the patterns of co-occurrence of these factors? (3) What evidence exists on the safety and effectiveness of interventions for violence? (4) Where evidence of safety and effectiveness exists, are there other outcomes beyond reducing violence? If so, what is known about the effectiveness by age, sex, and race/ethnicity? (5) What are commonalities of the interventions that are effective, and those that are ineffective? (6) What are the priorities for future research? The findings from this review are now summarized in an evidence report entitled “Preventing Violence and Related Health-Risking Social Behaviors in Adolescents.”

The purpose of this presentation is to provide an overall summary of the methods used to conduct this evidence review, as well as to present the findings that relate specifically to the first two of these key questions (i.e., risk factors associated with youth violence and patterns of co-occurrence of these risk factors); priorities for future research related to these two questions will also be discussed. The findings pertaining to remaining questions will be presented in a second presentation.

Methods

Definition. For the purpose of this evidence review, we chose to use the Centers for Disease Control and Prevention’s (CDC) definition of violence (i.e., “threatened or actual physical force or power initiated by an individual that results in, or has a high likelihood of resulting in, physical or psychological injury or death”)¹ Thus, we included the following types of violent behavior as outcome behaviors in our review of the literature: murder or homicide, aggravated assault, nonaggravated assault, rape or sexual assault, robbery, gang fight, physical aggression, psychological injury or harm, and other serious injury or harm. Given our directive to focus very specifically on youth violence as an outcome measure, and in an effort to be consistent with the CDC’s definition of violence, we chose not to include the following behaviors in our definition of youth violence: suicide, verbal aggression, bullying, arson, weapon carrying, externalizing behaviors (e.g., acting out), attitude about violent behavior, youth crime against property or materials (e.g., burglary, theft), or intent to commit violence as outcomes. However, we did examine these behaviors and attitudes if they were reported as risk factors associated with youth violence.

Data sources. We reviewed evidence reported in published articles retrieved from four electronic databases—MEDLINE®, PsychInfo, SocioAbstracts, and ERIC. A systematic search of each database was performed in April/May of 2003, and then again in October/November of 2003 by the National Library of Medicine (NLM).

Study selection. Published articles were eligible for inclusion if they were peer-reviewed, were published in 1990 or thereafter, reported on research conducted in the United States, and if they specifically examined either risk/protective factors associated with youth violence perpetration or the effectiveness of a prevention intervention designed to reduce violence among adolescents, ages 12 to 17 years. Excluded were case reports, editorials, letters, reviews, practice guidelines, non-English language publications, and papers from which no data could be abstracted. To evaluate the literature related to risk factors, we based our assessment on prospective longitudinal cohort studies given that there is general consensus that cross-sectional studies would not allow us to identify temporal predictors of youth violence.

Data extraction. Two independent researchers screened all citations and discrepancies were resolved by consensus. Data were abstracted and recorded onto evidence tables by a member of the team and then double-checked by a senior researcher. All screening and data abstraction used pre-established criteria and guidelines.

Data synthesis. Systematic approaches were used to summarize the findings. When findings for a single cohort were reported in multiple articles, the cohort was considered the unit of analysis. In the summary, findings for one cohort that were reported in more than one article were counted as only one article. However, if several articles reported findings for one cohort but each reported the findings for different outcome measures, each was counted. When a risk factor was assessed using both bivariate and multivariate analysis, the results of the multivariate analysis took precedence. Findings were considered significant if the *p* statistic was less than 0.05.

When summarizing the evidence, we considered a factor to be consistently associated with violence if 75 percent or more of the cohort studies reported a significant association for the factor. Likewise, factors reported not to be associated with violence in at least 75 percent of the studies under consideration were considered not associated with violence. Otherwise, the findings were considered inconclusive. We evaluated consistency for factors that were reported in two or more cohort studies. Evidence was considered inadequate if the results for a particular factor were reported in only one cohort study.

Results

Risk factors associated with youth violence. We screened 11,196 titles and abstracts, reviewed 1,612 full-length articles, and included 67 articles in our evidence assessment and used 35 articles from 23 prospective longitudinal cohort studies for the review. A total of 35 articles, based on 23 prospective cohort studies, were reviewed. These articles covered 11 study populations defined by gender, race/ethnicity, and at-risk youth populations. Findings for specific racial/ethnic groups suffered from small numbers of cohorts or small numbers of subjects.

Across all studies, only one risk factor, being of male gender, was consistently reported to be significantly associated with youth violence perpetration.²⁻⁸ Low family socioeconomic status (SES) was consistently reported not to be an independent risk factor for youth violence.^{3,4,7,9-11} Co-occurrence of family SES with other risk factors was associated with youth violence. There was very little consistency of reported significance or nonsignificance for all other risk factors. Few studies examined a comparable set of risk factors (i.e., risk factors were often examined only by a single study) limiting our ability to draw conclusions based on the available evidence.

Among studies that specifically focused on adolescent males, a consistent finding was the significant association between violence and anger,^{12,13} cigarette smoking,^{14,15} and nonviolent delinquency.^{4,16} For adolescent females, a consistent finding was the significant association between violence and nonviolent delinquency.^{4,11,16}

For research conducted with at-risk youth populations, a consistent finding was the significant association between being Latino and repeated physical aggression among adolescent males;^{17,18} there were no consistent findings for research conducted with at-risk adolescent females.

Patterns of co-occurrence of these risk factors. In addition to our search for *independent* risk factors that have a high likelihood of leading to youth violence, we were also interested in *clusters* of risk factors that may lead to youth violence. We defined co-occurrence of factors as the simultaneous presence of two or more risk or protective factors that, together, predict violence in an individual. We identified five articles on four cohort studies that addressed different aspects of co-occurrences.^{9,14,19-21} A number of factors that were found to be statistically significant when no other risk factors were taken into account were found not to be significant when other risk factors were taken into consideration. For example, low SES or low family income was reported as a significant risk factor associated with youth violence when the co-occurrence of other risk factors was not taken into consideration. But when the effect of other risk factors was taken into consideration, its significance disappeared, implying that the other risk factor(s) were stronger predictor(s) of youth violence than was low SES.^{3,4,7,9-11}

Discussion and Implications for Future Research

The overarching goal of this review was to bring greater scientific rigor to the evaluation process to identify the highest quality research findings in the field of youth violence. With the severely restricted scope of the project, much of the value of this report was the identification of the current status of research on youth violence, the existing research gaps and inconsistencies, and the need for additional scientifically rigorous studies. Despite the limited scope, we identified a voluminous literature that is rather fragmented in nature. We found little agreement with respect to the definitions used to measure youth violence and the ways in which risk/protective factors are conceptualized, operationally defined, measured, analyzed, and reported. As a result, the findings showed little consistency across individual studies and the research literature is not growing cumulatively. Consequently, we are limited in our ability to draw conclusions and make recommendations.

Specifically, for the review of risk factors contributing to youth violence, we were unable to perform a quantitative synthesis for the risk factors by developmental stages, by type of at-risk population, by type of violent outcome, and by type of statistical analysis due to the limited number of prospective cohort studies. Efforts to examine the effects of co-occurrence of risk factors have been limited, although some efforts have been made to examine the multifactorial nature of risk and protective factors contributing to youth violence.

Priorities for future research should include: (1) a national effort to develop comparable approaches to defining, measuring, and analyzing research data related to youth violence; (2) the funding of new initiatives to facilitate the collection of comparable data across multiple sites and with multiple youth populations to permit the use of a combined prospective cohort from which a common standardized dataset could be assembled and analyzed; and (3) the funding of the establishment of natural prospective cohorts and considerations of the use of pseudo prospective cohorts that combine the efforts of the many prospective cohort studies from which a common dataset could be assembled and advanced statistical analysis conducted.

Special efforts are needed to improve the quality of publications, including the consistency and adequacy with which the study characteristics—such as research questions, conceptual framework, study design, and description of the study population—are specified.

Because of the multifactorial nature of the factors contributing to youth violence, alternatives to quantitative synthesis of published information should be sought. Unlike many clinical investigations, studies on youth violence are often multifaceted, involving the efforts of multiple parties (e.g., teachers, parents, and school administrators), requiring long time commitments, and being sensitive to factors that cannot be anticipated. We propose that social science researchers consider an “individual-level-data-meta-analysis” method^{22–26} for future systematic reviews to identify both independent predictors and clusters of predictors that lead to youth violence.

References

1. National Center for Injury Prevention and Control. Youth violence: Overview. Available at: <http://www.cdc.gov/ncipc/factsheets/yvfacts.htm>. Accessed: May 2004.
2. Rivera B, Widom CS. Childhood victimization and violent offending. *Violence Vict.* 1990;5(1):19–35.
3. Roitberg T, Menard S. Adolescent violence: A test of integrated theory. *Stud Crime Crime Prev.* 1995;4(2):177–96.
4. Saner H, Ellickson P. Concurrent risk factors for adolescent violence. *J Adolesc Health.* 1996;19(2):94–103.
5. Komro KA, Williams CL, Forster JL, et al. The relationship between adolescent alcohol use and delinquent and violent behaviors. *J Child Adolesc Subst Abus.* 1999;9(2):13–28.

6. Foshee VA, Bauman KE, Arriaga XB, et al. An evaluation of Safe Dates, an adolescent dating violence prevention program. *Am J Public Health*. 1998;88(1):45–50.
7. Herrenkohl TI, Guo J, Kosterman R, et al. Early adolescent predictors of youth violence as mediators of childhood risks. *J Early Adolesc*. 2001;21(4):447–69.
8. McCloskey LA, Lichter EL. The contribution of marital violence to adolescent aggression across different relationships. *J Interpers Violence*. 2003;18(4):390–412.
9. Herrenkohl RC, Egolf BP, Herrenkohl EC. Preschool antecedents of adolescent assaultive behavior: a longitudinal study. *Am J Orthopsychiatry*. 1997;67(3):422–32.
10. Brezina T. Teenage violence toward parents as an adaptation to family strain: Evidence from a national survey of male adolescents. *Youth Soc*. 1999;30(4):416–44.
11. Herrera VM, McCloskey LA. Gender differences in the risk for delinquency among youth exposed to family violence. *Child Abuse Negl*. 2001;25(8):1037–51.
12. Felson RB. “Kick ‘em when they’re down”: Explanations of the relationship between stress and interpersonal aggression and violence. *Sociol Q*. 1992;33(1):1–16.
13. Foshee VA, Linder F, MacDougall JE, et al. Gender differences in the longitudinal predictors of adolescent dating violence. *Prev Med*. 2001;32(2):128–41.
14. Dornbusch SM, Lin I-C, Munroe PT, et al. Adolescent polydrug use and violence in the United States. *Int J Adolesc Med Health*. 1999;11(3-4):197–219.
15. Ellickson PL, Tucker JS, Klein DJ. High-risk behaviors associated with early smoking: results from a 5-year follow-up. *J Adolesc Health*. 2001;28(6):465–73.
16. Becker KB, McCloskey LA. Attention and conduct problems in children exposed to family violence. *Am J Orthopsychiatry*. 2002;72(1):83–91.
17. Loeber R, Wei E, Stouthamer-Loeber M, et al. Behavioral antecedents to serious and violent offending: Joint analyses from the Denver Youth Survey, Pittsburgh Youth Study and the Rochester Youth Development Study. *Stud Crime Crime Prev*. 1999;8(2):245–63.
18. Loeber R, Wung P, Keenan K, et al. Developmental pathways in disruptive child behavior. *Dev Psychopathol*. 1993;5(1-2):103–33.
19. Piquero A, Tibbetts S. The impact of pre/perinatal disturbances and disadvantaged familial environment in predicting criminal offending. *Stud Crime Crime Prev*. 1999;8(1):52–70.
20. Borowsky IW, Ireland M, Resnick MD, et al. Violence risk and protective factors among youth held back in school. *Ambul Pediatr*. 2002;2(6):475–84.
21. Beyers JM, Loeber R, Wikstrom PO, et al. What predicts adolescent violence in better-off neighborhoods? *J Abnorm Child Psychol*. 2001;29(5):369–81.

22. Olkin I, Sampson A. Comparison of meta-analysis versus analysis of variance of individual patient data. *Biometrics*. 1998;54(1):317–22.
23. Mathew T, Nordstrom K. On the equivalence of meta-analysis using literature and using individual patient data. *Biometrics*. 1999;55(4):1221–3.
24. Stewart LA, Clarke MJ. Practical methodology of meta-analyses (overviews) using updated individual patient data. Cochrane Working Group. *Stat Med*. 1995;14(19):2057–79.
25. Stewart LA, Parmar MK. Meta-analysis of the literature or of individual patient data: is there a difference? *Lancet*. 1993;341(8842):418–22.
26. Nagin D, Tremblay RE. Trajectories of boys' physical aggression, opposition, and hyperactivity on the path to physically violent and nonviolent juvenile delinquency. *Child Dev*. 1999;70(5):1181–96.

Evidence for Cumulative Developmental Models

Rolf Loeber, Ph.D.

The field of studies on violence is faced with contradictory results. On the one hand, meta-analyses indicate a high degree of replication of one-to-one associations between risk factors/predictors and later violence.¹ However, results from multivariate analyses based on multiple predictors vary much from study to study. This is partly caused by studies that sample a narrow, often idiosyncratic, range of all known predictors. Also missing is an overarching conceptualization across different studies with different prediction tools.

It is proposed that advances in the prediction of violence are possible through the formulation of a novel model that takes into account six key findings: (1) pathways toward violence; (2) individuals' exposure to an accumulation of risk factors over time; (3) dose–response relationship between risk factors and violence; (4) reduction of risk of violence through exposure to promotive (i.e., protective) factors; (5) individuals' differences in exposure to risk and promotive factors at birth (called start-up factors); (6) individual factors—compared to family, peer, school, and neighborhood factors—as the most important in the explanation of who escalates from violence to homicide and in the explanation of desistance over time.

Each finding will be discussed briefly. First, research on developmental pathways to violence shows that the majority of individuals who become violent during adolescence tend to have followed a pathway earlier in their life that started with minor forms of nonphysical aggression, later physical aggression, and eventually violence.² A slightly different model assumes that a small percentage of youth do not outgrow age-normative aggression during the preschool years,³ and then escalate in the severity of their aggression over time. Both models have in common the assumption that escalation to violence is gradual and can take many years.

The second finding, although less thoroughly investigated, is that predictors/risk factors of violence gradually emerge in individuals' lives.⁴ From childhood to early adulthood, the range of predictors tends to expand across different domains of influences. Eventually, the range covers individual, family, peer, school, and neighborhood factors.

The third component consists of the finding that no single risk factor or predictor can explain why some individuals and not others become violent. Instead, research findings support the notion that there is a dose–response relationship between the number of risk factors and the probability of later deviance⁵ and violence.⁶ This means that we need to document individual differences in the accumulation of risk factors during development.

The fourth issue rests on the finding that certain factors are associated with a lowering of later risk of violence. These factors, referred to here as promotive factors (also known as protective factors), are thought to accumulate from childhood to early adulthood; more such factors are available later in life. It is also thought that risk and promotive factors operate in concert. That is, the total number of factors matters, but at the same time promotive factors

buffer the impact of risk factors.⁵ Thus, the eventual probability of violence is the result of the balance between risk and promotive factors.⁷

The fifth component is that certain risk and promotive factors are already present before or at birth. However, children differ in their exposure to risk and promotive factors. That is, risk factors tend to prevail for those on a pathway from minor aggression to violence, whereas protective factors tend to prevail for those are unlikely to escalate to violence.

The final component refers to the types of predominant risk/promotive factors that can explain escalation to violence and desistance in violence. It was generally thought that risk factors are interchangeable and that risk factors from the domains of the individual, family, peer, school, and neighborhood all contributed to the risk of violence. This conceptualization is too broad; instead, evidence suggests that individual factors are mostly associated with escalation processes from violence to homicide.⁸ Similarly, de-escalation is thought to depend primarily on changes in individual factors and secondarily on changes in factors from the other domains.⁹

The six components are brought together into a single, three-dimensional cumulative, developmental model. This model is an advance over existing models in presenting the currently known *outer* boundaries for the interrelationships among developmental pathways to violence, risk, and protective factors associated with violence. Individuals' escalation to violence can be mapped within this model as a function of risk and protective factors. A second advantage of the model is that practitioners and policymakers can easily understand the model, unlike most statistical models, thus facilitating the communication of key aspects relating to juveniles' escalation to violence. The model also has clear implications for the evaluation of change, whether occurring naturally or through prevention or remediation.

References

1. Lipsey MW, Derzon JH. Predictors of violent or serious delinquency in adolescence and early adulthood: a synthesis of longitudinal research. In Loeber R, Farrington DP, eds., *Serious and Violent Juvenile Offenders: Risk Factors and Successful Interventions*. Thousands Oaks, CA: Sage Publications;1998:86–105.
2. Loeber R, Wung P, Keenan K, Giroux B, Stouthamer-Loeber M, Van Kammen, WB, Maughan B. Developmental pathways in disruptive child behavior. *Dev Psychopathol.* 1993;5,101–132.
3. Tremblay RE. Why socialization fails. The case of chronic physical aggression. In Lahey BB, Moffitt TE, Caspi A, eds., *Causes of Conduct Disorder and Juvenile Delinquency*. New York: Guilford Press;2003:182–224.
4. Loeber R. (1985). Patterns and development of antisocial child behavior. In Whitehurst GJ, ed., *Annals of Child Development, vol. 2*. Greenwich, CT: JAI Press;1985:77–116.

5. Sameroff AJ. Ecological perspectives on developmental risk. In Osofsky JD, Fitzgerald HE, eds., *Infant Mental Health in Groups at High Risk. WAIMH Handbook of Infant Mental Health, vol. 4*. New York: Wiley;1999:233–248.
6. Loeber R. Development pathways and cumulative risk/protective models. Paper presented at: Meeting of the International Society for the Study of Behavior Development; July 2004; Ghent, Belgium.
7. Stouthamer-Loeber M, Loeber R, Wei E, Farrington DP, Wikström P-OH. (2002). Risk and promotive effects in the explanation of persistent serious delinquency in boys. *J Clin Consult Psychol*. 2002;70:111–123.
8. Loeber R, Homish DL, Wei EH, Pardini D, Crawford AM, Farrington DP, Stouthamer-Loeber M, Creemers J, Koehler, SA, Rosenfeld R. The prediction of violence and homicide in young males. *J Clin Consult Psychol*. In press.
9. Stouthamer-Loeber M, Wei EH, Loeber R, Masten A. Desistance from persistent serious delinquency in the transition to adulthood. *Dev Psychopathol*. In press.

Multiple Behavior Problems and Shared Risk

Deborah M. Capaldi, Ph.D.

“Comorbidity” of psychopathology is a term that refers to an individual meeting the criteria for more than one psychiatric diagnosis. For youth with diagnosed conduct disorder, comorbid conditions contribute to their distress and functional impairment and complicate their treatment. “Co-occurrence” is a term that refers to the significant association of two behaviors, often measured by continuous scales. The behaviors that are the main focus of this paper include antisocial behavior, general delinquency, violence, substance use, and risky sexual behavior—all externalizing behaviors. The main internalizing behavior considered is depression.

The Conduct Problem Cluster

Youth who show higher levels of conduct problems tend to show an accelerated life-course to adult roles, which relates to the co-occurrence of problem behaviors at adolescence. Such youth tend to drop out of school¹ and take on certain adult-like behaviors, such as sexual intercourse,² substance use,³ and roles such as parenthood⁴ at earlier ages than usual. Jessor and Jessor hypothesized a syndrome of problem behavior.⁵ The common element to the behaviors is that they are defined as undesirable by the social norms of conventional society. Associations across behaviors within the externalizing cluster are particularly strong. However, associations between externalizing and internalizing behaviors, particularly depression, are also surprisingly strong.⁶ Multiproblem youth are a relatively small proportion of youth, but they account for a relatively large proportion of problem behaviors.⁷

Gottfredson and Hirschi⁸ posit that there is a single underlying propensity factor driving deviant behavior, namely lack of self-control. However, some differences in patterns and strength of predictors and the presence of predictive associations among the behaviors themselves suggest that they are highly associated but not identical.

Developmental Systems Explanations

Developmental systems theories emphasize the causal role of continuous interaction of all levels of the developing system from the molecular to the cultural, with a particular focus on individual—environmental transactions. Bronfenbrenner⁹ conceptualized a hierarchy of four nested systems involving intrapersonal factors, microsystems of face-to-face interactions, proximal contextual factors and behavioral settings, and finally macrocontextual factors. There is evidence for shared influences related to co-occurrence at each of these levels, as risk factors show associations with multiple problem behavior outcomes and also show interrelationships. Some brief examples of shared risk are given for each level.

At the intrapersonal level, the co-occurrence of problem behaviors is partly due to shared temperamental tendencies such as a relatively high activity level, poor inhibitory control, a

greater vulnerability to feelings of negative affect and anger, and a higher tolerance for risk taking.¹⁰ Temperament risk is hypothesized to be due to genetic factors. High activity level appears to be a risk factor for both conduct disorder and risky sexual behavior.¹¹

At the second level, social transactions, particularly with parents in childhood and with peers in later childhood and adolescence, are key factors that have been demonstrated in many studies to be related to multiple problem behaviors.¹² Positive parental involvement, structure, monitoring and discipline, and the absence of harsh discipline are associated with lower risk for problem behaviors and depression.¹³ Rejection by prosocial peers¹⁴ and associations with peers who engage in problem behaviors are also a risk factor for these associated problem behaviors, and it is within these peer groups that many other problem behaviors are initiated, practiced, and reinforced.¹⁵

At Level 3, contextual risk factors impinge on the family—particularly low income, unemployment, low parental socioeconomic status, parental antisocial behavior, parental stress, parental depression, and the number of parental transitions (e.g., divorces). These factors are interrelated, partly due to continuity in family social deprivation and causal associations between the outcomes. Neighborhood risk also affects families, is associated with the density of delinquent peers, and provides settings for peer group interactions.

At Level 4, societal and cultural risk factors also show shared associations with problem behaviors. Norms and messages regarding the appropriateness of behaviors such as violence, substance use, and sexual involvement at adolescence tend to be associated. Television violence predicts violent behavior.¹⁶ Such norms also differ among cultural groupings, as well as for boys versus girls.

Studies of transactions between the factors at each level have elucidated some processes, such as selection into deviant social settings¹⁷ and the failure model,¹⁸ which posits that antisocial youth are vulnerable to additional problems (e.g., adolescent pregnancy and depressed mood), in part because their conduct problems result in developmental failures (e.g., the failure to develop social and academic skills yet selection into higher risk contexts).

Conclusions

There is strong evidence for shared predictors of co-occurring problem behaviors, but also evidence for specific predictors and for causal effects among the co-occurring behaviors themselves. However, further work is required to delineate patterns of co-occurrence, predictors, and processes across the early life course. Prevention and treatment programs for each of these behaviors should be designed based on co-occurrence issues.

References

1. Elliott DS, Voss HL. *Delinquency and Dropout*. Lexington, MA: Lexington Books;1974.
2. Capaldi DM, Crosby L, Stoolmiller M. Predicting the timing of first sexual intercourse for at-risk adolescent males. *Child Dev*. 1996;67:344–359.
3. Dishion TJ, Capaldi DM, Yoerger K. Middle childhood antecedents to progression in male adolescent substance use: an ecological analysis of risk and protection. *J Adolesc Res*. 1999;14:175–206.
4. Scaramella LV, Conger RD, Simons RL, Whitbeck LB. Predicting risk for pregnancy by late adolescence: a social contextual perspective. *Dev Psychol*. 1998;34:1233–1245.
5. Jessor R, Jessor SL. *Problem Behavior and Psychosocial Development: A Longitudinal Study of Youth*. New York: Academic Press;1977.
6. Angold A, Costello E J, Erkanli A. Comorbidity. *J Child Psychol Psychiatry*. 1999;40:57–87.
7. Biglan A, Brennan PA, Foster SL, Holder HD. *Helping adolescents at risk: Prevention of multiple problem behaviors*. Guilford Press: New York;2004.
8. Gottfredson MR, Hirschi T. *A General Theory of Crime*. Stanford, CA: Stanford University Press;1990.
9. Bronfenbrenner U. Ecology of family as a context for human development: research perspectives. *Dev Psychol*. 1986;22:723–742.
10. Lahey BB, Waldman ID. The developmental propensity model of the origins of conduct problems during childhood and adolescence. In Lahey BB, Moffitt TE, Caspi A, eds. *Causes of Conduct Disorder and Juvenile Delinquency*. New York: Guilford Press;2003.
11. Capaldi DM. Onset and lifetime heterosexual HIV risk behaviors in young adult males at risk for antisocial behavior. Paper presented at: National Institute on Drug Abuse Conference on Linking Drug Abuse and HIV Prevention in Youth; April 2004, Washington, DC.
12. Patterson GR, Reid JB, Dishion TJ. *A Social Learning Approach: Antisocial Boys (vol 4)*. Eugene, OR: Castalia Publishing;1992.
13. Kim IJ, Ge X, Brody GH, Conger R, Gibbons FX, Simons RL. Parenting behaviors and the occurrence and co-occurrence of depressive symptoms and conduct problems among African American children. *J Fam Psychol*. 2003;17:571–583.
14. Coie JD, Dodge K. Multiple sources of data on social behavior and social status in the school: a cross-age comparison. *Child Dev*. 1988;59:815–829.
15. Dishion TJ, Spracklen KM, Andrews DW, Patterson GR. Deviancy training in male adolescent friendships. *Behav Ther*. 1996;27:373–390.

16. Huesmann LR, Moise JF, Podolski CP. The effects of media violence on the development of antisocial behavior. In Stoff DM, Breiling J, Maser JD, eds., *Handbook of Antisocial Behavior*. New York: Wiley;1997.
17. Dishion TJ, Patterson GR, Stoolmiller M, Skinner ML. Family, school, and behavioral antecedents to early adolescent involvement with antisocial peers. *Dev Psychol*. 1991;27:172–180.
18. Wiesner M, Kim HK, Capaldi DM. Young adult outcomes of different offender trajectories: psychopathy, alcohol use, drug use, and depressive symptoms. *Dev Psychopathol*. In press.

Implications for Intervention

Richard F. Catalano, Ph.D.

Prevention science, a discipline built on the integration of life course development research, community epidemiology, and preventive intervention trials, is based on the premise that empirically verifiable precursors predict the likelihood of violence and other undesired health outcomes. Crime and violence, drug abuse, school dropout, and risky sexual behavior are pressing problems that co-occur in individuals and neighborhoods and are predicted by common precursors. Precursors, in individuals and their environments, include risk factors that predict an increased likelihood of problems and protective factors that mediate or moderate exposure to risk in predicting decreased likelihood of problems. There is much overlap in these risk and protective factors for different problem behaviors. Furthermore, research indicates that different risk factors appear to be particularly salient at different developmental stages. This suggests that the prevention of problem behavior may require a developmental continuum of appropriate prevention efforts that involve multiple approaches and agencies.

Prevention science postulates that negative health outcomes can be prevented by reducing or eliminating risk factors and enhancing protective factors in individuals and their environments during the course of development. A growing number of interventions have been found to be effective in preventing adolescent violence and other problem behaviors by reducing risk and enhancing protection.

Despite the advances in the science base for effective preventive interventions and the investments in community-wide preventive interventions, many communities continue to invest in prevention strategies with limited evidence of effectiveness. Translating prevention science into community prevention service systems has emerged as a priority for prevention services research. To reduce the prevalence of violence, substance abuse, and related problems, methods for taking to scale in communities effective prevention policies and programs are needed. Because of limited resources for such widespread implementation, it becomes imperative to use methods for focusing effective strategies to address the most pressing needs of local populations. Going to scale requires effectively mobilizing various sectors of communities to be in concert on widespread implementation of effective prevention strategies. Effective targeting of proven prevention strategies requires methods for assessing and prioritizing specific risk and protective factors in local community areas and matching effective interventions to these priorities.

Prenatal and Infancy Home Visiting by Nurses

David Olds, Ph.D.

Our team has conducted three randomized controlled trials of a program of prenatal and infancy home visiting by nurses for low-income women with no previous live births. The program is known today as the Nurse Family Partnership. The first trial, conducted in Elmira, NY, enrolled a primarily white sample (N = 400). The second, conducted in Memphis, TN, enrolled a primarily black sample (N = 1138 for pregnancy and 743 for infancy phases). The third, conducted in Denver, CO (N = 735), registered a large sample of Hispanics (46 percent) and systematically examined the impact of the program when delivered by paraprofessionals and by nurses. Each of the trials registered a large portion of the populations in the target communities.

In each of the three trials, women were randomized to receive either comparison services or home visiting by nurses during pregnancy and the first 2 years of their children's lives. The comparison services (consisting of some combination of free transportation for prenatal and well-child care and developmental screening and referral services) varied by trial. The home visiting program was essentially the same in each of the trials. In their home visits, the nurses had three major goals: (1) to improve the outcomes of pregnancy by helping women improve their prenatal health; (2) to improve the child's health and development by helping parents provide competent care of the child; and (3) to improve the family's economic self-sufficiency by helping parents develop a vision for the future and make concrete plans for accomplishing their goals, with a particular emphasis on planning subsequent pregnancies, completing their educations, finding work, and involving fathers, when possible. Figure 1 illustrates the process through which the program was expected to affect the child.

Consistent Findings Across Trials

High rates of sample retention in the trials increase the validity of treatment contrasts. In at least two of the three trials, the nurse-visited group, compared to controls experienced: (1) a reduction in number of cigarettes smoked per day over the course of pregnancy; (2) a reduction in number of subsequent pregnancies and increase in interval between first and second births; (3) an increase in women's employment; (4) an increase in the father's involvement in the family; (5) a reduction in use of welfare; (6) an improvement in quality of parent–infant dyadic interaction and growth-promoting qualities of the home environment; (7) a reduction in number of health care encounters for injuries or ingestions; and (8) an improvement in children's school readiness, indicated by superior language and cognitive development and executive functioning. Program effects on caregiving and child outcomes were greater for families in which the mother had low psychological resources (limited belief in their control over life circumstances, limited intellectual functioning, and high rates of mental health symptoms) at registration.

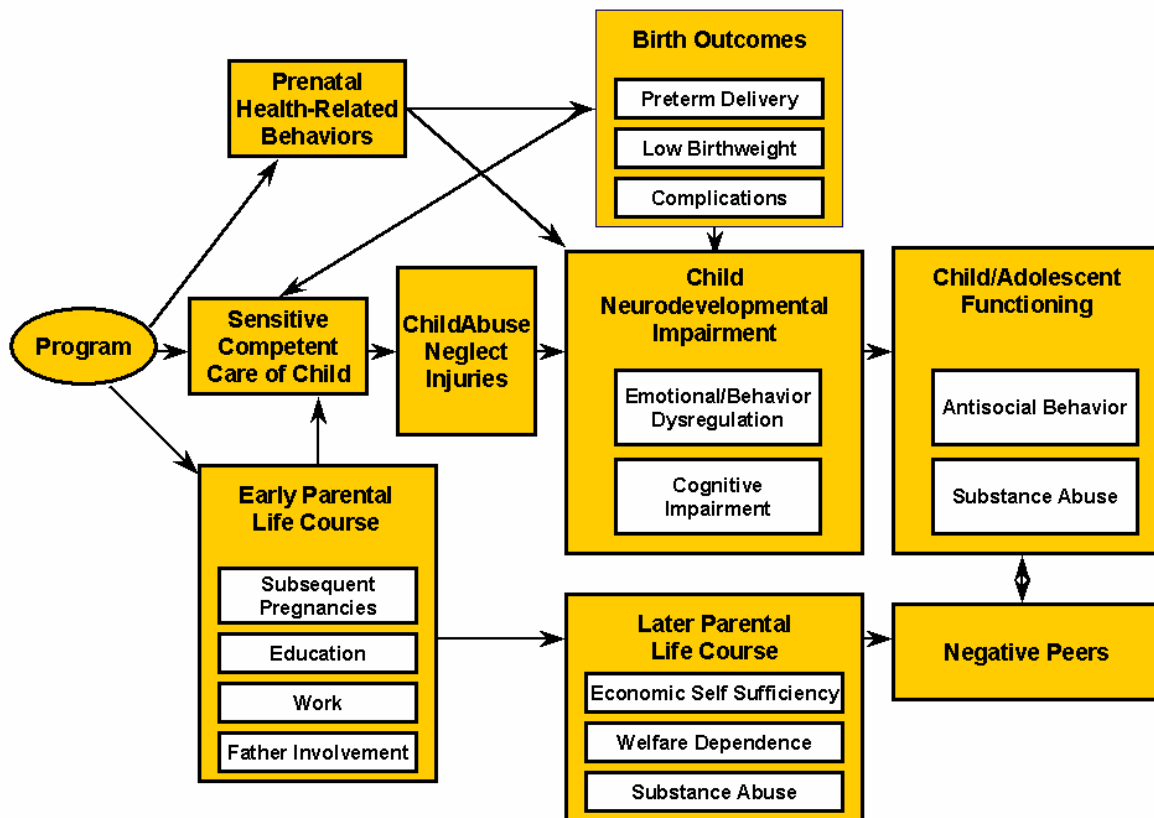


Figure 1. Model of program influences on risks for and indicators of dysregulated child behavior.

Unique Findings in Elmira, Memphis, and Denver

In the Elmira trial, nurse-visited, low-income, unmarried women, in contrast to control-group counterparts, had 79 percent fewer State-verified reports of child abuse and neglect, 44 percent fewer behavioral problems due to use of drugs and alcohol, and 69 percent fewer arrests by their first-born child’s 15th birthday. Their 15-year-old children, compared to control-group counterparts, had 54 percent fewer arrests, 81 percent fewer convictions, 63 percent fewer sexual partners, and 56 percent less consumption of alcohol.

In Memphis, nurse-visited 6-year-old children born to mothers with low psychological resources, in contrast to control-group counterparts, had lower rates of dysregulated aggression and incoherent stories in response to the MacArthur Story Stem Battery. Moreover, nurse-visited children overall were reported by their mothers to have fewer behavioral problems in the borderline or clinical range on the Achenbach Total Problems Scale.

In Denver, the nurses produced effects approximately twice as large as those produced by paraprofessional visitors following essentially the same program model.

National Replication Work

Since 1997, we have been replicating the program throughout the United States, giving careful attention to reproducing the essential elements of the program tested in the trials and to monitoring and improving program implementation.

References

- Bretherton I, Oppenheim D. The MacArthur Story Stem Battery: Development, administration, reliability, validity, and reflections about meaning. In R. Emde, D. Wolf, & D. Oppenheim (Eds.), *Revealing the Inner Worlds of Young Children: The MacArthur Story Stem Battery and Parent-Child Narratives*. New York: Oxford;2003:55–80.
- Kitzman H, Olds DL, Henderson CR Jr, Hanks C, Cole R, Tatelbaum R, McConnochie KM, Sidora K, Luckey DW, Shaver D, Engelhardt K, James D, Barnard K. Effect of prenatal and infancy home visitation by nurses on pregnancy outcomes, childhood injuries, and repeated childbearing. A randomized controlled trial. *JAMA*. 1997;278(8):644–52.
- Kitzman H, Olds DL, Sidora K, Henderson CR Jr, Hanks C, Cole R, Luckey DW, Bondy J, Cole K, Glazner J. Enduring effects of nurse home visitation on maternal life course: A 3-year follow-up of a randomized trial. *JAMA*. 2000;283(15):1983–9.
- Olds D, Henderson CR Jr, Cole R, Eckenrode J, Kitman H, Luckey D, Pettitt L, Sidora K, Morris P, Powers J. Long-term effects of nurse home visitation on children’s criminal and antisocial behavior: 15-year follow-up of a randomized controlled trial. *JAMA*. 1998;280(14):1238–44.
- Olds D, Kitman H, Cole R, Robinson J, Sidora K, Luckey D, Henderson C, Hanks C, Bondy J, Holmberg J. Effects of nurse home visiting on maternal life-course and child development: Age-six follow-up of a randomized trial. *Pediatrics*. In press.
- Olds DL, Eckenrode J, Henderson CR Jr, Kitman H, Powers J, Cole R, Sidora K, Morris P, Pettitt LM, Luckey D. Long-term effects of home visitation on maternal life course and child abuse and neglect. Fifteen-year follow-up of a randomized trial. *JAMA*. 1997;278(8):637–43.
- Olds DL, Hill PL, O’Brien R, Racine D, Moritz P. (2003). Taking preventive intervention to scale: The Nurse-Family Partnership. *Cognitive and Behavioral Practice*. 2003;10(4):278–290.
- Olds DL, Robinson J, O’Brien R, Luckey DW, Pettitt LM, Henderson CR Jr, Ng RK, Sheff KL, Korfmacher J, Hiatt S, Talmi A. Home visiting by paraprofessionals and by nurses: A randomized, controlled trial. *Pediatrics*. 2002;110(3):486–96.
- Olds DL, Robinson J, Pettitt L, Luckey D, Holmberg J, Ng R, Isacks K, Sheff K. Effects of home visits by paraprofessionals and by nurses: Age-four follow-up of a randomized trial. *Pediatrics*. In press.

Olds DL. Prenatal and infancy home visiting by nurses: From randomized trials to community replication. *Prev Sci.* 2002;3(3):153–72.

Pettitt LM, Olds DL, Luckey DW, Sidora K, Henderson CR Jr. Marriage and nurse home visitation for first-time pregnant women from a fifteen-year followup of a randomized trial. (Under review.)

FAST Track

Kenneth A. Dodge, Ph.D., and Conduct Problems Prevention Research Group

A consensus developmental theory has identified a group of early-starting, chronically antisocial children who are known to be at high risk for serious conduct disorder in adolescence, at a per-child cost to society estimated at 1.2 to 2 million dollars. This empirically based theory posits that a group of high-risk youth can be identified as early as age 5 but that potentiation of their risk depends on subsequent life experiences in parenting, peer, academic, and social-cognitive domains. The Fast Track preventive intervention was developed based on the hypothesis that early, sustained intervention with high-risk youth in these domains could prevent serious conduct disorder and antisocial behavior in adolescence. The Fast Track randomized prevention trial was conducted to test this hypothesis.

Developmental theory has pointed toward potential domains for preventive intervention with high-risk youth. It is posited that parenting behaviors at key points across childhood exacerbate antisocial behavior in high-risk youth. Specifically, during the early elementary-school years, harsh and inconsistent discipline strategies, lack of parent-child warmth, and low parental involvement in schooling have been identified as key factors. During the middle-school years, monitoring and supervision of a child's behavior and progress are added as factors in antisocial development. In the peer domain, major tasks of the elementary-school years include establishment of mutual dyadic friendships, acceptance by the mainstream peer group, and immersion in a peer culture that fosters social competence. During the middle-school years, crucial tasks include association with prosocial peer groups. Children who lack dyadic friendships or are socially rejected in elementary school and who associate with deviant peer groups in middle school are at heightened risk for antisocial outcomes. In the academic domain, children who fail to learn to read during the elementary-school years and who fail to establish consistent organizational and study skills in middle school are at heightened risk. In the social-cognitive domain, elementary-school children who become aggressive are those who are unable to recognize emotions accurately in themselves and others, who inaccurately attribute hostile intent to peers, who are unable to solve social problems competently, and who evaluate the likely outcomes of aggressing as favorable and of withholding aggression as unfavorable. During the middle-school years, social-cognitive tasks grow to include establishment of reasonable life goals, plans to work toward those goals across time, and positive role models for behavior.

The Fast Track program was created to target all of these risk factors in a coordinated fashion by intervention with high-risk youth, their parents, their teachers, and their peer groups across a 10-year period. After identification of high-risk youth at the end of the kindergarten year, intervention begins in grade 1 with parent skill-training groups, social-cognitive skill-training groups with youth, peer coaching to foster dyadic relationships, academic tutoring in reading skills, teacher consultation, and universal classroom-wide curricula. These interventions continue through the end of elementary school and evolve into individually tailored interventions through grade 10.

Efficacy of the Fast Track intervention has been tested through a randomized trial. A total of 9,341 kindergarteners from 55 high-risk schools at four geographic sites (Durham, NC; Nashville, TN; Seattle, WA; and rural PA) in three cohorts (1991, 1992, and 1993) were screened through a multiple-gating strategy with teachers and parents to identify 891 early-starting, high-risk youth (69% male; 45% African American). These youth were assigned randomly (at the level of school) to receive the Fast Track intervention (n = 445) or to be followed as no-treatment controls (n = 446). The controls were allowed to receive whatever intervention the local context offered. Contrasts between groups at pretreatment indicated differences at no greater than chance rates. Intervention began in grade 1 and continued through grade 10. Although dosage varied across children and domains through both self-selection and intentional plans, 98 percent of the parents of children assigned to the intervention condition signed the consent to participate in the intervention. About 75 percent of the families received at least 75 percent of the planned intervention sessions. Measurements were collected annually with children, parents, teachers, peers, condition-blind observers, clinical interviews, and administrative records. By grade 9 (the last point of evaluation for the current report), 85 percent of the sample continued to contribute data.

An intent-to-treat evaluation design ensured that all children assigned to the intervention condition were included in all analyses. Thus, the evaluation was of both the interventionists' ability to attract families to participate and the impact of intervention. Because children were nested within classroom and school groups, a hierarchical linear model (HLM) analytic design was implemented during the early years when interdependencies in data were likely. This design included 23 time-1 covariates (e.g., sex, ethnicity, socioeconomic status, behavior-problem scores) at level 1 (the child) and site, cohort, and intervention condition at level 2 (the classroom).

Analyses revealed that intervention condition was associated with positive proximal outcomes during the elementary-school years in each of the four domains targeted for intervention. In the parenting domain, when compared with control-group children, children assigned to intervention had parents who displayed less use of physical punishment and greater use of appropriate discipline methods as rated by condition-blind observers. In the peer-relations domain, when compared with control-group children, children assigned to intervention received higher peer social-preference scores during elementary school and lower scores for association with drug-using peers in middle school. In the academic domain, when compared with control-group children, children assigned to intervention received higher scores on the Spache test of reading skills and higher Language Arts grades as reflected in school records. In the social-cognitive domain, when compared with control-group children, children assigned to intervention received higher scores in a test of emotion recognition skills and lower scores in tests of hostile attributional biases, aggressive-response problemsolving, and endorsement of aggressive retaliation. The effect sizes for these analyses ranged from 0.15 to 0.53.

Evaluation of aggressive behavior and conduct problems during the late elementary-school years also revealed favorable effects of assignment to intervention, as reflected in measures with parents, teachers, and condition-blind observers on the school playground, with effect sizes of about 0.3. Evaluation of self-reports of illicit substance use during grades 7–9 also indicated favorable effects of intervention. Evaluation of “caseness” revealed that at the end of

elementary school, 29 percent of control-group children met criteria for conduct-problem caseness, in contrast with just 22 percent of children assigned to intervention.

These single-point evaluations do not reflect altered trajectories of development across time. Latent-class growth-curve analyses were conducted with seven measures of aggressive behavior across six time points to reveal several profiles of development across time. These analyses revealed that the children assigned to intervention were only two-thirds as likely as control-group children to remain in a chronically high antisocial trajectory group; thus, they were more likely to desist in their antisocial behavior across time.

At the end of grade 9, trained interviewers completed psychiatric interviews using the Diagnostic Interview Schedule for Children. As shown in Figure 1, when compared with control-group children, both male and female children assigned to intervention were about one-third less likely to receive psychiatric diagnoses of conduct disorder (or Oppositional-Defiant Disorder). Furthermore, the rates for children assigned to intervention did not differ significantly from the population rates for the same schools and neighborhoods.

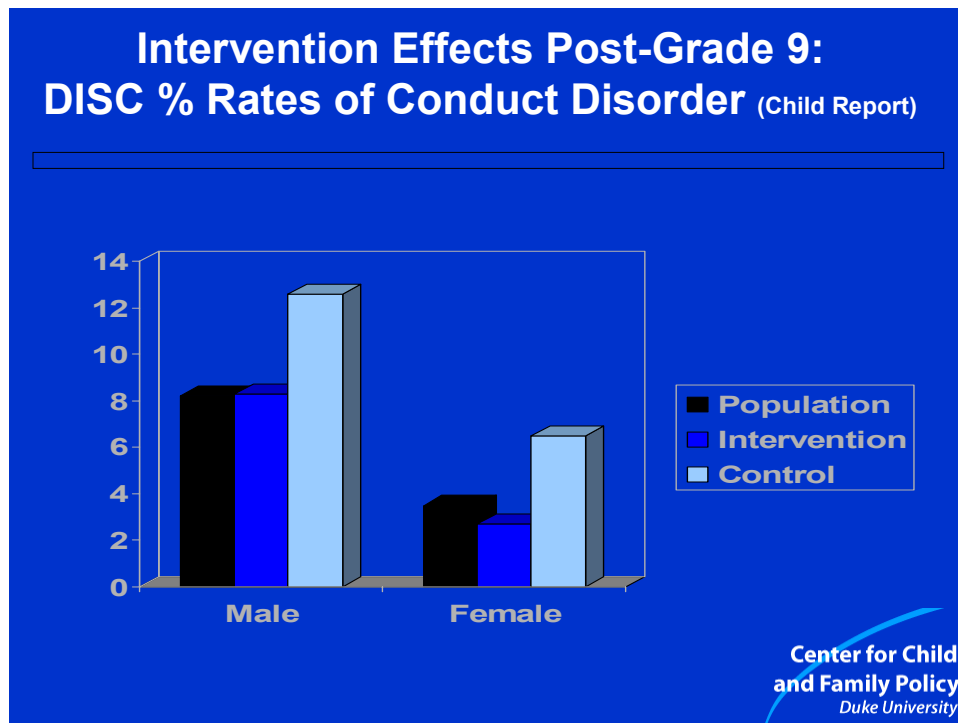


Figure 1

These findings indicate that theory-based comprehensive intervention administered over a 10-year period can be efficacious in preventing psychiatric conduct disorder, with modest effect sizes. At a per-child intervention cost of about \$50,000, this intervention is likely to be cost-beneficial if it can reduce the chronic criminal outcome rate by just 4 percentage points (a modest

effect size). The analyses through early high school indicate that such effects are likely, thus supporting the economic case for preventive intervention with early-starting high-risk youth.

References

Cohen MA. The monetary value of saving a high-risk youth. *J Quant Criminol*. 1998;14:5–33.

Conduct Problems Prevention Research Group. A developmental and clinical model for the prevention of conduct disorders: The FAST Track Program. *Dev Psychopathol*. 1992;4:509–527.

Conduct Problems Prevention Research Group. The effects of the Fast Track Program on serious problem outcomes at the end of elementary school. *J Clin Child Adolesc Psychol*. In press.

Conduct Problems Prevention Research Group. Evaluation of the first three years of the Fast Track Prevention Trial with children at high risk for adolescent conduct problems. *J Abnorm Child Psychol*. 2002;30:19–35.

Conduct Problems Prevention Research Group. The implementation of the Fast Track Program: An example of a large-scale prevention science efficacy trial. *J Abnorm Child Psychol*. 2002;30:1–17.

Conduct Problems Prevention Research Group. Initial impact of the Fast Track Prevention Trial for Conduct Problems: I. The high-risk sample. *J Consult Clin Psychol*. 1999;67:631–647.

Conduct Problems Prevention Research Group. Initial impact of the Fast Track Prevention Trial for Conduct Problems: II. Classroom effects. *J Consult Clin Psychol*. 1999;67:648–657.

Conduct Problems Prevention Research Group. Predictor and moderator variables associated with positive Fast Track outcomes at the end of third grade. *J Abnorm Child Psychol*. 2002;30:37–52.

Conduct Problems Prevention Research Group. Using the Fast Track Randomized Prevention Trial to test the early-starter model of the development of serious conduct problems. *Dev Psychopathology*. 2002;14:927–945.

Moffitt, T.E. Adolescence-limited and life-course-persistent antisocial behavior: A development taxonomy. *Psychol Rev*. 1993;100:674–701.

Good Behavior Game (GBG)

**Sheppard G. Kellam, M.D., Jeanne Poduska, Sc.D.,
C. Hendricks Brown, Ph.D., Carla Ford, Ph.D.,
Amy Windham, Ph.D., Natalie Keegan, John Reid, Ph.D.,
Nicholas Ialongo, Ph.D., Hanno Petras, Ph.D.**

Over the past three decades, evidence from developmental epidemiological studies has consistently identified aggressive, disruptive behavior in the classroom and school, at least as early as first grade, as a risk factor for later aggressive, violent, and criminal behavior, substance abuse, comorbid mental disorders, and high-risk behaviors during adolescence and adulthood.¹⁻⁹

These antecedent behaviors are strongly related to a set of other risk factors that together increase the risk of the later problem outcomes noted above. Poor academic achievement; ineffective parenting around discipline and homework; classroom environments with high levels of aggressive, disruptive behavior; associating with antisocial classmates and peers; poverty at the family level and at the school and community levels—all have been found to increase the risk of early aggressive, disruptive behavior and to increase the risk of poor outcomes in adolescence and adulthood.¹⁰⁻¹²

The prevention research strategy that has emerged from this research has been to attempt to reduce the early risk factor and determine if the risk of the long-term problem outcome has been improved.^{13,14} In Baltimore, three generations of developmental, epidemiologically based, randomized field trials have been done that focused on testing a method for classroom behavior management administered by teachers—the Good Behavior Game (GBG). It was aimed at socializing children into the role of student and decreasing aggressive, disruptive behavior in the 1st- and 2nd-grade classrooms. In the first generation of trials, we trained teachers to administer the GBG classroom-wide over 1st and 2nd grades. Then we followed children in GBG classrooms and standard program classrooms over the course of elementary school and into middle school, and then into early adulthood. The GBG was tested alone in the first generation in 40 1st grade classrooms in 18 schools. In the second generation, in 27 classrooms in 9 schools, we combined GBG with a curriculum and instruction intervention, since aggressive, disruptive behaviors are highly correlated with poor academic achievement. Currently in the third generation (24 classrooms in 12 schools), GBG is one of three integrated components, each having been tested separately in prior trials. The other components are curriculum and instruction and parent/classroom partnerships around homework and behavior.¹⁵⁻¹⁹

The designs for these three generations of trials have involved the randomization of schools within matched sets in the first generation. In all three generations, children and teachers were randomly assigned to classrooms within schools, and classrooms were randomly assigned to intervention conditions. These designs have required a very strong partnership with the Baltimore City Public School System, working under their aegis, as well as the support of the Baltimore Teachers Union, and our Community and Institutional Board involving leaders of

community organizations and groups.²⁰ Informed written consent was obtained from about 98 percent of parents in each generation of the trials.

The GBG is a method of classroom behavior management directed at the classroom context and administered by the teacher. The GBG is aimed at socializing children into the role of student and reducing aggressive, disruptive behavior. The GBG was selected on the basis of prior published replications.²¹⁻²⁴ In Baltimore, the 1st-grade classroom is divided into three teams, heterogeneous for behavior, with equal numbers of boys and girls. Classroom student rules are posted. The teacher announces when the game is played, and at first it is played for precisely 10 minutes, three times a week. Checks are marked next to the team on a large poster in the front of the room when a child breaks a posted student rule while the game is played. Teachers are trained not to interact punitively during the game but merely to place a mark on the chart when a disturbing behavior occurs. At the end of the week, teams are rewarded for having few check marks that week. At first, rewards are concrete but then become more abstract over the course of the year. The time played each week is gradually expanded from three times a week to the whole day. GBG is “group contingent” and teaches students to influence each other and to support each other in becoming students. The strategy makes each child’s behavior a matter of concern to all children in that team because the team reward depends on each child’s behavior.

These trials in Baltimore indicate that school-based universal interventions (i.e., those addressing all children, not merely those at higher risk) and the GBG in particular, can have short- and long-term beneficial effects on aggressive, disruptive behavior and its developmental outcomes. The GBG resulted in short- and long-term reductions in aggressive, disruptive behavior,^{15,17} off-task behavior,^{25,26} and depressive symptoms.^{12,16,27} Reductions in the initiation of tobacco use have also been shown as a result of GBG in the Baltimore trials.^{28,29} By early adulthood, as-yet-unpublished effects of the GBG have been found among the most aggressive 1st graders (about 15 percent). Young adults who had been in GBG 1st-grade classrooms were compared to those formerly in standard program 1st-grade classrooms. Reductions in the prevalence of antisocial personality disorder were found as well as reductions in illicit drug use. Also worth noting were reductions in the use of school-based services. There is also evidence that children formerly in the GBG attain more years of schooling.

Higher-fidelity implementation of the interventions led to higher impact.^{17,18} Over all three generations of trials of these classroom-based universal interventions, we found the greatest impact on those children at highest levels of early aggressive, disruptive behavior.^{16,30-33} The impact of GBG was limited to boys; no impact on later aggressive behavior was found for girls across all three generations of trials. The level of fidelity of implementing the GBG had a major effect on the impact of GBG. The training of teachers in GBG during the effectiveness trial in the first generation had no lasting endurance in their practice in the next year, when we tested the sustainability of effect by withdrawing the continuing mentoring from a second cohort of 1st graders. Sustaining programs that have been found to be effective appears to require a multilevel ownership and with institutionalizing the continuing mentoring of teachers and ongoing systems for monitoring teacher practices and child outcomes. We are testing such a model now in the third generation of trials in Baltimore.

References

1. Farrington D. The development of offending and antisocial behavior from childhood: Key findings from the Cambridge study of delinquent development. *J Child Psychol Psychiatry*. 1995;36:929–964.
2. Hawkins JD, Catalano RF, Miller JY. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. *Psychol Bull*. 1992;112:64–105.
3. Kellam SG, Brown CH, Rubin BR, Ensminger ME. Paths leading to teenage psychiatric symptoms and substance abuse: Developmental epidemiological studies in Woodlawn. In S. B. Guze, F. J. Earls, & J. E. Barrett (Eds.). *Childhood psychopathology and development*. New York: Raven Press; 1983:17–51.
4. Reid JB, Eddy JM. The prevention of antisocial behavior: Some considerations in the search for effective interventions. In D. M. Stoff, J. Breiling, & J. D. Maser (Eds.). *Handbook of antisocial behavior*. New York: John Wiley and Sons; 1997:343–356.
5. Ensminger ME, Kellam SG, Rubin, BR. School and family origins of delinquency: Comparisons by sex. In K.T. Van Dusen & S.A. Mednick (Eds.), *Prospective studies of crime and delinquency* (pp.). Boston: Kluwer-Nijhoff; 1983:73–97.
6. Ensminger ME., Slusarcick AL. Paths to high school graduation or dropout: A longitudinal study of first grade cohort. *Sociol Educ*. 1992;65:95–113.
7. Robins LN. Sturdy childhood predictors of adult antisocial behavior: Replications from longitudinal studies. *Psychol Med*. 1978;8:611–622.
8. Schwartzman AE, Ledingham JE, Serbin LA. Identification of children at-risk for adult schizophrenia: A longitudinal study. *Int Rev Appl Psychol*. 1985;34:363–380.
9. Shedler J, Block J. Adolescent drug use and psychological health: A longitudinal study. *Annu Prog Child Psychiatry Child Dev*. 1991;545–584.
10. Ary DV, Duncan T., Biglan A, Metzler CW, Noell JW, Smolkowski K. Development of adolescent problem behavior. *J Abnorm Child Psychol*. 1999;27:141–150.
11. Dishion TJ, Capaldi DM, Yoerger K. Middle childhood antecedents to progressions in male adolescent substance use: An ecological analysis of risk and protection. *J Adolesc Res*. 1999;14:175–205.

12. Kellam SG, Ling X, Merisca R, Brown CH, Ialongo N. The effect of the level of aggression in the first grade classroom on the course and malleability of aggressive behavior into middle school. *Dev Psychopathol.* 1998;10:165–185. See also the erratum: Kellam SG, Ling X, Merisca R, Brown CH, Ialongo N. The effect of the level of aggression in the first grade classroom on the course and malleability of aggressive behavior into middle school: Results of a developmental epidemiology-based prevention trial: Erratum. *Dev Psychopathol.* 2000;12:107.
13. Kellam SG, Rebok GW. Building developmental and etiological theory through epidemiologically based preventive intervention trials. In: McCord J, Tremblay RE, eds. *Preventing antisocial behavior: Interventions from birth through adolescence.* New York: Guilford Press; 1992:162–195.
14. Kellam SG, Koretz D, Moscicki EK. Core elements of developmental epidemiologically based prevention research. *Am J Community Psychol.* 1999;27:463–482.
15. Dolan LJ, Kellam SG, Brown CH, Werthamer-Larsson L, Rebok GW, Mayer LS, Laudolff J, Turkkan J, Ford C, Wheeler L. The short-term impact of two classroom-based preventive interventions on aggressive and shy behaviors and poor achievement. *J Appl Dev Psychol.* 1993;14:317–345.
16. Kellam SG, Rebok GW, Mayer LS, Ialongo N, Kalodner CR. Depressive symptoms over first grade and their response to a developmental epidemiologically based preventive trial aimed at improving achievement. *Dev Psychopathol.* 1994;6:463–481.
17. Ialongo NS, Werthamer L, Kellam S, Brown CH, Wang S, Lin Y. Proximal impact of two first-grade preventive interventions on the early risk behaviors for later substance abuse, depression, and antisocial behavior. *Am J Community Psychol.* 1999;27:599–641.
18. Ialongo NS, Poduska JM, Werthamer L, Kellam S. The distal impact of two first-grade preventive interventions on conduct problems and disorder in early adolescence. *J Emotional Behav Disord.* 2001;9:146–160.
19. Reid JB, Eddy JM, Fetrow RA, Stoolmiller M. Description and immediate impacts of a preventive intervention for conduct problems. *Am J Community Psychol.* 1999;27:483–517
20. Kellam SG. Community and institutional partnerships for school violence prevention. *Preventing School Violence: Plenary Papers of the 1999 Conference on Criminal Justice Research and evaluation—Enhancing Policy and Practice Through Research, Volume 2.* NCJ 180972. Washington, DC: National Institute of Justice:2000;1–21.
21. Barrish HH, Saunders M, Wolf MM. Good behavior game: Effects of individual contingencies for group consequences on disruptive behavior in a classroom. *J Appl Behav Anal.* 1969;2:119–124.
22. Fishbein JE, Wasik BH. Effect of the good behavior game on disruptive library behavior. *J Appl Behav Anal.* 1981;14:89–93.

23. Huber H. [English translation] The value of a behavior modification programme, administered in a fourth grade class of a remedial school. *Praxis der Kinderpsychologie und Kinderpsychiatrie*. 1979;28:73–79.
24. Medland MB, Stachnik TJ. Good-behavior game: A replication and systematic analysis. *J Appl Behav Anal*. 1972;5:45–51.
25. Brown CH. Analyzing preventive trials with generalized additive models. *Am J Community Psychol*. 1993a;21:635–664. (Special Issue on Methodological Issues in Prevention Research).
26. Brown CH. Statistical methods for preventive trials in mental health. *Stat Med*. 1993b;12:289–300.
27. Kellam SG, Rebok GW, Ialongo N, Mayer LS. The course and malleability of aggressive behavior from early first grade into middle school: Results of a developmental epidemiologically-based preventive trial. *J Child Psychol Psychiatry*. 1994;35:259–281.
28. Kellam SG, Anthony JC. Targeting early antecedents to prevent tobacco smoking: Findings from an epidemiologically based randomized field trial. *Am J Public Health*. 1998;88:1490–1495.
29. Storr CL, Ialongo NS, Kellam SG, Anthony JC. (2002). A randomized controlled trial of two primary school intervention strategies to prevent early onset tobacco smoking. *Drug Alcohol Depend*. 2002;66:51–60.
30. Brown CH, Liao J. Principles for designing randomized preventive trials in mental health: An emerging developmental epidemiologic perspective. *Am J Community Psychol*. 1999;27(5):673–710.
31. Curran P, Muthèn B. The application of latent curve analysis to testing development theories in intervention research. *Am J Community Psychol*. 1999;27:567–595.
32. Muthèn B, Curran P. General longitudinal modeling of individual differences in experimental designs: A latent variable framework for analysis and power estimation. *Psychol Methods*. 1997;2:371–402.
33. Stoolmiller M, Eddy JM, Reid JB. Detecting and describing preventative intervention effects in a universal school-based randomized trial targeting delinquent and violent behavior. *J Consult Clin Psychol*. 2000;68:296–306.

Linking the Interests of Families and Teachers (LIFT)

John B. Reid, Ph.D.

Rationale

The development of serious antisocial behavior, delinquency, and violence most often begins early, well before school entry, in the context of coercive family interactions between parents and the children, characterized by disruptive child behavior and coercive, inconsistent, and ineffective parental discipline. School entry and the transition to middle school are critical in the development of serious antisocial behavior in childhood, as the aggressive child is at high risk of extending the pattern of antisocial behavior and aggressiveness to transactions with the peer group and with the teacher in the classroom. Early aggression and conflict in these three critical social domains are highly predictive of association with high-risk peers and early onset delinquency during the transition from childhood to adolescence. Early onset delinquency, in turn, is a powerful predictor of chronic and serious delinquent behavior including violence.

What Is LIFT and for Whom Is it Intended?

The LIFT program is a school-based, integrated, and universal intervention that targets aggressive child behavior and coercive interactions in the family, the classroom, and with peers on the playground. The intervention is designed for 1st- and 5th-grade children and their parents. The intervention takes 10 weeks and is usually initiated after the New Year break. The family component consists of six 2-hour parent training and support group sessions, focused on positive encouragement, clear discipline, limit setting, problemsolving, and monitoring and support of academic engagement). The *classroom* component consists of two social skills training sessions per week for 10 weeks. The format is highly interactive, with children organized into cooperative learning groups. The sessions cover classroom rules, compliance and participation, and a series of interpersonal and conflict-resolution skills. The teacher uses a group-level point incentive system (Good Behavior Game) to support positive student behavior. The classroom and parenting sessions are integrated so that similar behavioral issues are targeted simultaneously in both contexts. Social skills training sessions immediately precede recess. On the *playground*, during recess, the Good Behavior Game is continued, with playground monitors systematically encouraging positive interactions among children and taking points for aggressive verbal or physical behavior. Finally, using a dedicated phone line with an answering machine in each classroom, the teacher leaves messages for parents that give advice on encouraging homework, information about specific assignments, and school activities. Parents are systematically encouraged to phone the “LIFT Line” and to leave messages if they wish to communicate with the teacher.

Components of the Study

Outcomes. A randomized trial was carried out to examine the immediate and more distal outcomes of the LIFT intervention.

Sample. Participants in the study were 668 1st- and 5th-grade students (49 percent girls) and their parents. Of the total families, 88 percent agreed to participate, and 89 percent of the sample was European American. More than one-half (54 percent) of the children lived with both biological/adoptive parents, and 20 percent of the families were on public assistance. The study was conducted in 12 schools, with two to four classes in each participating. Class sizes varied from 16 to 27 students.

Design. Elementary schools in the neighborhoods with the highest juvenile crime rates in the Eugene-Springfield metro area were included in a pool for random assignment to the LIFT trial. In each of 3 years, four schools were selected to participate as either a control or an intervention school. A multimethod, multiagent assessment battery, including school and juvenile court records, was used before the intervention began, immediately after, and yearly thereafter.

Intervention Fidelity: Was the LIFT provided as planned? More than 90 percent of items on critical components checklists for each of the three intervention components were endorsed as “completed” by teachers, parent group leaders, and independent observers.

Participation.

- Parent groups: Most (64 percent) of the parents attended at least five of the six sessions; 93 percent of the families received all parent-training materials in some fashion.
- Classroom and playground interventions: On average, children attended 90 percent of the classroom and playground sessions.
- LIFTLINE: Each family made an average of 21 calls to the LIFT Line during the 10-week intervention.

Immediate Outcomes

Both teachers and parents reported high satisfaction with the program; with first grade teachers and parents giving the highest ratings. As predicted, significant, immediate effects for intervention groups were found in all three domains. For teacher ratings of preferred classroom behavior there was a main effect for group. For mother child interaction (observed aversive initiations by mother to child), there was a main effect for group, and a significant interaction with baseline level, with the mothers who were most aversive in lab tasks with their children at baseline showing the greatest intervention effect. For aversive child behavior to peers on the playground there was a main effect for group, as well as a significant group by baseline level effect.

Three-Year Outcomes

Sample retention. Of all families beginning the study, 84 percent participated in the 3-year followup.

Major findings. A central objective of the intervention for the 5th graders was to prevent early involvement with delinquent peers, early initiation of alcohol and drugs, and early arrests. Hazard rates were computed and compared for children in the control and intervention conditions. In terms of odds ratios, youth in the control group were 1.8 times more likely to begin affiliating with peers who get in trouble, 1.49 times more likely to initiate patterned alcohol use, and 1.55 times more likely to be arrested for the first time.

During elementary school, increases in inattentive, impulsive, and hyperactive behavior are important markers for later delinquency. We found that, over the 3-year followup, LIFT 1st graders were significantly less likely to show increases in the severity of these types of behaviors as perceived by teachers. The effect size for this difference was quite large (1.5 within-group standard deviations).

Five-Year Outcomes (in Preparation)

Sample retention. Over 80 percent of all families participated in the 6-year followup.

Major findings. At this time, we have not completed analysis of 6-year arrest data. Other preliminary findings: Control children in the 1st-grade cohort were significantly more likely to be held back at least one grade over the 6-year period; there was a similar, though nonsignificant trend for the 5th-grade cohort. Children in the 1st-grade LIFT intervention were significantly less likely than controls to meet the criteria for a diagnosis of Conduct Disorder. A similar, though nonsignificant trend was found for 5th-grade children in the LIFT intervention (fewer LIFT than control children met criteria for Antisocial Personality Disorder).

Implications and recommendations for future research will be discussed.

References

Eddy JM, Reid JB, Fetrow RA. An elementary-school based prevention program targeting modifiable antecedents of youth delinquency and violence: Linking the Interests of Families and Teachers (LIFT). *J Emotional Behav Disord.* 2000;8:165–176.

Eddy JM, Reid JB, Stoolmiller M, Fetrow RA. Outcomes during middle school for an elementary school-based preventive intervention for conduct problems: Follow-up results from a randomized trial. *Behav Ther.* 2003;34:535–552.

Patterson GR, DeBaryshe BD, Ramsey E. A developmental perspective on antisocial behavior. *Am Psychol.* 1989;44:329–335.

Reid JB. Prevention of conduct disorder before and after school entry: Relating interventions to development findings. *J Dev Psychopathol.* 1993;5:243–262.

Reid JB, Snyder J, Patterson GR, eds. *Antisocial behavior in children and adolescents: A developmental analysis and model for intervention.* Washington, DC: American Psychological Association: 2002;147–172.

Stoolmiller M, Eddy JM, Reid JB. Detecting and describing preventative intervention effects in a universal school-based randomized trial targeting delinquent and violent behavior. *Journal of Consulting and Clinical Psychology.* 2000;68:296–306.

The Incredible Years: Parent, Teacher, and Child Training Series (IYS)

Carolyn Webster-Stratton, Ph.D.

Program Overview

The Incredible Years Series is a set of three comprehensive, multifaceted, and developmentally based curriculums for parents, teachers, and children that dovetail to promote social-emotional competence and to prevent, reduce, and treat behavior and emotion problems in young children.

Program Targets

The programs are designed to treat children, ages 2 to 8, at risk for and/or presenting with conduct problems (defined as high rates of aggression, defiance, oppositional, and impulsive behaviors). They have been evaluated as “selected” prevention programs for promoting the social adjustment of high-risk children in preschool (Head Start and day care) and elementary grades (up to grade 3) and as “indicated” interventions for children exhibiting the early onset of conduct problems.

Program Content

This series of programs addresses multiple risk factors known to be related to the development of Conduct Disorders in children. In all three programs, trained facilitators use videotape scenes to encourage group discussion, problemsolving, and sharing of ideas. The BASIC parent series is “core” and a necessary component of the prevention program delivery. The other parent training, teacher, and child components are strongly recommended with particular populations, depending on their family or child-risk status. For example, it is recommended that children with conduct problems who also have ADHD or who have behavior problems across settings (home and school) receive the child and teacher treatment components in addition to the parent program.

Incredible Years Training for parents. The Incredible Years parenting series includes three programs targeting parents of high-risk children and/or those displaying behavior problems. The BASIC program emphasizes parenting skills known to promote children’s social competence and reduce behavior problems such as: how to play with children, ways to promote children’s cognitive, language, social, and academic skills, effective praise and use of incentives, effective limit-setting, and strategies to handle misbehavior. The ADVANCE program emphasizes parent interpersonal skills such as: effective communication skills, anger and depression management, problem solving between adults, and ways to give and get support. The SUPPORTING YOUR CHILD’S EDUCATION program (known as SCHOOL) emphasizes parenting approaches

designed to promote children's academic skills such as: reading skills, parental involvement in setting up predictable homework routines, and building collaborative relationships with teachers.

Incredible Years Training for teachers. This set of programs emphasizes effective classroom management skills such as: the effective use of teacher attention, praise and encouragement, use of incentives for difficult behavior problems, proactive teaching strategies, how to manage inappropriate classroom behaviors, the importance of building positive relationships with students and their parents. An additional set of programs is designed to show teachers how to implement the Dinosaur Social Skills and Problem Solving Curriculum in the classroom for all children.

Incredible Years Training for children. The Dinosaur Curriculum emphasizes training children in skills such as emotional literacy, empathy or perspective-taking, friendship skills, anger management, interpersonal problem solving, school rules, and how to be successful at school. There is a treatment model of this program for use by therapists with small groups of children exhibiting conduct problems and a prevention model for use by teachers as an ongoing curriculum for all children in the classroom.

Treatment Program Outcomes for Children Diagnosed With Oppositional Defiant Disorder or Conduct Disorder

In a clinic population, six randomized control trials (RCTs) of the parenting series by the developer¹⁻⁷ have indicated significantly more positive parent interactions with children and reduced criticism and harsh discipline. Observations and reports of children's behaviors have also indicated significantly reduced conduct problems and increased cooperation compared with control children. Effect sizes of improvements in children's negative behaviors have ranged from 0.60-1.06. These changes have been shown to have effects lasting up to 3 years later. Moreover, two-thirds of the sample were in the normal range on standardized measures. Three RCT evaluations by independent investigators⁸⁻¹⁰ have replicated these findings in mental health centers in Canada and United Kingdom.

Two RCTs of the small-group child-training series by the developer^{5,11} have indicated significant increases in children's appropriate cognitive problem-solving strategies, prosocial conflict management strategies with peers, social competence, and appropriate play skills, as well as reductions in conduct problems at home and school compared with control children.

One RCT of the teacher-training series by the developer¹¹ indicated significant increases in teacher use of praise, encouragement, and proactive classroom management skills as well as decreases in teacher criticism and harsh discipline. Classroom observations of children indicated significant increases in children's cooperation with teachers, positive interactions with peers, school readiness, and engagement with school activities, as well as reductions in peer aggression. There were also increases in teacher bonding and partnerships with parents.

The studies by the developer cited above have also indicated that adding child training or teacher training to parent training results in significant improvements in peer interactions and

reductions in aggression in the classroom compared with parent training alone. These improvements were more evident at the 1- to 2-year followup assessment.^{5,12} One recently completed RCT study by an independent investigator in Norway has replicated the added benefit of the child-training program.¹³

Prevention Program Outcomes for High-Risk Populations

The parenting programs were adapted for use as prevention programs with socioeconomically disadvantaged, ethnically diverse families. Two RCTs by the developer with high-risk parents of children in Head Start^{7,14} have indicated significant improvements in parenting skills (e.g., replacing spanking with nonviolent discipline approaches) and reduced behavior problems in the high-risk children (those with elevated behavior problems at baseline). Parents with mental health risk factors (e.g., depressive symptoms and substance abuse) showed high attendance and made significant improvements that were shown to be related to reductions in children's externalizing problems.^{15,16} Parents representing Asian, Hispanic, and African American cultures reported high satisfaction with the program and made changes comparable to those made by Caucasian parents.¹⁷ Two RCTs by independent investigators with high-risk populations have replicated the program's results, including one study with African American parents of toddlers enrolled in low-income day care centers in Chicago¹⁸ and another study in Harlem with parents who already have an older child who is incarcerated.¹⁹

One RCT of the teacher-training program with Head Start teachers by the developer⁷ indicated significant increases in teacher use of positive classroom management strategies and increases in children's cooperation with teachers, positive interactions with peers, and school readiness as well as reductions in peer aggression in the high-risk children. Another RCT has replicated this result.²⁰

One RCT of the classroom version of the child-training series is currently nearing completion, and preliminary results are very promising in terms of reductions of classroom aggression and increases in cooperation and social skills. One RCT evaluation by an independent investigator²¹ indicated significant reductions in playground peer aggression.

Future Research

These programs are showing considerable promise in research settings where there is considerable control over selection of group leaders as well as their training, supervision, and monitoring to be sure they are delivering the program with fidelity. Now it is important to study the transportability of these programs to community mental health centers and schools and to study the process of dissemination, including factors that promote fidelity of program delivery and how fidelity is related to effectiveness of outcomes.

References

1. Webster-Stratton C. The long term effects of a videotape modeling parent training program: Comparison of immediate and 1-year followup results. *Behav Ther.* 1982;13:702–714.
2. Webster-Stratton C. Randomized trial of two parent-training programs for families with conduct-disordered children. *J Consult Clin Psychol.* 1984;52(4):666–678.
3. Webster-Stratton C. Long-term follow-up of families with young conduct problem children: From preschool to grade school. *J Clin Child Psychol.* 1990;19(2):144–149.
4. Webster-Stratton C. Advancing videotape parent training: A comparison study. *J Consult Clin Psychol.* 1994;62(3):583–593.
5. Webster-Stratton C, Hammond M. Treating children with early-onset conduct problems: A comparison of child and parent training interventions. *J Consult Clin Psychol.* 1997;65(1):93–109.
6. Webster-Stratton C, Kolpacoff M, Hollinsworth T. Self-administered videotape therapy for families with conduct-problem children: Comparison with two cost-effective treatments and a control group. *J Consult Clin Psychol.* 1988;56(4):558–566.
7. Webster-Stratton C, Reid MJ, Hammond M. Preventing conduct problems, promoting social competence: A parent and teacher training partnership in Head Start. *J Clin Child Psychol.* 2001;30(3):283–302.
8. Scott S, Spender Q, Doolan M, Jacobs B, Aspland H. Multicentre controlled trial of parenting groups for child antisocial behaviour in clinical practice. *Br Med J.* 2001;323(28):1–5.
9. Spaccarelli S, Cotler S, Penman D. Problem-solving skills training as a supplement to behavioral parent training. *Cognit Ther Res.* 1992;16:1–18.
10. Taylor TK, Schmidt F, Pepler D, Hodgins H. A comparison of eclectic treatment with Webster-Stratton's Parents and Children Series in a children's mental health center: A randomized controlled trial. *Behav Ther.* 1998;29:221–240.
11. Webster-Stratton C, Reid MJ, Hammond M. Treating children with early-onset conduct problems: Intervention outcomes for parent, child, and teacher training. *J Clin Child Adolesc Psychol.* 2004;33(1):105–124.
12. Reid MJ, Webster-Stratton C, Hammond M. Follow-up of children who received the Incredible Years Intervention for Oppositional-Defiant Disorder: Maintenance and prediction of 2-year outcome. *Behav Ther.* 2003;34(4):471–491.

13. Mørch WT, Larsson B, Clifford G, Drugli MB, Fossum S. *Treatment of small children with conduct and oppositional defiant disorders*. Unpublished manuscript, University of Tromsø and Norwegian University of Technology and Science, Trondheim, Norway:2004.
14. Webster-Stratton C. Preventing conduct problems in Head Start children: Strengthening parenting competencies. *J Consult Clin Psychol*. 1998;66(5):715–730.
15. Baydar N, Reid MJ, Webster-Stratton C. The role of mental health factors and program engagement in the effectiveness of a preventive parenting program for Head Start mothers. *Child Dev*. 2003;74(5):1433–1453.
16. Reid MJ, Webster-Stratton C, Baydar N. Halting the development of externalizing behaviors in Head Start children: The effects of parenting training. *J Clin Child Adolesc Psychol*. 2004;33(2).
17. Reid MJ, Webster-Stratton C, Beauchaine TP. Parent training in Head Start: A comparison of program response among African American, Asian American, Caucasian, and Hispanic mothers. *Prev Sci*. 2001;2(4):209–227.
18. Gross D, Fogg L, Webster-Stratton C, Garvey CWJ, Grady, J. Parent training with families of toddlers in day care in low-income urban communities. *J Consult Clin Psychol*. 2003;71(2):261–278.
19. Miller Brotman L, Klein RG., Kamboukos D, Brown EJ, Coard S. Preventive intervention for urban, low-income preschoolers at familial risk for conduct problems: A randomized pilot study. *J Child Psychol Psychiatry*. 2003;32(2):246–257.
20. Arnold DH, Ortiz C, Curry JC, Stowe RM, Goldstein NE, Fisher PH, et al. Promoting academic success and preventing disruptive behavior disorders through community partnership. *J Community Psychol*. 1999;27:589–598.
21. Barrera M, Biglan A, Taylor TK, Gunn B, Smolkowski K, Black C, et al. Early elementary school intervention to reduce conduct problems: A randomized trial with Hispanic and non-Hispanic children. *Prev Sci*. 2002;3(2):83–94.

Multidimensional Treatment Foster Care (MTFC)

Patricia Chamberlain, Ph.D.

What is MTFC and for Whom Is it Intended?

Originally developed as a community-based alternative to incarceration for youth with serious and chronic delinquent behavior, the MTFC model has been evaluated as an alternative placement for youth who are court mandated into various types of group homes and residential care facilities. Community families are recruited, screened, trained, and supervised to provide youth with a structured environment that supports their social and emotional development and learning. One youth is placed in each foster family for 6–7 months. MTFC families, youth, and their biological parents (or other aftercare resource) are supported by program services that include a coordinated array of clinical activities. Studies evaluating the effectiveness of MTFC for youth in juvenile justice have included male and female adolescents from 12 to 18 years ($M = 14.9$ and 15.3 , respectively). Males had an average of 14.3 previous criminal offenses (including 4 felonies), and females had 11.9 previous offenses (including 1.7 felonies); 86 percent of the males and 73 percent of the females had committed at least 1 felony offense.

Relationship to Known Risk and Protective Factors

The model was created to target key risk and protective factors identified in empirical and theoretical work on the development of antisocial behavior and delinquency. MTFC addresses *risk factors* that have particular relevance during the developmental period of early adolescence via the following:

- Minimization of the influence of delinquent peers: Therapies and activities that aggregate youth with delinquent peers are avoided.
- Provision of close supervision at home, in school, and in the community: Foster parents are trained to know where their youth is and with whom he or she is associating. This includes knowing the friends of the youth. Youth carry a school card; the teacher signs off each class period on attendance, homework completion, and behavior in class.
- Provision of consistent limits and consequences: Rules and expectations around participation in family life, school, and peer relations are clearly specified. Compliance is encouraged with incentives for normative and positive participation and with sanctions for rule violations and negative behavior. Foster parents use a system of points and levels to operationalize implementation of reinforcement and sanctions.

In terms of *protective factors*, MTFC provides youth with positive mentoring adult role models, places youth in nonrestrictive community settings to build-in generalization of treatment effects, and prepares the biological parents for the youth's return home after MTFC placement.

- Foster parents (who are trained to avoid power struggles and negative interactions) provide daily mentoring and reinforce the positive accomplishments and behavior.
- Youth receive daily encouragement and tangible rewards for meeting/exceeding expectations and receive consequences for infractions.
- To facilitate the return home after care, youth live in families and attend public schools.
- Biological parents participate in family therapy and day-long and weekend home visits to increase their competence at supervision, limit setting, and mentoring.

Program Components

MTFC parents receive 20 hours of training prior to the youth's placement. Once a youth is placed, parents participate in daily telephone calls reporting youth progress and problems during the past 24 hours, weekly supervision and support meetings with seven to nine other foster families, and daily implementation of a behavior management (point/level) system with the youth.

- The youth's biological parents participate in weekly family therapy emphasizing parenting skills, regular contact and home visits with their youth, and aftercare services for up to 1 year.
- The youth participates in daily structure and support in the foster home, skill training in the community, and individual therapy/psychiatry (as needed).
- Staff is on-call 24/7 to all parents. Services are coordinated with juvenile parole/probation.

Boys' outcomes. In 1990–1996, in collaboration with the Oregon Youth Authority, 79 boys were randomly assigned to MTFC or Group Care (GC) settings¹ (NIMH-funded). Results at 1-year followup include the following:

- Compared to GC youth, MTFC boys spent more time in their assigned placements ($\chi^2 1,79 10.96, p = .001$) and less time incarcerated ($p = .02$).
- MTFC boys had larger decreases in criminal offenses than GC youth, $F(1, 77) = 3.93; p < .01$. Of the MTFC youth, 41 percent had *no* referrals in the year following exit from placement; only 7 percent of GC youth had no referrals.
- These effects held in the presence of control variables (e.g., age at first criminal referral, age at baseline, and number of prior criminal referrals). Significant predictors of postplacement offending were group assignment and prereferral rates of offending.

Results at 2-year followup² include the following:

- MTFC boys were significantly less likely to commit violent offenses* than GC boys (5 percent vs. 24 percent had two or more criminal referrals for violent offenses).
- The effect held in the context of control variables (e.g., age at baseline, age of first criminal referral, number of prior criminal referrals).
- Rates of self-reported violent offending were in the normal range for MTFC boys and were four to nine times higher for GC boys.
- MTFC boys were less likely than GC boys to report common violence (e.g., hitting).

What factors predict outcomes? Eddy and Chamberlain (2000) examined the mediation of effects through the level of association with delinquent peers and parenting practices (e.g., monitoring, discipline, and positive youth–adult relationships).³ The analyses showed that the effect of group assignment on subsequent criminal referrals was significantly mediated by the parenting latent construct (supervision, discipline, and positive adult relationships; loadings = .79, .60, and .89, respectively) and by association with deviant peers (loading = .52). The analysis showed that (1) group assignment was significantly associated with the four mediators during treatment ($\beta = .89; p < .05$); (2) group assignment was significantly associated with subsequent youth antisocial behavior ($\beta = .51, p < .05$); (3) the four mediators were significantly associated with youth antisocial behavior ($\beta = -.71, p < .01$); and (4) the impact of group on youth antisocial behavior was not significant in the presence of the mediators ($\beta = .31, ns$). These four variables accounted for 32 percent of the variation in boys' antisocial behavior.

Costs. In a cost–benefit analysis conducted by the Washington State Institute for Public Policy,⁴ the MTFC model was calculated to save taxpayers \$21,836 (taxpayer benefits) to \$87,622 (taxpayer plus crime-victim benefits) per youth.

Girls' outcomes. In 1999, NIMH funded a randomized trial in collaboration with the Oregon Youth Authority that focused on girls; 81 adolescent girls with an average of 12 previous offenses were assigned to MTFC or GC. Results at 1-year followup⁵ include the following:

- MTFC girls had significantly fewer days in locked settings than GC girls, $F(2, 76) = 4.25, p < .05$. MTFC girls spent 62 percent fewer days in locked settings than GC girls.
- Parents reported that MTFC girls were significantly less involved in delinquency, $F(2, 55) = 4.04, p < .05$. MTFC girls had 32 percent less symptom severity.
- MTFC girls showed a trend towards fewer official arrests than GC girls, $F(2, 78) = 2.78, p = .10$. Compared to GC girls, MTFC girls had 42 percent fewer arrests.
- Effects held in the context of control variables (e.g., girls' level of baseline depression and girl's age), suggesting that younger age ($\beta = -.55, p < .01$), less depression ($\beta = -.54, p < .01$), and MTFC ($\beta = -.45, p < .01$) had significant effects on the delinquency composite, with the predictors accounting for 82 percent of the total variance.

* Assaults, menacing, kidnapping, unlawful weapons use, robbery, rape, sexual abuse, attempted murder, and murder.

Studies Using MTFC in the Child Welfare System (CWS). Pilot work in the Oregon CWS⁶ led to an NIMH-funded effectiveness trial currently underway in San Diego County. All children ages 5–12 entering a new foster care placement ($N = 700$) are randomly assigned to one of two conditions: enhanced foster parent training and support (using portions of the MTFC model) or casework services as usual. This study aims to decrease child behavioral and emotional problems, to decrease the rate of placement disruption (i.e., children being moved to other foster homes, residential care, or psychiatric hospitals), to decrease the number of foster parents who drop out of the CWS, and to examine the process of dissemination from the developers in Oregon to interventionists at the Child and Adolescent Services Research Center. Preliminary results show that participation in the enhanced condition is associated with lower externalizing behaviors by the children and fewer placement disruptions.

Conclusion

The feasibility and effectiveness of MTFC relative to more restrictive and costly group care placements have been demonstrated in studies in Oregon. Further research is needed to examine the generalizability of these findings with diverse populations and locales.

References

1. Chamberlain P, Reid, J. Comparison of two community alternatives to incarceration for chronic juvenile offenders. *J Consult Clin Psychol.* 1998;6:624–633.
2. Eddy JM, Whaley R, Chamberlain P. The prevention of violent behavior by serious and chronic juvenile offenders. *J Emotional Behav Disord.* 2004;12(1):2–8.
3. Eddy JM, Chamberlain P. (2000). Family management and deviant peer association as mediators of the impact of treatment condition on youth antisocial behavior. *J Consult Clin Psychol.* 2000;5:857–863.
4. Aos S, Phipps P, Barnoski R, Lieb R. *The comparative costs and benefits of programs to reduce crime: A review of national research findings with implications for Washington State* (No. 99-05-1202). Olympia, WA: Washington State Institute for Public Policy;1999.
5. Leve LD, Chamberlain P., Reid JB. *Intervention outcomes for girls referred from juvenile justice: Effects on delinquency.* Manuscript in preparation; 2004.
6. Chamberlain P, Moreland S, Reid K. (1992). Enhanced services and stipends for foster parents: Effects on retention rates and outcomes for children. *Child Welfare.* 1992;71:387–401.

Multisystemic Therapy (MST)

Scott Walter Henggeler, Ph.D.

Multisystemic therapy (MST) is a family- and community-based treatment that has achieved favorable long-term outcomes (e.g., reduced out-of-home placement, decreased recidivism) and cost savings for youths presenting serious clinical problems (e.g., violence, substance abuse, serious emotional disturbance) and their families. This abstract summarizes the primary outcomes from MST evaluation studies, gives an overview of key features of the MST model, and notes efforts to disseminate the approach.

MST Outcomes

Findings from 10 MST outcome studies (9 randomized clinical trials, 1 quasi-experimental) including almost 1,000 participating families have been published; and of these, 7 studies focused on juvenile offenders presenting serious antisocial behavior. (See Table 1.) The following summary presents the consistent clinical- and service-level outcomes that emerged from these seven studies (studies focusing on youths with serious emotional disturbance and maltreated children are not included). At the clinical level, in comparison with control groups, MST:

- Decreased long-term rates of rearrest by 25 percent to 70 percent.
- Decreased adolescent substance use.
- Improved family relations and functioning.
- Increased school attendance.
- Decreased adolescent psychiatric symptoms.

At the service level and in comparison with control groups, MST achieved:

- High rates (97 percent and 98 percent) of treatment completion in recent studies.
- Decreased long-term rates of days in out-of-home placement by 47 percent to 64 percent.
- Had higher consumer satisfaction.
- Produced considerable cost savings.

Importantly, approximately 15 major MST studies are currently in progress, with the hope that findings will (1) further improve MST outcomes for youths presenting serious antisocial behavior; (2) extend the effectiveness of the model to other serious clinical populations; and (3) inform the effective transport of MST to real-world clinical settings.

Table 1. Findings from Published MST Outcome Studies

Study	Population	Comparison	Followup	MST Outcomes
Henggeler et al. (1986) N = 57 ^a	Delinquents	Diversion services	Posttreatment	Improved family relations, decreased behavior problems, decreased association with deviant peers
Brunk, Henggeler, & Whelan (1987) N = 33	Maltreating families	Behavioral parent training	Posttreatment	Improved parent–child interactions
Borduin, Henggeler, Blaske, & Stein (1990) N = 16	Adolescent sexual offenders	Individual counseling	3 years	Reduced sexual offending, reduced other criminal offending
Henggeler et al. (1991) ^b	Serious juvenile offenders	Individual counseling Usual community services	3 years	Reduced alcohol and marijuana use, decreased drug-related arrests
Henggeler, Melton, & Smith (1992) N = 84	Violent and chronic juvenile offenders	Usual community services; high rates of incarceration	59 weeks	Improved family relations, improved peer relations, decreased recidivism (43%), decreased out-of-home placement (64%)
Henggeler et al. (1993)	Same sample		2.4 years	Decreased recidivism (doubled survival rate)
Borduin et al. (1995) N = 176	Violent and chronic juvenile offenders	Individual counseling	4 years (10-year outcomes forthcoming)	Improved family relations, decreased psychiatric symptomatology, decreased recidivism (69%)
Henggeler, Melton et al. (1997) N = 155	Violent and chronic juvenile offenders	Juvenile probation services, high rates of incarceration	1.7 years	Decreased psychiatric symptomatology, decreased days in out-of-home placement (50%), decreased recidivism (26%, nonsignificant), treatment adherence linked with long-term outcomes
Henggeler, Rowland et al. (1999) N = 116 (Final sample = 156)	Youths presenting psychiatric emergencies	Psychiatric hospitalization	4 months postrecruitment	Decreased externalizing problems (CBCL), improved family relations, increased school attendance, higher consumer satisfaction
Schoenwald et al. (2000)	Same sample		4 months postrecruitment	75% Reduction in days hospitalized, 50% reduction in days in other out-of-home placements
Henggeler et al. (2003)	Same sample		16 months postrecruitment	Favorable short-term outcomes dissipated

Table 1. Findings from Published MST Outcome Studies (continued)

Study	Population	Comparison	Followup	MST Outcomes
Huey et al. (2004)	Same sample		16 months	Decreased attempted suicides
Sheidow et al., (2004)	Medicaid recipients		16 months	Modest short-term cost savings and high cost-effectiveness
Henggeler, Pickrel, & Brondino (1999) N = 118	Substance-abusing and dependent delinquents	Usual community services	1 year	Decreased drug use at posttreatment, decreased days in out-of-home placement (50%), decreased recidivism (26%, nonsignificant), treatment adherence linked with decreased drug use
Schoenwald et. al. (1996)	Same sample		1 year	Incremental cost of MST nearly offset by between-groups differences in out-of-home placement
Brown et al. (1999)	Same sample		6 months	Increased attendance in regular school settings
Henggeler et al. (2002)	Same sample		4 years	Decreased violent crime, increased marijuana abstinence
Ogden & Halliday-Boykins (2004) N = 100	Seriously antisocial adolescents	Child Welfare Services	6 months	Decreased externalizing symptoms, decreased internalizing symptoms, decreased out-of-home placements, increased consumer satisfaction, increased social competence
Rowland et al. (in press) N = 31	Adolescents with serious emotional disturbance	Hawaii's existing continuum of care	6 months	Decreased externalizing symptoms, decreased internalizing symptoms, decreased days in out-of-home placement (68%), decreased recidivism (34%, nonsignificant), increased school attendance

^aQuasi-experimental design (groups matched on demographic characteristics), all other studies are randomized

^bBased on participants in Henggeler et al. (1992) and Borduin et al. (1995)

The Foundation of MST's Clinical Success

Several critical components of MST account for its clinical success. Importantly, these components are logical and research based, but they conflict with the majority of mental health and substance abuse services provided to troubled youths and their families.

- Clinicians provide services in the natural environments of youths and families—in home, school, and neighborhood settings.
- Interventions comprehensively address the known risk factors for serious antisocial behavior—at individual youth, family, peer, school, and neighborhood levels—on an individualized basis.
- Parents and caregivers are treated as central to obtaining desired youth outcomes.
- MST provider organizations are accountable for engaging families in treatment and helping families achieve desired clinical outcomes.
- An intensive and validated quality assurance system supports the capacity of MST treatment teams to achieve desired clinical outcomes.
- MST incorporates empirically based treatments insofar as they exist—including cognitive behavioral approaches, the behavior therapies, behavioral parent training, pragmatic family therapies, and certain pharmacological interventions.

MST Dissemination Efforts

Licensed MST programs are currently operating in more than 30 States and 8 nations, serving approximately 10,000 youths per year. Yet, only about 1 percent of eligible youths—adolescents presenting serious antisocial behavior at high risk of out-of-home placement—receive this evidence-based treatment annually. Nevertheless, statewide MST initiatives are operating in Connecticut, Hawaii, Ohio, South Carolina, and Colorado; nationwide MST initiatives are underway in Norway and Denmark. Program development, training, and quality assurance are provided by MST Services (www.mstservices.com), which has the exclusive license for the transport of MST technology and intellectual property through the Medical University of South Carolina. For States, nations, and organizations that have large MST initiatives, MST Services has helped these entities develop the internal capacity to provide virtually all aspects of MST program development and quality assurance.

There are several studies conducted over the past 10 years that suggest that peer contagion can undermine the effectiveness of programs, or produce negative effects on youth problem behavior:

- **Tracking youth into classrooms in elementary school.** Research reveals that under some conditions, children's assignment to public school classrooms can contribute to their development of aggressive and problem behavior behavior in elementary school.
- **Selected preventive interventions.** Findings from prevention research reveals that under some conditions, creating special groups to develop youth skills can increase problem behaviors. Social skill interventions for girls at risk for delinquency can increase delinquent behavior in comparison to randomized controls. Group interventions with high-risk youth that focus on the development of self-regulation produce benefits in skills, but negative effects on tobacco use and delinquent behavior.
- **Roommate assignment in college.** Randomly assigning roommates in college dorms also provides the opportunity to study peer contagion. It has been known for some time that eating disorders in young women cluster in specific sorority houses. Duncan and colleagues found that randomly assigned male roommates that shared binge drinking histories increased their college drinking compared to those randomly assigned a nondrinking roommate. The peer contagion effects were not noted for females, nor for other forms of substance use such as marijuana.
- **Reduce effect sizes.** A recent meta analysis of intervention programs aimed at reducing delinquent behavior revealed that programs that aggregate youth into groups had systematically lower effect sizes than those that did not aggregate.

Summary and Conclusions

Under some conditions, interventions and programs that aggregate deviant youth may have inadvertent iatrogenic effects. These conditions may include lack of adequate supervision by adult leaders, unsupervised exposure to deviant peer conversation and reinforcement, and opportunities for unsupervised interaction with members of the deviant peer group. The iatrogenic effects seem less likely to occur if the peer group includes at least some socially adaptive peers and involve activities and formal and informal interactions that are well supervised. Surprisingly, there is very little systematic research on the effects of education and juvenile justice programming that involves peer aggregation with respect to its putative benefits and potential harm.

References

- Boxer P, Guerra N, Huesmann R, Morales J. Proximal peer-level effects of small-group selected prevention on aggression in elementary school children: An investigation of the peer contagion hypothesis. *J Abnorm Child Psychol*. In press.
- Crandall CS. Social contagion of binge eating. *J Pers Soc Psychol*. 1988;55:588–598.
- Dishion TJ, Burraston B, et al. Peer group dynamics associated with iatrogenic effects in-group interventions with high-risk young adolescents. In: Erdley C, Nangle DW, eds. *Damon's New Directions in Child Development: The Role of Friendship in Psychological Adjustment*. San Francisco: Jossey-Bass; 2001:79–92.
- Dishion TJ, Spracklen KM, et al. Deviancy training in male adolescent friendships. *Behavior Therapy*. 1996;27:373–390.
- Dishion TJ, Eddy JM, et al. Friendships and violent behavior during adolescence. *Social Development*. 1997;6:207–223.
- Dishion TJ, McCord J, et al. When interventions harm: Peer groups and problem behavior. *Am Psychol*. 1999;54(9):755–764.
- Duncan GJ, Boisjoly J, Kremer M, Levy D, Eccles J. Peer effects in drug use and sex among college students. *J Abnorm Child Psychol*. In press.
- Elliott D, Huizinga D, et al. *Explaining delinquency and drug use*. Beverly Hills, CA: Sage; 1985.
- Gifford-Smith M, Dodge K, Dishion T, McCord J. Peer influence in children and adolescents: Crossing the bridge from developmental to intervention science. *J Abnorm Child Psychol*. In press.
- Kellam S, Ling X, et al. The effect of the level of aggression in the first grade classroom on the course of malleability of aggressive behavior into the middle school. *Dev Psychopathol*. 1998;10(2):165–185.
- Kelly JG. *A guide to conducting prevention research in the community: First steps*. Binghamton, NY: Haworth; 1988.
- Lavallee KL, Bierman KL, Nix R, Conduct Problems Prevention Research Group. The impact of first-grade “friendship group” experiences on child social outcomes in the Fast Track Program. *J Abnorm Child Psychol*. In press.
- Lipsey M. Peer aggregation and treatment efficacy. In K Dodge, J Mc Cord, T Dishion (eds). *Deviant peer contagion: A final report for the Duke Executive Sessions*. In press.

Mager W, Milich R, Harris M, Howard A. Intervention groups for adolescent conduct problems: Is aggregation harmful or helpful? *J Abnorm Child Psychol*. In press.

Palinkas LA, Atkins CJ, Miller C, Ferreira D. (1996). Social skills training for drug prevention in high-risk female adolescents. *Preventive Medicine*. 1996;25:692–701.

Poulin F, Dishion TJ, et al. (2001). 3-year iatrogenic effects associated with aggregating high-risk adolescents in cognitive–behavioral preventive interventions. *Applied Development Science*. 2001;5(4):214–224.

Thornberry TP, Krohn MD. *Taking stock of delinquency: An overview of findings from contemporary longitudinal studies*. New York: Kluwer Academic/Plenum; 2003.

Warren K, Schoppelrey S, Moberg DP, MacDonald M. A model of contagion through competition in the aggressive behaviors of elementary school students. *J Abnorm Child Psychol*. In press.

Costs and Benefits of Different Prevention and Intervention Strategies

Steve Aos, M.S.

Does prevention pay? Can an ounce of prevention avoid (at least) an ounce of cure? More specifically for public policy purposes, is there credible scientific evidence that for each dollar Congress or a legislature spends on “research-based” prevention or early intervention programs for youth, more than a dollar’s worth of benefits will be generated? If so, what are the policy options that offer taxpayers the best return on their dollar?

We examine these questions by conducting an economic analysis of many prevention and intervention programs.¹ There are two basic steps to this study. First, using standard meta-analytic methods,² we quantify the program evaluation research literature that addresses six specific outcomes of interest. We examine whether prevention and early intervention programs have a demonstrated ability to: (1) reduce crime, (2) lower substance abuse, (3) improve educational outcomes such as test scores and graduation rates, (4) decrease teen pregnancy, (5) reduce teen suicide attempts, or (6) lower child abuse or neglect.

To assess whether a program affects any of these outcomes, we require that an evaluation have a well-constructed comparison group. To be included in our study, the comparison group can be randomly assigned or nonexperimentally assigned if credible evidence is presented for group comparability.

For studies that meet these requirements, we then proceed to the second basic step in this study where we estimate the comparative benefits and costs of each research-based program. These measures are our best estimates about the “bottom-line” economics of each approach. To conduct this analysis, we constructed a benefit–cost model to assign monetary values to any observed changes in education, crime, substance abuse, child abuse and neglect, teen pregnancy, and public assistance outcomes.

As was the case in our earlier benefit-cost work,³ we consistently make a number of cautious assumptions. In addition to requiring that evaluations have a scientifically valid research design, we penalize the results from those with a less-than-randomized research approach since there is evidence that studies with weaker research designs tend to show more favorable results.⁴ We also discount findings from evaluations in highly controlled research settings since we have found that real-world programs often produce reduced levels of outcomes.⁵ Additionally, we use a number of other conservative adjustments¹ in an effort to isolate the causal relationships between a prevention program and the monetary valuation of the outcomes of interest. As a result of these cautious assumptions, the benefit–cost ratios we report will usually be smaller than the values from studies undertaken by program developers or advocates. Across all the outcomes and programs we consider, however, we have attempted to be as internally consistent as possible. That is, our bottom-line estimates have been developed so that a benefit–cost ratio for one program can be compared directly to that of another program. By striving for internal

consistency, our benefit–cost estimates are not only our best estimates of the economics of the programs—they can be compared to each other on a relative basis as well.

Findings

Our principal conclusion is that, as of July 2004, some prevention and early intervention programs for youth can give taxpayers a good return on their dollar. That is, there is credible evidence that certain well-implemented programs can achieve significantly more benefits than costs. Taxpayers will be better off if investments are made in these successful research-based programs. This good news, however, must be tempered by our finding that some prevention and early intervention programs fail to generate more benefits than costs. Our research indicates that money spent on these unsuccessful research-based programs is an inefficient use of taxpayer money.

The main policy implications of these findings are straightforward and analogous to any sound investment strategy. To ensure the best possible return for taxpayers:

- Invest in research-proven “blue chip” prevention and early intervention programs. Most of a jurisdiction’s prevention portfolio should be spent on these proven programs.
- Avoid spending money on programs where there is little evidence of program effectiveness. Shift these funds into successful programs.
- Like any business, keep abreast of the latest research-based findings from around the United States to determine where there are opportunities to use taxpayer dollars wisely. The ability to distinguish a successful from an unsuccessful research-based program requires specialized knowledge.

In reviewing the program-specific economic results of this study, several findings emerge: (1) Investments in effective programs for juvenile offenders offer the highest net benefit. Such programs yield from \$1,900 to \$31,200 per youth. (2) Some forms of home visiting programs that target high-risk and/or low-income mothers and children are also effective, returning from \$6,200 to \$17,200 per youth, in excess of program costs. (3) Early childhood education for low income 3- and 4-year-olds and some specific youth development programs provide very attractive returns on investment. (4) While their benefits per youth are lower, many substance use prevention programs for youth are sound investments because the programs are relatively inexpensive. (5) Few well-researched programs appear to be effective at reducing teenage pregnancy. (6) In each program area we examine, we found well-researched interventions that are not cost effective; therefore, carefully selecting the right prevention or early intervention program is an important step in ensuring that taxpayers receive a good return on their dollar.

This research estimates the bottom-line economics for many types of prevention and early intervention programs. It does not consider, however, the full range of prevention programs for

several reasons. First we limit our focus to well-evaluated programs that have affected the six outcomes; there are, of course, many other outcomes of interest for prevention programs. Second, with our current economic methods, we are only able to monetize certain types of measurements of the six outcomes. This restriction means that some well-known and well-researched prevention programs are not included in our economic analysis. Future analytical work can expand the scope of this economic review.

References

1. Aos S, Lieb R, Mayfield J, Miller M, Pennucci, A. Benefits and costs of prevention and early intervention programs for youth. Olympia: Washington State Institute for Public Policy 2004. Available at: <http://www.wsipp.wa.gov/rptfiles/04-07-3901.pdf>
2. Lipsey MW, Wilson DB. *Practical meta-analysis*. Thousand Oaks: Sage Publications; 2001.
3. Aos S, Phipps P, Barnoski R, Lieb R. The comparative costs and benefits of programs to reduce crime. Olympia: Washington State Institute for Public Policy; 2001. Available at: <http://www.wsipp.wa.gov/rptfiles/costbenefit.pdf>
4. Lipsey MW. Those confounded moderators in meta-analysis: Good, bad, and ugly. *Ann Am Acad Pol Soc Sci*. 2003;587(1): 69–81.
5. Barnoski R. Outcome evaluation of Washington State’s research-based programs for juvenile offenders. Olympia: Washington State Institute for Public Policy; 2004. Available at: <http://www.wsipp.wa.gov/rptfiles/04-01-1201.pdf>

Services and Systems of Care

John A. Landsverk, Ph.D.

The delivery of services for children and adolescents who experience or demonstrate violence or other health-risking social behaviors occurs within service systems or sectors, such as mental health, education, child welfare, and juvenile justice. From a service delivery perspective, each of these sectors are organized under different legislative mandates, have different funding streams, and exhibit different cultures and historical development that impact upon delivering preventive or treatment services related to violence. This multisector complexity of service delivery impacts the access to and use of preventive and intervention services and also is likely to impact the implementation of evidence-based interventions.

A conceptualization of the multisector complexity¹ suggests a systematic variation in youth characteristics among the service sectors that may be especially important for the use of interventions that target violence and other health-risking social behaviors. Tables 1 and 2 demonstrate these cross-sector differences in regard to risk status for mental disorder of the child and adolescent population, the type of mental health intervention (e.g., universal, targeted, and clinical), the principal reason for entry into each system, and the sex ratio. For example, the education sector is a primary service sector because services are provided to virtually all children regardless of a specified need for mental health service. Child welfare and juvenile justice are entered for reasons of maltreatment or caretaker absence and legal violations, respectively. These two sectors are characterized with a secondary risk status level and should be considered targeted in regard to the type of mental health intervention. Tertiary risk level and clinical intervention best characterize the mental health sector, including the special education category of severe emotional disturbance. The four sectors have considerable variation in gender profiles with equal gender ratios observed in education and child welfare, but males outnumber females in the juvenile justice and mental health sectors. Furthermore, the graph demonstrates marked variation in average age of entry across the service sectors, with child welfare showing a very low age entry in infancy and toddlerhood and juvenile justice demonstrating an average entry age in adolescence. The different age profiles have strong implications for the type of targeted violence interventions that might be implemented within these service delivery sectors. Finally, considerable evidence suggests the overrepresentation of racial–ethnic minorities in the child welfare and juvenile justice service sectors.²

Risk factors for violence such as rates of mental disorder also can be compared across these service sectors. For example, the San Diego Patterns of Care study^{3,4} examined representative samples of children and adolescents involved in service sectors between the ages of 6 and 17 and found that the four sectors (including SED within special education) had rates of mental disorder in the past year far in excess of the estimated 1 in 5 childhood and adolescent rate in the general population. These rates ranged from a low of 42 percent meeting DSM IV criteria for any disorder in the child welfare population to a high of 70 percent in the school SED population, with juvenile justice and mental health sectors showing rates of 52 percent and 61 percent respectively. The lower rate for child welfare is reflective of the younger age profile for this population. ADHD and disruptive disorders contributed most to the overall rate, with child welfare showing 38.7 percent, juvenile justice 47.9 percent, mental health 65.6 percent, and school SED 65.6 percent.

Table 1. Cross-Sector Differences in Child and Adolescent Systems of Care

Risk Status Level	Mental Health Intervention Type	Sector of Care	Reasons for Entry	Sex Ratio
Primary	Universal	General health	Physical health care	Even
		Education	Education	Even
Secondary	Targeted	Child welfare	Maltreatment/caregiver absence	Even
		Juvenile justice	Legal violations	M > F
Tertiary	Clinical	Substance abuse	Substance abuse	M > F
		SED	Mental health problems	M > F
		Mental health	Mental health problems	M > F

Table 2. Entry Into Child and Adolescent System of Care for Youth With Mental Health Problems

Sector of Care	Infancy/Toddlerhood	Childhood	Adolescence
General health Primary care			
Education			
Child welfare			
Juvenile justice			
Substance abuse			
SED			
Mental health			

= Most common entry age into service sector

*Table and figure are from Garland AF, Hough RL, Landsverk JA, Brown SA. (2001). Multi-sector complexity of systems of care for youth with mental health needs. Children's Services: Social, Policy, Research, and Practice. 2001;4(3):123-40.

Use of preventive and treatment services also varies considerably across these service sectors.⁵ Youth active to mental health and SED within special education exhibited high rates for use of specialty mental health outpatient services, as well as inpatient (22 percent) and residential placement. Youth involved in juvenile justice and child welfare had somewhat lower rates overall, but still showed substantial rates of inpatient mental health care (12 percent and 14 percent respectively).

A fledgling research literature on linkages between these service sectors has emerged. For example, youth in child welfare are at higher risk for entering the juvenile justice system with Jonson-Reid and Barth (unpublished report) reporting that while only 1 percent of children leaving foster care will go to the California Youth Authority, this represents nearly 20 percent of admissions. This finding suggests that early intervention in the child welfare sector may prevent movement into the juvenile justice system.

A major research issue in current services research is the lack of knowledge about factors that impede or encourage successful dissemination and implementation of evidence-based interventions within these service sectors.⁶⁻⁸ Interventions that have shown excellent outcomes effects on risk factors for violence and related health-risking social behaviors in adolescents such as Multi-Systemic Therapy and Treatment Foster Care⁹ are being widely disseminated with some preliminary research examining the factors that may be related to successful implementation within different sectors of care. However, this research area is in its infancy with few findings that can inform how to best move promising interventions from efficacy trials to successful implementation with good outcomes and sustainability in community service delivery systems.

References

1. Garland AF, Hough RL, Landsverk JA, Brown SA. Multi-sector complexity of systems of care for youth with mental health needs. *Children's Services: Social Policy, Research and Practice*. 2001;4(3):123-40.
2. McCabe K, Yeh M, Hough RL, Landsverk J, Hurlburt MA, Culver SW, Reynolds B. Racial/Ethnic representation across five public sectors of care for youth. *J Emotional and Behavioral Disorders*. 1999;7(1):72-82.
3. Garland AF, Hough RL, McCabe KM, Yeh M, Wood PA, Aarons GA. Prevalence of psychiatric disorders in youths across five sectors of care. *J Am Acad Child Adolesc Psychiatry*. 2001;40(4):409-18.
4. Burns BJ, Landsverk J, Kelleher K, Faw L, Hazen AL, Keeler G. In: Loeber R, Farrington DP, eds. *Child delinquents: Development, intervention, and service needs*. 2001:273-304.
5. Hazen AL, Hough RL, Landsverk J, Wood PA. Mental health service utilization by youths in public sectors of care. *Psychiatric Services*. In press.
6. National Advisory Mental Health Council's Clinical Treatment and Services Research Workgroup. *Bridging Science and Service*. National Institute of Mental Health: 1999.

7. Hoagwood K, Burns BJ, Kiser L, Ringheisen H, Schoenwald SK. Evidence-based practice in child and adolescent mental health services. *Psychiatric Services*. 2001;52(9):1179–89.
8. Schoenwald SK, Hoagwood K. Effectiveness, transportability, and dissemination of interventions: What matters when? *Psychiatric Services*. 2001;52(9):1190–7.
9. Schoenwald SK, Henngeler SW, eds. Special Series: Current strategies for moving evidence-based interventions into clinical practice. *Cognitive and Behavioral Science*. 2003;10:275–323.