Making a Difference

An Impact Study of Big Brothers Big Sisters

Joseph P. Tierney
Jean Baldwin Grossman

with Nancy L. Resch

A Publication of Public/Private Ventures

Making a Difference

An Impact Study of Big Brothers Big Sisters

Joseph P. Tierney
Jean Baldwin Grossman

with Nancy L. Resch

Public/Private Ventures is a national nonprofit organization whose mission is to improve the effectiveness of social policies, programs and community initiatives, especially as they affect youth and young adults. In carrying out this mission, P/PV works with philanthropies, the public and business sectors, and nonprofit organizations.

We do our work in four basic ways:

- *We develop or identify social policies, strategies and practices that promote individual economic success and citizenship, and stronger families and communities.*
- *We assess the effectiveness of these promising approaches and distill their critical elements and benchmarks, using rigorous field study and research methods.*
- *We mine evaluation results and implementation experiences for their policy and practice implications, and communicate the findings to public and private decision-makers, and to community leaders.*
- *We create and field test the building blocks—model policies, financing approaches, curricula and training materials, communication strategies and learning processes—that are necessary to implement effective approaches more broadly. We then work with leaders of the various sectors to implement these expansion tools, and to improve their usefulness.*

P/PV's staff is composed of policy leaders in various fields; evaluators and researchers in disciplines ranging from economics to ethnography; and experienced practitioners from the nonprofit, public, business and philanthropic sectors.

Board of Directors

Siobhan Nicolau, Chair
President
Hispanic Policy Development Project

Amalia V. Betanzos
President
Wildcat Service Corporation

Yvonne Chan
Principal
Vaughn Learning Center

John J. DiIulio, Jr.
Fox Leadership Professor of Politics, Religion and Civil Society
University of Pennsylvania

Susan Fuhrman
Dean, Graduate School of Education
University of Pennsylvania

Matthew McGuire
Director of Private Sector Initiatives
Wildcat Service Corporation

Michael P. Morley
Senior Vice President
Eastman Kodak Company

Jeremy Nowak
Chief Executive Officer
The Reinvestment Fund

Marion Pines
Senior Fellow
Institute for Policy Studies
Johns Hopkins University

Isabel Carter Stewart
National Executive Director
Girls Incorporated

Mitchell Sviridoff
Community Development Consultant

Marta Tienda
Professor of Sociology
Princeton University

Gary Walker
President
Public/Private Ventures

William Julius Wilson
Lewis P. and Linda L. Geyser University Professor
Harvard University

Foreword

Over the past decade mentoring has gained enormous respect and support. In one respect that is not surprising: there is nothing so heartwarming, comprehensible and reassuring as an adult befriending and supporting a younger person.

Mentoring also produces important results. In an era when large numbers of Americans have little confidence in social interventions, that mentoring produces hard outcomes for adolescents regarding drug use, violent behavior, school performance and family relationships is at least equal in importance to its intuitive appeal. And mentoring is undiluted social intervention: connecting two strangers of different age groups, supporting and monitoring their relationships through the medium of an organization created for and dedicated to making those relationships work—in the case of this study, Big Brothers Big Sisters of America.

We are re-issuing this 1995 impact study of Big Brothers Big Sisters, in part as a reminder that young lives, even those with serious obstacles, can be profoundly affected by social intervention. The fact that many social interventions for young people have not produced strong results is not a sound basis for giving up on either interventions or adolescents—but is rather a reminder that affecting young lives in an enduring and positive way is very hard work. Like searching for oil or investing in startup companies, there are more failures than successes. Mentoring is like finding a gusher or having invested in America Online at the beginning; we should applaud its success, and use it for all its worth. For mentoring is both a discrete program, and a broader idea: that individual change and progress is fundamentally about having other individuals care, support, tend to and guide on a one-to-one basis. There is no substitute.

The second reason for this re-issue is to remind all of us that this study did not show that mentoring, as a generic idea, is effective. This mentoring was carried out by Big Brothers Big Sisters: a sole purpose federation with almost a century of experience and a distilled-from-experience set of operational guidelines about screening, matching, training, supervising and monitoring. This experience results in mentoring relationships that are intense (weekly, multi-hour meetings) and enduring (over a year in length)—and effective. Mentoring, either as a discrete program or as an idea to inject in schools, afterschool programming or juvenile justice institutions, is neither cost-free nor a knock at professionals. Its easy attractiveness belies the effort and structure that makes it work. Neither warm-hearted volunteers nor well-intended professionals in schools can make it uniformly effective without tending to the lessons that Big Brothers Big Sisters has learned.

Thanks very much to the national BBBSA organization and its current president, Judy Vredenburgh, to the local chapters that agreed to participate in the study, and especially to Tom McKenna, who was president of BBBSA when this study took place. Few leaders of established organizations are voluntarily willing to take the risk of an impact study; his willingness has provided useful information and guidance, and most of all, confidence that our youth with the most obstacles can be helped—now.

Gary Walker
President
Public/Private Ventures
September 2000

Acknowledgments

This study was made possible by funding from Lilly Endowment, Inc., The Commonwealth Fund, The Pew Charitable Trusts and an anonymous donor.

All the members of P/PV's adult/youth relationships research team contributed to this report: Cynthia L. Sipe led the evaluation design and instrument development phases of the project, thus giving it a firm foundation; Nancy L. Resch expertly analyzed the data and drafted the appendices; and Kristine Morrow, Melanie Styles, Alvia Branch, Kathryn Furano, Phoebe Roaf, Danista Hunte and Chris Welser contributed knowledge developed through their work on our other three BBBS studies. Thomas J. Smith and Gary Walker helped to shape the executive summary. Michelle Alberti Gambone, Mark Hughes, Bernardine Watson, Marc Freedman, Jeffrey Greim, Natalie Jaffe and Carol Thomson thoughtfully reviewed the drafts of the report and contributed to its clarity.

Sheena McConnell, Walt Corson and Allen Schirm of Mathematica Policy Research, Inc. assisted with the research design, and their colleagues Joy Gianolio, Cheryl DeSaw and Linda Gentzik managed the mechanics of the random assignment process and directed the interviewing effort.

The project further benefitted from the wisdom of P/PV's Adult/Youth Relationships Advisory Board and Research Advisory Group members. The following advisors provided direction in the study's design, conduct and analyses: Anita Summers of the University of Pennsylvania; Henry Levin of Stanford University; Richard Danzig, an authority on youth service; Beatrix Hamburg of the William T. Grant Foundation; Harold Howe and Heather Weiss of Harvard University; Emmy Werner of the University of California; and Joan Schine of the Early Adolescent Helper program. The following advisors carefully reviewed drafts of the report and contributed to its clarity: Frank Furstenberg of the University of Pennsylvania; Robinson Hollister of Swarthmore College; Frank Levy of MIT; Marta Tienda of the University of Chicago; and Jacqueline Eccles of the University of Michigan. Alan Krueger of Princeton University also reviewed the report.

We also wish to acknowledge the work of P/PV's MIS, support and editorial staffs. Carol Dash expertly prepared the document and patiently worked with the authors; Batia Trietsch and Eleanor Hammond carefully processed the voluminous data; Angela Everman, Greg Weber and Donna Sulak ably handled the programming tasks; and Rhodie Bruce-Holly provided secretarial support. Joseph Zakrzewski offered continuing support and guidance. Michael Callaghan (copy editing), Maxine Sherman (word processing) and Carol Eresian (proofreading) produced the document.

Of course, conduct of the study would not have been possible without the assistance and cooperation we received from Thomas M. McKenna, BBBSA executive director, and Dagmar McGill, BBBSA deputy executive director. We greatly appreciate their participation, and that of the executive directors of the eight agencies who agreed in 1991 to allow us to conduct research at their agencies: David Schirner (Columbus), Frank Ringo (Houston) Linda Anderson, (Minneapolis), Tom Weber (Philadelphia), Linda Searfoss (Phoenix), Elizabeth Callaghan (Rochester), Sharon Baughman (San Antonio) and Nick Mork (Wichita). Special thanks go to the research liaisons at the study agencies who served as the point-of-contact with P/PV: John Hamilton (Columbus), Peggy Turner and Fairan Jones (Houston), Michael Charland (Minneapolis), Cheryl Thomas (Philadelphia), Madeleine Stilwell (Phoenix), John Walker and Lori Vanauken (Rochester), Kathy Blizzard (San Antonio) and Janet Rhodes (Wichita).

Most of all, we would like to thank the case managers who explained the research to the study participants and obtained their consent to participate in this research project. The case managers are: Columbus—Jill Clinger, Jill Gates, Nancy Johnson, Eve Koby, Kelli Mcauley, Michelle Mosher, Cheryl Perkins, Jean Rickly, Amy Rohling, Leta Slavik, Iben Smith and Kerry Welty; Houston—Angela Carruba, Clara Cooper, Jody Hopkins, Angela Koeppeh, Lisa Vaughan and Venetia Wilks; Minneapolis—Jennifer Conlon, Jenny Corniea and Carla Grayes; Philadelphia—Joel Cohen, Dionne Cosby, Lori Deluca, Sylvia Fields, Rebecca Gaspar, Christine Linvill, Erin McConaghy, Cheryl Potter, Douglas Powell, Dawn Siman, Stephen Smith, Terri Tinnin, Debbi Toy and Patricia Wells; Phoenix—Bernadette Alvarado, Teresa Bacon, Sandra Burke, Kevin Davis, Adrian Decker, Frank Delamater, Marcia Duggar, Lenora Forbes, Maryanne Frost, Mark Kimball, Caroline Marquez, Tracy Sallen, Deborah Smith, Tracy Sullivan, Pat Thomas, Susan Wiltfong and Lori Zimmerman; Rochester—Heron Allen, Doris Barr, Marshall Boyler, Mike Connelly and Gina Hurley; Wichita—Kendra Coop, Sue Friend, Diane Hirschfeld, Shari Hocutt and Jennifer Matson; San Antonio—Justine Flores and Kathy Jones.

Finally, we would like to thank both the youth who participated in this project and their parents.

Contents

Executive Summary ii

I. Introduction 2

The Nature of the Problem 2
P/PV's Mentoring Research 2
Organization of the Report 3

II. The Big Brothers Big Sisters Program 4

Operating Standards 4
BBBS and the Mentoring Field 5
Study Agency Selection and Description 7

III. Research Design 8

Hypothesized Impacts 8
Design Strategy 8
Matching Treatment Youth 10
Data Sources 10

IV. The Sample Youth and the Volunteers 12

Background Characteristics of Study Sample Youth 12
The Treatment Youth 16
The Volunteers 16
Length of Matches 16
Summary 19

V. The Impact on Youth of Having a Big Brother or Big Sister 20

Antisocial Behaviors 22
Academic Attitudes, Behavior and Performance 23
Family Relationships 25
Peer Relationships 26
Self-Concept 27
Social and Cultural Enrichment 28
Summary of BBBS Effects on Youth 29

VI. Summary and Conclusions 30

What Produced These Results? 31
Can More Youth Be Served? 31
Areas for Future Research 32
Final Thoughts 33

Endnotes 34

References 36

Appendix A: Study Methods 40

Appendix B: Additional Tables 50

Tables

1. Characteristics of Study Agencies 6
2. Sample Composition 11
3. Race/Gender and Age of Youth by Treatment Status 12
4. Characteristics of the Study Youth's Households and Parents/Guardians 13
5. Stressful Life Experiences of the Youth 14
6. Characteristics of Never-Matched Treatment Youth 15
7. Demographic Characteristics of Volunteers by Gender 17
8. Characteristics of the Matches 18
9. Net Impact of Participation in BBBS on Initiating Use of Drugs and Alcohol 20
10. Net Impact of Participation in BBBS on Hitting, Stealing and Damaging Property 21
11. Net Impact of Participation in BBBS on Academic Outcomes 22
12. Net Impact of Participation in BBBS on Family Relationships Outcomes 24
13. Net Impact of Participation in BBBS on Peer Relationships 26
14. Net Impact of Participation in BBBS on Self-Concept 27
15. Net Impact of Participation in BBBS on Social and Cultural Enrichment Outcomes 28
16. How Youth Benefit from Big Brothers Big Sisters Relative to Similar Non-Program Youth 18 Months After Applying 30

Appendix Tables

A.1. Outcome Measures 41
A.2. Internal Consistency of Scales Used as Outcome Measures, Assessed at Baseline and Follow-Up 43
A.3. Descriptive Statistics of Scales Used as Outcome Measures 44
A.4. Explanatory Variables Used in Regression Models 46
A.5. Selected Baseline Characteristics 47
B.1. Net Impact of Participation in BBBS on Antisocial Activities 50
B.2. Net Impact of Participation in BBBS on Academic Outcomes 52
B.3. Net Impact of Participation in BBBS on Relationship Inequality 53
B.4. Net Impact of Participation in BBBS on Social and Cultural Enrichment Outcomes 54
B.5. Volunteer Screening Procedures by Agency 56
B.6. Match-Related Information by Agency 57

Appendix Endnotes 58

Executive Summary

The past decade has seen widespread enthusiasm for mentoring as a way to address the needs and problems of youth—but no firm evidence that mentoring programs produce results. We now have that evidence.

In this report, Public/Private Ventures (P/PV) provides scientifically reliable evidence that mentoring programs can positively affect young people. This evidence derives from research conducted at local affiliates of Big Brothers Big Sisters of America (BBBSA), the oldest, best-known and, arguably, the most sophisticated mentoring program in the United States. Big Brothers Big Sisters (BBBS) programs currently maintain 75,000 active matches between a volunteer adult and a youngster. Both the programs and matches are governed by carefully established procedures and criteria.

P/PV conducted a comparative study of 959 10- to 16-year-olds who applied to BBBS programs in 1992 and 1993. Half of these youth were randomly assigned to a treatment group, for which BBBS matches were made or attempted; the other half were assigned to BBBS waiting lists. We compared the two groups after 18 months and found that participants in a BBBS program:

- Were less likely to start using drugs and alcohol;
- Were less likely to hit someone;
- Improved school attendance and performance, and attitudes toward completing schoolwork; and
- Improved peer and family relationships.

This report is part of P/PV's eight-year investigation of a range of adult-youth relationship projects. In other reports, we have examined program practices; volunteer recruitment and screening in BBBS programs; and the characteristics of adult-youth relationships in BBBS and other mentoring programs.

An Effective Approach to One-to-One Mentoring

The findings presented in this report reflect the workings of a carefully structured approach to mentoring. Understanding how BBBS programs operate and the standards they adhere to is important, since many other mentoring programs are not as well-structured or carefully managed as the BBBS programs whose matches we studied.

Local BBBS programs are autonomously funded affiliates of BBBSA. In addition to providing ongoing support and representation for its affiliates, the BBBSA national office serves the critical function of promulgating criteria and standards that largely determine the development, maintenance and quality of local matches.

To be formally designated a Big Brothers or Big Sisters program, local agencies must adopt these standards, with minor variations allowed to accommodate local characteristics. The standards govern the screening and acceptance of both youth and adults; the training and orientation volunteers must undergo; the matching process; required meeting frequency; and the ongoing supervision of matches, which involves regular contact between the agency and the adult volunteer, the youth and the parent.

Most local programs operate in more or less the same way: they recruit and carefully screen volunteer applicants for one-to-one matches; they screen youth, who usually come from single-parent households and who must (along with their parents) desire to enter into a match; and they carefully match adult volunteers with youngsters based on backgrounds, on the stated preferences of adult volunteers, parents and youth, and on geographic proximity. On average, the adult-youth pair meets for three to four hours three times per month for at least a year.

In cooperation with the national BBBSA office, P/PV chose eight local, accredited BBBS agencies for this study. We used two criteria in selecting agencies. The first was a large caseload; our aim was to select from the largest BBBS agencies so as to generate adequate numbers of youth for the research sample and to minimize the impact of research activities on agency operations. The second was geographic diversity. The selected sites represent most regions of the United States; they are located in Philadelphia; Rochester, New York; Minneapolis; Columbus, Ohio; Wichita, Kansas; Houston; San Antonio; and Phoenix.

Study Design and Sample Youth

The sample youth were between 10 and 16 years old (with 93% between 10 and 14) when they were found eligible for the BBBS program. Just over 60 percent were boys, and more than half were minority group members (of those, about 70 percent were African American). Almost all lived with one parent (the mother, in most cases), the rest with a guardian or relatives. Many were from low-income households, and a significant number came from households with a prior history of either family violence or substance abuse.

Our research strategy was to compare youth who participated in BBBS programs with those who did not. Thus, we conducted baseline interviews with all youth at the time they were found eligible for the program, then randomly assigned them either to the treatment group, who were immediately eligible to be matched with adult volunteers, or to the control group, who remained on a waiting list for 18 months—a not uncommon waiting period among BBBS applicants.

Both groups were re-interviewed 18 months later. Of the 1,138 youth originally randomized, 959 (84.3%) completed both baseline and follow-up interviews, thus becoming the sample on which findings are based. Of the 487 youth in the treatment group, 378 were matched with a Big Brother or Big Sister, and received the agency support and supervision that would typically be provided. The matched Little Brothers and Little Sisters met with their Big Brother or Big Sister for an average of almost 12 months, with meetings about three times per month lasting about four hours each time.

The aim of the research was to determine whether a one-to-one mentoring experience made a tangible difference in the lives of these young people. We chose six broad areas in which we hypothesized that the mentoring experience might have effects, identified in large part through discussions with local program staff, and a review of the guidelines and other materials produced by the national BBBSA office. The six areas were antisocial activities; academic performance, attitudes and behaviors; relationships with family; relationships with friends; self-concept; and social and cultural enrichment.

All findings reported here are based on self-reported data, obtained from baseline and follow-up interviews or from forms completed by agency staff. Analysis of these data involved multivariate techniques that compared the follow-up survey results for treatment and control youth, controlling for baseline characteristics.[1]

Major Findings

The overall findings are positive. The following are the most noteworthy results:

- Little Brothers and Little Sisters were 46 percent less likely than controls to initiate drug use during the study period. Our results indicate that for every 100 youth in this age group who start to use drugs, only 54 similar youth who have a Big Brother or Big Sister will start using drugs. An even stronger effect was found for minority Little Brothers and Little Sisters, who were 70 percent less likely to initiate drug use than other similar minority youth.[2]
- Little Brothers and Little Sisters were 27 percent less likely than controls to initiate alcohol use during the study period, and minority Little Sisters were only about one-half as likely to initiate alcohol use.
- Little Brothers and Little Sisters were almost one-third less likely than controls to hit someone.
- Little Brothers and Little Sisters skipped half as many days of school as did control youth, felt more competent about doing schoolwork, skipped fewer classes and showed modest gains in their grade point averages. These gains were strongest among Little Sisters, particularly minority Little Sisters.
- The quality of relationships with parents was better for Little Brothers and Little Sisters than for controls at the end of the study period, due primarily to a higher level of trust in the parent. This effect was strongest for white Little Brothers.
- Likewise, there were improvements in Little Brothers' and Little Sisters' relationships with their peers relative to their control counterparts, an effect most strongly evidenced among minority Little Brothers.

We did not find statistically significant improvements in self-concept, nor in the number of social and cultural activities in which Little Brothers and Little Sisters participated.

Conclusions

Our research presents clear and encouraging evidence that caring relationships between adults and youth can be created and supported by programs, and can yield a wide range of tangible benefits.

The most notable results are the deterrent effect on initiation of drug and alcohol use, and the overall positive effects on academic performance that the mentoring experience produced. Improvement in grade point average among Little Brothers and Little Sisters, while small in percentage terms, is still very encouraging, since non-academic interventions are rarely capable of producing effects in grade performance.

These findings, however, do not mean that the benefits of mentoring occur automatically. The research, as noted previously, describes the effects of mentoring in experienced, specialized local programs that adhere to well-developed quality standards. In our judgment, the standards and supports BBBS programs employ are critical in making the relationships work, and thus in generating the strong impacts we have reported. If such standards and supports can be duplicated, the expansion and replication of mentoring initiatives for early adolescents would appear to be a strong and sensible investment, from which at least several million youth could benefit.

Yet this raises two critical issues. First, is there a sufficient number of volunteers who would be willing to make the time and emotional commitment? The indications from prior research are inconclusive.

The second issue is that the support and supervision necessary for mentoring initiatives to produce effective matches cost money—roughly $1,000 per match. It is extremely unlikely that significant expansion could be accomplished entirely with private funds. Public funding also seems unlikely at this time, when budgets for social programs are being drastically cut at the federal level and social policy interventions are widely viewed by the public as ineffective.

However, evidence of effectiveness like that contained in this report—especially around issues of drugs, violence and schooling—may influence the public's view of what can be accomplished, and may also stimulate policymakers to begin shaping a new and more effective social policy approach for youth—one that focuses less on specific problems after they occur, and more on meeting youth's most basic developmental needs.

Introduction

For more than 90 years, the Big Brothers Big Sisters of America (BBBSA) network of agencies has created and supported one-to-one relationships between adult volunteers and youth living in single-parent households. Despite its long existence, however, the effects of this mentoring program on the lives of the youth have yet to be credibly documented. In this report, Public/Private Ventures (P/PV) provides the first scientifically credible evidence that Big Brother Big Sisters (BBBS) programs have many positive and socially important effects on the lives of its young participants.

While this is good news to the mentoring field, the positive impacts presented in this report have implications that extend to youth policy in general. Participation in a BBBS program reduced illegal drug and alcohol use, began to improve academic performance, behavior and attitudes, and improved peer and family relationships. Yet the BBBS approach does not target those aspects of life, nor directly address them. It simply provides a caring, adult friend. Thus, the findings in this report speak to the effectiveness of an approach to youth policy that is very different from the problem-oriented approach that is prevalent in youth programming. This more developmental approach does *not* target specific problems, but rather interacts flexibly with youth in a supportive manner.

The Nature of the Problem

Support and guidance from adults are a critical part of the process that allows youth to grow into responsible adults. Yet today there is a scarcity of such support, especially among poor youth. The institutions we have historically relied on to provide youth with adult support and guidance—families, schools and neighborhoods—have changed in ways that have dramatically reduced their capacity to deliver such support. For example, there are fewer adults in families today: more than one in four children are born into a single-parent home, and half of the current generation of children will live in a single-parent household during some part of their childhood. Cuts in school budgets mean fewer adults per child. And declining neighborhood safety causes both youth and adults to keep more to themselves.

What should society do? Clearly, we cannot abandon adolescents, especially young adolescents. While infants and toddlers are forming fundamental assumptions about human interactions, 10- to 14-year-olds are forming fundamental assumptions about society and their potential role in it. These assumptions are formed through observation of and interactions with adults and the adult world. If caring, concerned adults and role models are available to young people, they will be far more likely to develop into healthy, successful adults themselves (Furstenberg, 1993; Werner and Smith, 1992; Rutter, 1987; Garmezy, 1985). As the Carnegie Council on Adolescent Development's report *Great Transitions* (1995) argues, the years of early adolescence—ages 10 to 14—are society's last best shot at preventing social problems.

With increased recognition of the growing number of adolescents who lack close adult attention, policy interest in mentoring as a form of social intervention has been advocated in such diverse areas as welfare reform, education, violence prevention, school-to-work transition and national service. The dramatic increase in the number of programs attempting to provide adult support for young people, particularly those in poverty, has occurred despite the absence of real evidence that such adult involvement can make a difference. Fittingly, it is a study of BBBS, arguably the bellwether of the mentoring movement, that provides the first such evidence.

P/PV's Mentoring Research

This report is the centerpiece of P/PV's eight-year research initiative to study mentoring. To place the findings in this report in context, we summarize our findings from other studies.

Over the past eight years, P/PV has conducted a series of studies to explore the policy and operational implications of creating adult mentoring relationships for at-risk youth. We have examined the viability and effectiveness of several program models that embody the range of mentoring programs. This focus on existing programs was designed to inform wider, ongoing debate over social policy by tying the discussion to operational realities.

The overarching questions the research initiative has addressed are:

1. Will participation in a mentoring program result in important, observable changes in the attitudes, perceptions and behaviors of at-risk young people?
2. What practices are required to administer mentoring programs effectively? What are the "best practices" regarding how much training, screening, matching and supervision to provide?
3. Is there a set of practices or features that characterize the adults who are effective in their mentoring relationships?

4. Are there large numbers of adults with the time and emotional resources to take on the demands of mentoring at-risk youth?
5. Can mentoring be integrated into large-scale youth-serving institutions, such as juvenile justice agencies?

To provide credible evidence for answering these questions, we undertook several initiatives: an investigation of the Campus Partners in Learning program to study the usefulness of college students as mentors for middle school students at risk of academic failure; an assessment of the I Have A Dream tuition-guarantee and mentoring program at local affiliates in the Washington, D.C. area; an evaluation of the use of older citizens as mentors for at-risk youth in Temple University's national Linking Lifetimes program; a study of mentoring demonstrations operated in Georgia and Missouri by the states' juvenile justice systems; and, as the cornerstone of the research initiative, four studies of the content and effectiveness of the BBBS program.

This report addresses our first research question by showing that participation in BBBS does lead to important, observable changes in the attitudes, perceptions and behaviors of at-risk youth. We speculate that other developmentally oriented mentoring programs that are similarly able to facilitate and carefully oversee long-lasting, intensive matches might have similar success.

Our other studies show that the challenge for mentoring programs lies in strengthening their infrastructures and improving their program practices so that mentors and youth can meet long enough and consistently enough to form meaningful relationships (Tierney and Branch, 1992; Higgins et al., 1991). Although the recent mentoring movement emerged separately from BBBS, there is much that the mentoring field can learn from the practices of this pioneering one-to-one initiative (Furano et al., 1993). These reports begin to answer the question of what type of infrastructure is necessary to facilitate meaningful relationships—the second question in our research agenda.

A program's infrastructure and support are critical in helping the adult and youth overcome the hurdles of forming a relationship and can help when obstacles arise during its course. To a large extent, however, it is the attitudes and actions of the volunteers themselves that lead to the creation of good relationships. Two studies (Morrow and Styles, 1995; Styles and Morrow, 1992) uncovered a set of adult practices that increase the chances that a mentor and youth will form a lasting, more mutually satisfying relationship—the third issue in our agenda.

Three other reports addressed the fourth and fifth questions, concerning the feasibility of expanding and institutionalizing mentoring. In considering whether and how many more youth might be served, we found that more adults would be willing to mentor youth, but that many of these adults are not appropriate to the task (Roaf et al., 1994). Embedding mentoring in existing institutions and programs was found to be very difficult. The obstacles encountered in integrating mentoring into institutions are described by Greim (1992) and Mecartney et al. (1994).

Organization of the Report

Before presenting our findings on how BBBS improves the lives of the Little Brothers and Little Sisters, a number of characteristics about the program and the evaluation are described. Given the uniqueness of BBBS among mentoring programs, Chapter II lays out in detail the infrastructure and standards embedded in the BBBS program model, and describes the practices of the eight agencies that participated in this impact study. Chapter III describes the design of the evaluation.

Chapter IV describes the characteristics of youth who participated in the study. Chapter V then presents the evidence on how youth who participated in a BBBS program differed, 18 months later, from similar youth randomly assigned to a control group. The final chapter summarizes the positive impacts of BBBS on youth, and draws policy implications for and about mentoring programs.

The Big Brothers Big Sisters Program

The BBBS program has paired unrelated adult volunteers with youth from single-parent households for more than 90 years, using an approach that is intensive in delivery and broad in scope. Both the volunteer and the youth make a substantial time commitment, agreeing to meet two to four times per month for at least one year, with a typical meeting lasting four hours. BBBS is not a program targeted at ameliorating specific problems, but at developing the "whole person." The relationship forged with a youth by the Big Brother or Big Sister creates the framework through which the mentor can support and aid the youth as he or she develops, traversing childhood and/or adolescence.

A relationship between an unrelated adult and youth, the hallmark of the BBBS movement, is not established in a vacuum. Behind the hundreds of matches for which each agency is responsible is a professional staff with wide-ranging responsibilities. And undergirding the individual agencies are national operating standards that provide a level of uniformity in recruitment, screening, matching and supervision.

While its standards are reinforced through national training, national and regional conferences, and periodic agency evaluations, BBBS is not monolithic. Individual agencies—including the eight agencies that participated in this study—adhere to national guidelines, but customize their programs to fit the circumstances of the cities and towns in which they are located. This chapter summarizes BBBS operational standards and implementational realities, and provides programmatic details about the eight study agencies.

Operating Standards

Working with over 500 local agencies, the BBBSA national office develops and publishes standards and required procedures to govern screening of volunteers and youth, orientation and training of the volunteer and the youth, and the creation and supervision of matches. These requirements represent minimum acceptable program practices—or the program irreducibles. Agencies can interpret them based on philosophy, geography, budget and the needs of the youth they serve, but these elements must be present.

Volunteer Screening

BBBSA's most stringent guidelines concern procedures for screening volunteers. The purpose of the screening process is to protect the youth by identifying and screening out applicants who pose a safety risk, are unlikely to honor their time commitment or are unlikely to form positive relationships with the youth. (Refer to page 6 for a description of how these procedures are applied in the study agencies.)

The application of the screening procedures is time-consuming and stringent. Earlier research found that after being under consideration for three to nine months, only 35 percent of applicants had been matched; 30 percent either withdrew or were considered by staff to be inappropriate, and 35 percent had not completed all the steps of the process (Roaf et al., 1994).

Youth Screening

The screening process for youth involves a written application, interviews with the parent and child, and a home assessment. Most agencies require that youth have no more than one parent/guardian actively involved in their life, meaning that almost all youth deemed eligible live in single-parent households. Other youth eligibility criteria are age (from a minimum of 5 to a maximum of 18 years old), residence in the agency catchment area, a minimal level of social skills, and the agreement of the parent and child to follow agency rules.

Training

BBBS agencies provide an orientation for volunteers in which the program requirements and rules are explained. Many agencies also offer training on how to recognize and report incidents of sexual abuse. More extensive training is not required, but is recommended by the BBBSA office. Agencies that extend training generally include presentations on the developmental stages of youth, communication and limit-setting skills, tips on relationship-building, and recommendations on the best way to interact with a Little Brother or Little Sister. This information is designed to assist volunteers as they interact with their assigned youth, who are often from different racial or socioeconomic backgrounds.

Matching and Meeting Requirements

BBBSA says little about matching, other than recommending that agencies make matches based on each volunteer's ability to help meet the needs of a specific youth. Yet a study of BBBS program practices found that agencies have developed remarkably similar matching criteria (Furano et al., 1993). In making matches, all the study agencies consider practical factors, such as gender, geographic proximity and availability. In addition, volunteers, youth and parents are asked to state their match

preferences. Volunteers indicate the type of youth they would like to be matched with, noting age, race and the types of activities they expect to engage in with the youth. Youth and their parents state their preference for volunteers, noting such factors as age, race and religion. Youth are asked about their activity preferences.

One aspect of the process that differs across agencies is whether volunteers can choose the youth with whom they will be matched. While some agencies select and present the volunteer with a single youth, others allow the volunteer to choose from several youth. Although the parent/guardian of the youth must approve the selected volunteer, earlier research found that the parent/guardian rarely rejects a proposed volunteer (Furano et al., 1993).

Supervision

In an effort to facilitate effective matches, agencies emphasize supervision. National requirements specify that contact must be made with the parent, youth and volunteer within two weeks of the match. Monthly telephone contact with the volunteer is required during the first year of the match, as is monthly contact with the parent and/or youth. The youth must be contacted directly at least four times during the first year. Once the first year of the match has concluded, the requirement for case-worker contact with the participants is reduced to once per quarter. Case managers also support the match by providing guidance when problems arise in the relationship.

BBBS and the Mentoring Field

BBBS's intensity and extensive infrastructure contrasts sharply with the laissez-faire structure of most of the newer programs. Part of the appeal of the initial wave of mentoring programs implemented during the 1980s was their seeming simplicity: advocates of these programs contended that adults could "naturally" work with youth. Mentors required only time and dedication, not screening, training or supervision. Founders of these programs recalled adults who served as their mentors—coaches, teachers and neighbors—and wanted to re-create that type of support with today's youth. Thus, early recommendations for establishing and maintaining mentoring programs typically touted a laissez-faire approach that appealed to sponsors wary of instituting procedural and structural requirements they felt would intimidate volunteers.

A 1992 report by Marc Freedman warns of the danger of "fervor without infrastructure" in implementing mentoring programs:

> Merely hitching adults to kids, without adequate infrastructure, may create a sense of action, but is likely to accomplish little. It may even backfire. If a relationship engenders hurt or reinforces negative stereotypes, it is worse than no mentoring at all.

P/PV's previous mentoring research clearly points to the importance of volunteer screening and match supervision. We found that youth and mentors in programs with less infrastructure are less likely to meet, and therefore less likely to achieve a necessary condition for affecting the life of a youth: meeting long enough and with enough consistency to establish a relationship.

BBBS matches are among the longest-lasting and most consistent (in terms of meeting) of any mentoring relationships. P/PV's first study of BBBS found that 96 percent of first-year matches had met at least once in the previous four weeks and that, on average, the Big Brothers and Big Sisters had met with their Little Brothers or Little Sisters an average of 3.1 times during that period (Furano et al., 1993).

By comparison, a study of six campus-based mentoring programs that served a population similar to that of BBBS, but had minimal volunteer screening, no criteria for matching and minimal supervision, showed a much lower rate of interaction. Only 57 percent of these matches met on a somewhat regular basis (Tierney and Branch, 1992).

A study of two mentoring programs for youth in the juvenile justice system found that supervision in the two programs was limited, and the rate of interaction between the mentors and youth was correspondingly limited. Mentors in these programs missed more than a third of their scheduled weekly meetings. Among matches with non-incarcerated youth, only 40 percent of scheduled meetings took place (Mecartney et al., 1994).

The only program we examined that came close to the meeting rate of BBBS was an intergenerational mentoring program that paired at-risk youth with elders. Sites for this program had screening, matching and supervision procedures, as well as paid mentors. Pairs met up to six times a month, a high rate that may have reflected the fact that the mentors were paid only if the meeting took place (Styles and Morrow, 1992).

Table 1 Characteristics of Study Agencies

Characteristics	Columbus	Houston	Minneapolis	Rochester	Philadelphia	Phoenix	San Antonio	Wichita
Total Active Matches	754	479	330	358	709	655	277	659
Race/Gender								
Minority Boys	14.5%	22.1%	20.3%	13.7%	34.0%	10.5%	21.7%	18.1%
Minority Girls	22.5	32.2	29.1	20.4	21.6	17.0	31.4	23.4
White Boys	29.6	27.3	20.0	37.1	29.5	38.9	23.8	34.1
White Girls	33.4	18.4	30.6	28.8	14.9	33.6	23.1	24.4
Boys								
Ages 5-9	9.6%	9.8%	3.6%	12.3%	7.7%	6.2%	5.0%	11.7%
10-15	29.3	35.3	32.1	29.0	44.0	40.0	35.5	31.6
16+	5.2	4.4	4.5	9.5	11.8	3.2	5.0	8.9
Girls								
Ages 5-9	15.9%	10.2%	5.5%	9.8%	6.3%	13.9%	13.9%	13.5%
10-15	35.5	37.4	44.9	34.1	23.8	33.3	35.1	28.8
16+	4.5	2.9	9.4	5.3	6.4	3.4	5.5	5.5
Required Meetings Over First Year	3x/Month	2-4x/Month	1/Week	1/Week	1/Week	1/Week	1/Week	1/Week
Required Length of Meeting	2-4 hours	3-4 hours	3-5 hours	3-5 hours	3-4 hours	3-6 hours	3-5 hours	3-4 hours
Matches Lasting 12 Months or Longer	75%	75%	65-75%	70%	80%	n.a.	64%	68%
Cross-Race Matches	25%	33%	39%	47%	30%	22%	34%	n.a.
Agency Budget	$676,000	$998,000	$1,100,000	$505,000	$788,000	$848,000	$323,000	$802,000
Number of Staff	24	26	29	10	23	25	12	31
Full-time case managers	10	13	6	4	11	15	6	8
Part-time case managers	5	1	5	2	0	0	0	13

Note: All data are from 1992.
n.a.= not available.

Study Agency Selection and Description

From the network of more than 500 BBBS local agencies, we selected eight in which to study the effects of the program on youth. Agency participation was sought through presentations of the research agenda at BBBSA's national conference, through an agency survey that requested a detailed profile of participants and program practices, and through in-person interviews with agency staff. The agencies that participated in the study were BBBS of Alamo Area (San Antonio, Texas), BBBS Association of Columbus and Franklin County (Columbus, Ohio), BB&S of Houston, BBBS of Greater Minneapolis, BBBS Association of Philadelphia, Community Partners for Youth (Rochester, New York), BB&S of Sedgewick County (Wichita, Kansas), and Valley BBBS (Phoenix, Arizona).[3]

The following were the key selection criteria for inclusion in the impact study:

- *A large active caseload and waiting list.* So that the research effort would not reduce the number of youth served by the agency nor deny service to youth for substantially longer than would otherwise be the case, and to generate a sufficient number of youth for this study, chosen agencies had to have relatively large caseloads and waiting lists.
- *Geographic Diversity.* The agencies were chosen for geographic diversity. Agencies were in the Northeast (Philadelphia and Rochester), the Midwest (Minneapolis, Columbus and Wichita), the South (Houston and San Antonio) and the Southwest (Phoenix). No agencies on the West Coast met the first two criteria (large waiting list and large active caseload) when sites were selected.

The eight study agencies were among the largest in the BBBS federation, with an average active caseload of 528.[4, 5] The total of 4,221 matches in the eight agencies represented approximately 6 percent of all BBBS matches during 1992. Table 1 shows that the study agencies served similar percentages of boys and girls. Only one agency served less than 40 percent of one gender (36.5% girls), which is explained by the presence of a nearby agency that made only Big Sister matches.

The study agencies had annual budgets ranging from $323,000 to $1.1 million. Since Big Brothers and Big Sisters are unpaid, the majority of the agencies' budget goes toward paying the professional staff who recruit, screen and train volunteers, and make and supervise the matches.

In implementing the volunteer screening procedures, agencies required all applicants to submit a minimum of three written personal references and conducted a background investigation. This background investigation usually involved consulting the police records in the state in which the agency is located and attempting to identify volunteer applicants with a criminal history. Six of the eight study agencies also consulted the files of the state division of motor vehicles, with the intention of excluding volunteer applicants with dangerous driving records (e.g., multiple moving violations).[6] Two of the eight study agencies submitted the volunteer applicants' fingerprints to the FBI to search for past criminal activity. To identify potential child molesters, the agencies either administered a psychological test (half of our study agencies) and/or relied on an extensive in-person psychosocial interview. Five study agencies also visited volunteers' homes to ascertain whether it would offer a safe environment for the Little Brother or Little Sister.

The proportion of minority youth among those matched varied. Three agencies had caseloads that were over 50 percent minority youth; the lowest proportion among the agencies was 27.5 percent. This variability was due to a combination of varying racial composition in the communities and the difficulty some agencies have in recruiting a sufficient number of minority volunteers. Although agencies will match minority youth with white volunteers, many agencies and parents prefer to make same-race matches. The percentage of cross-race matches made by study agencies ranged from 22 percent to 47 percent. Tables with more detailed information about the study agencies can be found in Appendix B.

Research Design

This chapter describes the basic research design. It first discusses the hypothesized impacts of participation in the program, then details the random assignment methodology used to test for the presence of these impacts.

Hypothesized Impacts

The first task was to identify the appropriate impacts to measure in the context of the BBBS program. We developed our list of potential impacts working closely with staff from the BBBSA national office; with the local agencies; and through a review of BBBSA's manual of standards and practices. The national manual lists five "common" goals for a Little Brother or Little Sister: developing a successful relationship; providing social, cultural and recreational enrichment; improving peer relationships; improving self-concept; and improving motivation, attitude and achievement related to schoolwork. In addition, conversations with BBBS staff suggested that having a Big Brother or Big Sister could reduce the incidence of antisocial behaviors, such as drug and alcohol use, and could improve a Little Brother or Little Sister's relationship with the parent.

We thus hypothesized that participation in BBBS would result in some or all of the following impacts:

1. *Reduced Antisocial Activities.* By providing youth with good role models, and helping them cope with peer pressures, think through the consequences of their actions and become involved in socially acceptable activities, volunteers would inhibit youth from initiating alcohol or drug use, and delinquent behavior.
2. *Improved Academic Outcomes*. By showing that they value education, taking an interest in the youth's school progress, and stressing the importance of education to later success, volunteers might influence their Little Brothers' and Little Sisters' attitudes toward school and their school performance. Therefore, we hypothesized that Little Brothers and Little Sisters would value school more, have better attendance and perhaps even get better grades.
3. *Better Relationships with Family and Friends*. The volunteer can help the youth learn how to trust others, express negative feelings more productively, and generally become more able to relate effectively with others. Therefore, we hypothesized that: (1) BBBS participation would have positive effects on the youth's relationship with their custodial parent (usually their mother); and (2) participation in BBBS would have positive effects on the youth's relationships with their peers.
4. *Improved Self-Concept.* A successful relationship might affect how a Little Brother or Little Sister feels about himself or herself. Therefore, we hypothesized that program youth would report a better sense of competence and self-worth than their non-program counterparts.
5. *Social and Cultural Enrichment*. Many of the activities that the volunteer and youth participate in over the course of a match expose the Little Brother or Little Sister to new experiences. Therefore, we hypothesized that Little Brothers and Little Sisters would report taking part in more activities, such as attending sporting events or going to a library, than their non-program counterparts.

Developing a successful relationship, a goal listed in the BBBSA manual of standards and practices, is not included as a hypothesized impact. We view the development of a successful relationship as the core of the program treatment rather than an outcome of participation. Developing a successful relationship is an important mediating factor and earlier research has extensively described how a successful relationship develops.[7] (See Morrow and Styles, 1995.)

Design Strategy

The effect of having a Big Brother or Big Sister on the life of a youth was determined in this evaluation by studying two randomly assigned groups of 10- to 16-year-olds who applied to the study agencies during the intake period.[8] One group of applicants, the randomly selected control group, was put on the waiting list for a Big Brother or Big Sister for 18 months; case managers attempted to match the other randomly selected group—i.e., the treatment group—as quickly as possible. The two groups were then compared at follow-up.

The Reason for Random Assignment

Use of a classical experimental methodology with random assignment to either a treatment or control group was the only way to reach definitive conclusions about the impact of participation in the BBBS program. This random assignment design ensures that the treatment and control groups are statistically equivalent, on average, with respect to all characteristics except program participation. How does random assignment do this? While two randomly chosen individuals are unlikely to be the same age, the average age of two fairly large groups of people randomly selected from the same population is likely to be quite close. In fact, the average of all characteristics of these two large groups is likely to be quite similar. Thus, if the average behavior of the two groups (treatments and controls) differs after the intervention, the difference can be confidently and causally

linked to participation in the program. Hence, the strength of a random assignment design is that the outcomes exhibited by the control group accurately approximate what would have happened to treatment group members if they had not received the intervention.

Some consider random assignment unethical because it denies services to control group youth. While our research design had to include a waiting period for control youth, we addressed such ethical concerns by: (1) ensuring that the *total* number of matches made by an agency did not decline, and (2) using a follow-up period (18 months) that, in many cases, was no longer than an agency's usual waiting period. During the study period, agency staff processed twice the usual number of youth—50 percent of whom were assigned to the treatment group and eligible to be matched with a Big Brother or Big Sister, and 50 percent of whom were assigned to the control group. Before the study began, the average waiting period at the study agencies for boys often exceeded 18 months; the waiting period for girls, while substantially less, still ranged from three to 20 months.

Implementation of Random Assignment

All age-eligible youth who came to the study agencies during the research intake period were required to participate in the intake procedures. There were three exceptions to this requirement:

- *A youth was excluded if he/she could not complete a telephone interview.* Youth fitting this description included those with severe physical or learning disabilities. Families without telephones were included in the research; they called the survey firm's toll-free number from a friend's house or the BBBS agency's office. Across the study agencies, 13 youth were excluded because they could not complete a telephone interview.
- *Youth who were not a part of the BBBS core program were excluded.* Across the study agencies, approximately 50 youth were excluded because they were in a special program, such as the Native American program at Valley Big Brothers Big Sisters in Phoenix. In addition, two agencies ran satellite programs at local colleges. While participants in these programs were official BBBS participants, the program operated under different guidelines; thus, including them in the research would have been analogous to evaluating a college mentoring program rather than BBBS's core program.
- *Youth being served under a contractual obligation were excluded.* Two agencies had agreements with their local child protective services; another agency had an agreement with two youth-serving organizations that the research could not abrogate. Across the study agencies, 61 youth were excluded because they were being served under a contractual obligation.

The random assignment process consisted of three major steps:

1. Through either a personal interview or group presentation, agency staff explained the research project to youth and their parent or guardian, and obtained the consent of both for youth to participate in the research.[9]
2. Agency staff reviewed each application where consent was obtained and determined whether the youth was eligible for the program using their usual procedures.
3. Once a youth was determined to be eligible, P/PV's survey subcontractor randomly assigned him/her to either the treatment or control group.

Although individual agencies tailored processing procedures to fit their own operations, no youth were randomly assigned until agency staff deemed them eligible for the program, and both they and their parents had consented to participation in the research.

In explaining the study to parents and youth, staff pointed out that because youth in the treatment group would receive priority for matching, youth who agreed to participate would have a 50 percent chance of being matched more quickly. Parents also understood that their child had a 50 percent chance of being assigned to the control group, which would mean waiting 18 months before the agency would resume processing their application.

If a parent or youth refused to participate in the research study, the agency placed the youth on the waiting list for 12 months. Only 32 youth and/or parents (2.7%) at these agencies refused to participate in the research. After they determined that a youth was eligible for the program and the parent/guardian and youth signed a consent form indicating that they understood the study, agency staff submitted the name of the youth to P/PV's survey subcontractor for assignment.

Sample Intake

Sample intake ran from October 1991 to February 1993. Agencies were required to implement the random assignment procedures until they reached their sample size goal or until February 1993, whichever came first. Based primarily on the size of their existing caseloads, agencies were assigned varying sample size goals—two agencies had a goal of 230, five a goal of 150 and one a goal of 80. Ultimately 1,138 youth from eight agencies were enrolled in the study over a 17-month period.

Matching Treatment Youth

A major goal of the research design was to minimize the design's interference in the matching process while maximizing the number of treatment youth who were matched. To achieve these potentially conflicting goals, we directed case managers *not* to modify their usual matching criteria, but to prioritize the matching of treatment youth when similar youth were being considered for a specific volunteer. For example, when a case manager determined that a volunteer would work equally well with a 9-year-old girl who was not a part of the evaluation and an 11-year-old treatment group girl from the same area, we instructed the case manager to match the 11-year-old.

Data Sources

Reaching conclusive statements about whether having a Big Brother or Big Sister makes a difference in the life of a young person required information from the youth, parent and case manager at three critical times—at baseline, at the time of the match, and at follow-up. We accomplished this by:

- Administering two surveys to the parent/guardian and the youth (one at the time of random assignment and one 18 months later);
- Asking case managers to complete four data collection forms—two when the study was explained to potential participants, and one each at the time the match was made and 18 months after random assignment;
- Asking a key informant to provide background information about the agency and its program practices.[10]

The centerpieces of data collection were the baseline and follow-up interviews with sample members and their parent/guardian. The baseline interviews occurred immediately after random assignment but before sample members were told whether they were in the treatment or control group. During the baseline interview, the parent was asked to provide general background information, such as his/her years of completed education, welfare receipt by any household members, labor force status and relationship to the youth. The interviewers asked the youth to provide basic demographic information (e.g., age, race/ethnicity, family structure), information on services other than a match that they may have participated in through BBBS, and baseline measures for the outcome variables.

Follow-up interviews were conducted 18 months after random assignment for every sample member who completed a baseline interview. Parents were asked to evaluate the performance of the volunteer, their satisfaction with the BBBS agency and whether they thought the program had made a difference in their child's life, as well as to answer questions about their labor force status and household income. Interviewers asked youth to provide the follow-up measures of the outcome variables, and for the treatment youth, they asked about their relationship with their Big Brother or Big Sister.

Table 2 shows how the sample evolved to the final analysis sample. From October 1991 through February 1993, 1,138 youth were randomly assigned to either the treatment or control group, with 1,107 (97.3%) completing a baseline interview. From April 1993 to September 1994, follow-up interviews were attempted with 1,107 youth; interviewers completed 959. (See Appendix A for a fuller discussion of the interviewing process.) The final response rate of almost 85 percent exceeds acceptable research standards for this type of survey.

For both treatments and controls, case managers were asked to complete two forms when the parent and youth were given the opportunity to participate in the research. The first, the client data form, collected basic information about each youth, and was designed to determine whether the youth was eligible for the study by securing consent for participation, and ascertaining their age and their ability to speak English or Spanish sufficiently well to complete an interview. Information (name, address and telephone number of youth) that allowed the interviewers to administer the baseline survey was also gathered.

The research sample form, the second form completed by case managers, provided detailed background information on the youth and his/her family. This form asked for information about the gender and age of the parent and family structure, and included a series of deeply personal questions about the youth, including whether the case manager believed the young person had been the victim of sexual, physical or emotional abuse, or had any physical or learning disabilities. Also on the form was whether the family had a history of substance abuse or domestic violence, and how the case manager anticipated that the youth would benefit from participation in BBBS.

The match form was completed by the case managers when the Little Brother or Little Sister was assigned to a volunteer. This form served two purposes—it provided information about the volunteers (e.g., age, gender, years of completed education, income, occupation) and allowed us to monitor when matches were taking place.

The final form—the follow-up form—was completed 18 months after random assignment; it provided detailed information about the case manager's perception of the volunteer's performance, a description of problems (if any) that occurred during the match, the reason for terminating the match (if applicable), and several questions about the match itself, including the length and frequency with which the pair met and the goals for the match. For treatment youth who were never matched, the case manager recorded the reason that the agency was unable to make a match.

The final component of the data collection strategy was gathering information that allowed us to describe the agencies themselves, including their individual program practices and information about the type of youth that each served. In 1992, we asked a senior staff member in each site to complete a survey with a wide-ranging series of questions. All eight agencies completed the survey, which provided us with the age, race and gender of all youth served by an agency, their volunteer screening and training procedures, and match supervision guidelines.

Table 2 Sample Composition

	Treatment	Control	Total
Number of Youth Randomly Assigned	571	567	1,138
Number of Youth with Baseline Surveys	554 (97.0%)	553 (97.5%)	1,107 (97.3%)
Number of Youth in the Analysis Sample	487 (85.3%)	472 (83.2%)	959 (84.3%)

The Sample Youth and the Volunteers

This chapter describes the young people in the analysis sample, and the Big Brothers and Big Sisters who were matched with youth in the sample.

Background Characteristics of Study Sample Youth

In this section, we describe the baseline characteristics of the youth in the study sample, and their households. Since no meaningful differences in the baseline characteristics of the treatments and controls emerged—a byproduct of random assignment that was confirmed by statistical analysis (Appendix A)—we do not differentiate between treatments and controls when discussing the background characteristics of the youth, except in Table 3, which presents the age, race and gender of the analysis sample.

The tables contain information for the sample as a whole and for six subgroups: boys, girls, minority boys, minority girls, white boys and white girls. We examine these subgroups partly because the BBBS agencies think of their caseload in these terms. BBBS agencies match only within gender and try to make same-race matches. In this section, we discuss baseline characteristics for the sample as a whole, except when there are large subgroup differences.

Table 3 shows the race/gender and age for the youth in the analysis sample (487 treatments and 472 controls). Just over 60 percent of the sample were boys (62.4%), and over 55 percent were members of a minority group. At about 15 percent, white girls were the smallest subgroup, and at about 34 percent, minority boys were the largest. Seventy-one percent of the minority youth were African American, 18 percent were Hispanic, 5 percent were biracial, 3 percent were Native American and 3 percent were members of a variety of other racial/ethnic groups. Sixty-nine percent of youth came to the program between the ages of 11 and 13.

Table 4 shows that about 90 percent of the youth lived with only one of their parents, and another 5.6 percent lived with only one of their grandparents. Living with a grandparent was slightly more common among minority youth. About 20 percent of these parents/guardians did not graduate from high

Table 3 Race/Gender and Age of Youth by Treatment Status

Characteristics	Treatments	Controls	Overall
Race/Gender			
Minority Girls	21.8%	23.6%	22.7%
White Girls	15.6	14.0	14.9
Minority Boys	33.1	35.1	34.1
White Boys	29.4	27.2	28.3
Age at Baseline			
10	10.1%	10.8%	10.4%
11	24.4	24.4	24.4
12	25.5	22.3	23.9
13	20.1	21.2	20.7
14	13.1	15.0	14.1
15	5.5	5.3	5.4
16	1.2	1.1	1.2
Number of Youth	487	472[a]	959

[a] Three youth did not report their race; thus, the number of youth assigned to the four race/gender groups is 956.

Table 4 Characteristics of the Study Youth's Households and Parents/Guardians

Characteristics	Total	Boys	Girls	Minority Girls	White Girls	Minority Boys	White Boys
Parent/Guardian Relationship to Client							
Parent	90.2%	91.3%	88.2%	84.6%	93.7%	88.6%	94.5%
Foster parent	1.3	1.0	1.7	1.9	1.4	1.2	0.8
Grandparent	5.6	5.0	6.4	8.4	3.5	6.5	3.3
Aunt/Uncle	2.0	2.2	1.7	2.3	0.7	3.4	0.8
Guardian	0.1	0.2	0.0	0.0	0.0	0.0	0.4
Other	0.9	0.3	2.0	2.8	0.7	0.3	0.4
Parent/Guardian Level of Education							
Less than high school graduate	21.6%	18.6%	26.8%	34.0%	16.2%	21.2%	15.5%
High school diploma/GED	36.3	37.0	35.2	32.1	40.1	36.3	37.6
Vocational/Technical	4.6	4.7	4.5	4.3	4.9	5.5	3.7
Some college	25.9	26.6	24.8	24.1	25.4	25.2	28.0
Associate's degree	3.8	3.8	3.7	2.8	4.9	3.1	4.8
College degree or more	7.8	9.4	5.1	2.8	8.5	8.6	10.3
Youth Living in Households Receiving Public Assistance	43.3%	37.1%	53.5%	62.6%	40.1%	45.8%	27.0%
Household Income							
Less than $10,000	39.7%	34.3%	49.0%	60.1%	33.1%	44.6%	21.9%
$10,000 to $24,999	43.0	45.8	38.2	30.1	49.6	39.9	52.8
$25,000 to $39,999	13.1	15.2	9.3	7.9	11.5	13.1	17.8
$40,000 to $54,999	3.3	4.2	1.8	1.5	2.2	2.5	6.3
$55,000 or more	1.0	0.5	1.8	0.5	3.6	0.0	1.1
Number of Youth	959	599	360	217	142	326	271

Note: Three youth did not report their race; thus, the number of youth assigned to the four race/gender groups is 956.

Table 5 Stressful Life Experiences of the Youth

Characteristics	Total	Boys	Girls	Minority Girls	White Girls	Minority Boys	White Boys
Youth Experiencing:							
Death of a parent/guardian	14.6%	15.9%	12.5%	14.3%	9.9%	13.2%	18.8%
Divorce or separation of parent/guardian	39.9	40.0	40.0	29.5	56.3	30.8	50.9
Serious illness/injury of youth or significant other	6.1	9.0	6.1	3.7	9.9	7.7	10.7
Arrest of youth or significant other	7.1	6.0	8.9	10.1	7.0	4.0	8.1
Family history of substance abuse	40.3	41.5	38.3	36.9	40.9	33.2	51.9
Family history of domestic violence	28.3	28.1	28.6	26.3	32.4	23.7	33.7
Significant physical disability	2.9	2.9	3.1	1.4	5.6	2.5	3.3
Significant learning disability	15.6	18.3	11.2	7.9	16.2	14.2	22.9
Significant health problems	9.0	9.8	7.8	7.4	8.5	9.6	10.0
Youth Experiencing Physical, Emotional or Sexual Abuse (reported by case manager):							
Any form of abuse[a]	27.1%	26.3%	28.6%	22.1%	38.7%	19.4%	34.7%
Physical abuse	11.2	11.5	10.6	9.2	12.7	10.5	12.9
Emotional abuse	21.3	21.2	21.4	16.1	29.6	14.2	29.9
Sexual abuse	7.3	4.9	11.4	8.8	15.5	2.8	7.4
Number of Youth	959	599	360	217	142	326	271

Note: Three youth did not report their race; thus, the number of youth assigned to the four race/gender groups is 956.

[a] Some youth had suffered multiple forms of abuse.

Table 6 Characteristics of Never-Matched Treatment Youth

Characteristics	Total	Boys	Girls	Minority Girls	White Girls	Minority Boys	White Boys
Reason Youth Not Matched[a]							
No suitable volunteer found	19.3%	19.1%	20.0%	18.8%	22.2%	13.0%	27.0%
Youth no longer wished to be matched	28.4	26.2	36.0	31.3	44.4	26.1	27.0
Youth no longer suitable for BBBS	10.1	8.3	16.0	18.8	11.1	10.9	5.4
Family structure changed	10.1	10.7	8.0	6.3	11.1	10.9	10.8
Youth moved out of area	10.1	7.1	20.0	12.5	33.3	4.4	10.8
Total Number of Never-Matched Youth	109 (22.4%)	84 (27.5%)	25 (13.7%)	16 (15.1%)	9 (11.8%)	46 (28.6%)	37 (25.9%)

Note: One boy did not report race.
[a] Case manager could check multiple items.

school, and over 35 percent had completed only high school or earned a GED. About 25 percent of the parents/guardians had some college experience.

Many of the youth lived in poor households—over 40 percent were receiving either food stamps and/or cash public assistance. Minority girls were the most likely to live in homes collecting welfare (62.6%), while white boys were the least likely (27.0%). Minority boys and white girls were about equally likely to live in homes receiving public assistance.

As shown in Table 5, a significant number of study sample youth had experienced difficult personal situations, such as the divorce or separation of their parents, a family history of substance abuse or domestic violence, or being the victims of physical, emotional and/or sexual abuse.

Approximately half of the white youth and one-third of the minority youth had experienced the divorce or separation of their parents/guardians. Fifteen percent of the youth had experienced the death of a parent/guardian. Over 25 percent of the youth lived in homes with a history of domestic violence and 40 percent resided in homes with a history of substance abuse; both these experiences were more characteristic of white than of minority youth's households.

More than one-quarter of the youth had experienced either physical, emotional or sexual abuse. White youth were more likely than were minority youth to have experienced some form of abuse. The most prevalent form of abuse was emotional abuse, experienced by approximately 30 percent of the white youth and 15 percent of the minority youth. White girls were the most likely to be victims of sexual abuse (15.5%).

The Treatment Youth

The only difference between the treatment and control group youth was that the treatment youth had the opportunity to be matched with a Big Brother or Big Sister.[11] This section discusses how matches were made in the context of the evaluation, how long it took to match the treatment youth, how long they were matched, and why some treatment youth were not matched during the study period.

Selecting an appropriate volunteer to match with a youth is perhaps the most important program practice. Agency staff decisions to pair an adult volunteer with a specific Little Brother or Little Sister are affected by a variety of factors—among them, shared interests, reasonable geographic proximity, preferences for same-race matches, and a desire to match youth who have been waiting the longest.

At the conclusion of the study period, 378 (78%) of the treatment youth in the analysis sample had been matched. About 90 percent of the girls and 75 percent of the boys had been matched. This gender differential is consistent with the typical experience of BBBS agencies, which have historically had difficulty recruiting sufficient male volunteers to meet the demand for Big Brothers.

As shown in Table 6, agency staff reported three major reasons for the failure to match 109 treatment youth during the study period:

- Thirty-three of the unmatched treatment youth became ineligible for BBBS matches during the study period. These changes in status, which occurred after random assignment but before a match could be made, were due to such events as the parent remarrying, or the youth getting too old or changing place of residence.
- Thirty-one were not matched because the youth did not want or no longer wanted a Big Brother or Big Sister. Agency staff reported that some parents will request a Big Brother or Big Sister for a child who does not want one. If a case manager determines that this is the case, he/she will not make a match.
- Twenty-one were not matched because a suitable volunteer could not be found during the study period. Agency staff will not make a match solely for the sake of making a match. Even though staff were prioritizing the matching of treatment youth, they would rather not make a match than make a bad one.
- The 24 remaining treatment youth were not matched for a variety of reasons, most often because the parent or youth did not follow through with the intake process.

The Volunteers

During the study period, 409 Big Brothers and Big Sisters were paired with treatment youth.[12] The average age of the 236 men who were matched with Little Brothers in the study sample was 30; the average age of the 173 women was 28.

As shown in Table 7, the Big Brothers and Big Sisters were generally well-educated young professionals. Only 13 percent had a high school education or less, and more than 60 percent had a college or graduate degree. Nearly half worked in professional or managerial positions, another one-quarter held technical, sales or administrative jobs, and about 10 percent were students. Only one-third lived in households with less than $25,000 in income, and almost 30 percent lived in homes with incomes of $40,000 and over. About three-quarters were white, which resulted in approximately 60 percent of the minority youth being matched with a white Big Brother or Big Sister.

BBBS agencies will match a Big Brother or Big Sister with a second Little Brother or Little Sister when their first previous match ends, provided that the reason the match ended was not due to the volunteer's inability to engage in a successful match. Among the volunteers matched with Little Brothers or Little Sisters in the study sample, over 10 percent had previously served as a Big Brother or Big Sister.

Length of Matches

How long a treatment youth had been meeting with the Big Brother or Big Sister at the conclusion of the study period depended on how long it took the agency to find an appropriate volunteer and how long the match itself lasted. Table 8 shows that on average, agencies needed six months to match minority boys, five months to match white boys, almost four months for minority girls, and three and a half months for white girls. At the time of the follow-up interview, the average length of match for treatments who had been matched was almost 12 months, with white girls having met with a Big Sister for the longest period (12.3 months) and minority boys having met with a Big Brother for the shortest (10.7 months).

Little Brothers and Little Sisters met with their Big Brothers and Big Sisters on a regular basis. Over 70 percent of the youth met with their Big Brother or Big Sister at least three times a month, and approximately 45 percent met one or more times per week. At the time of the follow-up interview, 229 of the 378 matched treatment youth were still meeting with their Big Brother or Big Sister, while 149 treatment youth were no longer matched.

Table 7 Demographic Characteristics of Volunteers by Gender

	Big Brothers	Big Sisters
Age		
16-19	1.7%	1.2%
20-24	22.8	38.0
25-29	37.8	31.6
30-34	16.3	13.5
35-39	6.9	6.4
40 +	14.6	9.4
Race		
White	71.9%	75.4%
Minority	28.1	24.6
Have Own Children	19.0%	13.7%
Household Income		
< $10,000	4.6%	5.1%
$10,000 - 24,999	18.4	42.4
$25,000 - 39,999	40.1	34.8
$40,000 - 54,999	19.8	12.0
$55,000 +	17.0	5.7
Completed Years of Education		
High School Diploma or Equivalent	11.1%	14.6%
Some College	24.4	29.8
College Graduate	50.4	43.3
Graduate Education	14.1	12.3
Occupation		
Unemployed	0.4%	0.0%
Student	8.3	13.7
Retired	0.4	0.6
Managerial/Professional	51.7	44.6
Technical/Sales/Administrative	23.5	30.4
Service	10.0	7.7
Other	5.6	3.0
Previously Served as Big Brother or Big Sister	13.2%	11.1%
Number of Volunteers	236	173

Note: 19 men and 14 women did not answer the household income question. On the remaining questions, each group had less than 10 missing responses per item.

Table 8 Characteristics of the Matches

Characteristics	Total	Boys	Girls	Minority Girls	White Girls	Minority Boys	White Boys
Time to Match and Length of Match by Gender and Race							
Average time to match (months)	4.7	5.4	3.6	3.9	3.4	5.9	4.9
Average total exposure[a] (months)	11.4	10.9	12.0	11.8	12.3	10.7	11.2
How Often Little Brother or Little Sister Met With Big Brother or Big Sister							
Two times per week	4.5%	5.8%	2.6%	2.2%	3.1%	4.2%	7.6%
Once a week	41.7	41.2	42.6	39.6	46.9	35.8	47.2
Three times per month	24.4	22.6	27.1	29.7	23.4	27.5	17.0
Two times per month	24.2	25.2	22.6	24.2	20.3	24.2	26.4
Once per month	5.3	5.3	5.2	4.4	6.3	8.3	1.9
Number of Matched Youth	378	221	157	90	67	115	106

[a] Combined length of all matches, including closed first matches and those still meeting at time of follow-up interview. The figure is based only on the ever-matched sample.

Summary

This chapter highlighted several key data:

- Of the 959 youth in the sample, almost 60 percent were minority youth and over 60 percent were boys. Many were poor, with 40 percent living in homes receiving public assistance. A substantial number had experienced disruptive personal circumstances: 40 percent lived in families with a history of substance abuse, 28 percent in families with a history of domestic violence, and 27 percent were themselves the victims of emotional, physical or sexual abuse.
- Over 400 volunteers were matched with study sample youth. These Big Brothers and Big Sisters were generally well-educated young professionals. About 60 percent were college graduates, while only 13 percent had earned just a high school degree or GED. About two-thirds lived in homes where the total income of all household members was greater than $25,000, with about 40 percent living in homes with over $40,000 in income. About 50 percent held managerial or professional positions, and 25 percent held technical, sales or administrative jobs.
- Of the 487 youth in the treatment group, 378 (78%) were matched with a Big Brother or Big Sister during the study period; on average, youth were matched with a Big Brother or Big Sister for 12 months during that period. About 70 percent of the matches met three or four times a month, with an average meeting lasting four hours.

The following chapter presents findings on whether participation in a BBBS program made a difference in the lives of Little Brothers and Little Sisters.

The Impact on Youth of Having a Big Brother or Big Sister

Mentoring programs that pair adults with young people have been hypothesized to have multiple benefits for the youth. In this chapter, we present evidence concerning the benefits of participation in the BBBS program. We measured program impacts 18 months after a youth was deemed eligible to participate in a BBBS program, with the expectation that this period would give agency staff sufficient time to find a suitable volunteer for the youth and give the match sufficient time to develop and begin to affect the youth.

The 959 youth in the study sample (487 treatments and 472 controls) came to the program when they were, on average, 12 years old. Almost 60 percent were members of a minority group, and over 60 percent were boys. The vast majority (over 80%) came from relatively poor households. Almost 80 percent of the treatment youth were matched with a Big Brother or Big Sister during the study period; on average, the relationships had lasted almost one year at the conclusion of the study period (i.e., the time of the follow-up survey).

Identifying an appropriate set of outcomes to determine whether participation in a BBBS program makes a difference in the life of a youth is a complex task, particularly since BBBS is an individualized program with different goals for each match. As discussed in Chapter III, we selected the following set of outcome areas:

- Antisocial Activities;
- Academic Performance, Attitudes and Behaviors;
- Relationships with Family;
- Relationships with Friends;
- Self-Concept; and
- Social and Cultural Enrichment.

Although improvements in each of these areas are not explicit goals for every match, they are the objectives most frequently cited by BBBS staff. The program might have had effects on other outcomes that we did not measure.

Table 9 Net Impact of Participation in BBBS on Initiating Use of Drugs and Alcohol

	Change in the Likelihood of Initiating Drug Abuse		Change in the Likelihood of Initiating Alcohol Use	
	Net Impact	Follow-up Control Mean	Net Impact	Follow-up Control Mean
Overall	-45.8%**	11.47%	-27.4%*	26.72%
Gender				
Male	-55.0%**	11.54%	-19.2%	26.48%
Female	-26.6	11.36	-38.8	27.08
Race/Gender				
Minority Male	-67.8%**	13.41%	-11.4%	21.60%
Minority Female	-72.6*	11.50	-53.7*	26.97
White Male	-32.7	9.09	-34.5	33.33
White Female	49.5	11.29	-8.4	27.78

Note: The size of the analysis sample was 959: 217 minority girls, 142 white girls, 326 minority boys, 271 white boys, and 3 youth who did not give their race.
** Indicates that the impact differs statistically from zero at the 0.05 level.
* Indicates that the impact differs statistically from zero at the 0.10 level.

Table 10 Net Impact of Participation in BBBS on Hitting, Stealing and Damaging Property

	Number of Times Hit Someone		Number of Times Stole Something		Number of Times Damaged Property	
	Net Impact	Follow-up Control Mean	Net Impact	Follow-up Control Mean	Net Impact	Follow-up Control Mean
Overall	-.85**	2.68	-.05	.26	-.03	.20
Gender						
Male	-.67	2.67	-.07	.27	-.04	.24
Female	-1.17*	2.69	-.02	.24	-.03	.13
Race/Gender						
Minority Male	-.09	2.13	.01	.24	.02	.30
Minority Female	-1.45	3.04	-.07	.27	-.02	.13
White Male	-1.54*	3.39	-.16	.30	-.10	.16
White Female	-.37	1.85	.06	.20	-.05	.14

Note: The size of the analysis sample was 959: 217 minority girls, 142 white girls, 326 minority boys, 271 white boys, and 3 youth who did not give their race.
** Indicates that the impact differs statistically from zero at the 0.05 level.
* Indicates that the impact differs statistically from zero at the 0.10 level.

In the following sections, we discuss impacts in each of these six outcome groups. We considered between four and 10 outcomes for each group. Outcome variables were classified as either attitudinal or behavioral. The attitudinal outcomes were typically scales measured by a series of items or questions combined to form a single measure. The behavioral outcomes were typically based on the responses to single questions—e.g., How often were you sent to the principal's office? How many hours per week do you spend doing homework?[14] All outcome variables we considered are listed in Appendix A, which also includes the reliability analysis for the attitudinal scales.

The impact estimates presented here represent a comparison of the average experience of treatment group members with the average experience of control group members.[15] Overall impact estimates were calculated by comparing all treatments to all controls. A negative net impact indicates that the treatment value is lower than the control value; a positive net impact indicates that the treatment value is higher than the control value. Subgroup impacts compare the treatment youth in that subgroup with the control youth in the same subgroup. The experience of the control group represents what would have happened to the treatment group had they not been given the opportunity to participate in the BBBS program.

Any differences that develop between the two groups can be confidently attributed to a youth's participation in the BBBS program.[16] For ease of presentation, we refer to the treatment group as "Little Brothers and Little Sisters," even though this group includes some treatment youth who were never matched. We highlight only impacts that are statistically significant at a .10 level of confidence.

Antisocial Behaviors

We hypothesized that the relationships youth experience in BBBS would lead them to exhibit fewer antisocial behaviors, as suggested by Furstenberg (1993) and Werner and Smith (1992). The two most important antisocial behaviors we considered were the initiation of drug and alcohol use. Elliot (1993) presents evidence that delaying the onset of the use of illegal drugs and alcohol decreases the likelihood that the youth will engage in problem behaviors, such as criminal activity and school failure. Some might argue that it is less important to delay the onset of alcohol use, since most teens experiment with alcohol at some point. However, Elliot reports that among youth who never use alcohol, the risk of serious delinquency is reduced by a factor of four. Thus, delaying alcohol use should decrease the likelihood of delinquency.

As shown in Table 9, we found that Little Brothers and Little Sisters were significantly less likely than their control counterparts to start using illegal drugs and alcohol during the study period. Little Brothers and Little Sisters were 45.8 percent less likely to start using illegal drugs than were their control counterparts. The impact was largest among minority Little Brothers and minority Little Sisters, both of whom were approximately 70 percent less likely than their control counterparts to have started using illegal drugs. Put differently, for every 100 minority boys in this age group who start using illegal drugs, only 33 similar minority boys who have a Big Brother will start using illegal drugs. For every 100 minority girls in this age group who start using illegal drugs, only 28 similar girls who have a Big Sister will start using illegal drugs.[17]

The results for initiating alcohol use were not as large as those for initiating drug use, but were still impressive: Little Brothers and Little Sisters were 27.4 percent less likely than control

Table 11 Net Impact of Participation in BBBS on Academic Outcomes

	Perceived Ability to Complete Schoolwork (Scholastic Competence)		Grade Point Average (GPA)		Number of Times Skipped Class		Number of Times Skipped a Day of School	
	Net Impact	Follow-up Control Mean	Net Impact	Follow-up Control Mean	Net Impact	Follow-up Control Mean	Net Impact	Follow-up Control Mean
Overall	.71***	16.36	.08*	2.63	-.51**	1.39	-.47***	.90
Gender					##		###	
Male	.39	16.64	.03	2.60	-.18	1.05	-.02	.57
Female	1.25***	15.89	.17**	2.67	-1.07***	1.95	-1.22***	1.45
Race/Gender							###	
Minority Male	-.11	17.11	.06	2.58	-.27	1.25	.22	0.51
Minority Female	1.52***	15.67	.20*	2.62	-.92**	2.01	-.98***	1.26
White Male	1.06**	16.05	.01	2.63	-.10	0.81	-.31	0.66
White Female	.81	16.27	.10	2.74	-1.36**	1.88	-1.66***	1.80

Note: The size of the analysis sample was 959: 217 minority girls, 142 white girls, 326 minority boys, 271 white boys, and 3 youth who did not give their race.
*** Indicates that the impact differs statistically from zero at the 0.01 level.
** Indicates that the impact differs statistically from zero at the 0.05 level.
* Indicates that the impact differs statistically from zero at the 0.10 level.
Indicates that the impact was not the same across subgroups at a 0.01 level of significance.
Indicates that the impact was not the same across subgroups at a 0.05 level of significance.

youth to start using alcohol. The impact was greatest among the minority Little Sisters, who were less than half as likely to start drinking alcohol. Put differently, for every 100 minority girls in this age group who start to use alcohol, only 46 similar girls who have a Big Sister will start using alcohol.

We looked at a number of other indicators of antisocial behavior. Table 10 shows the most important of these: how often the youth hit someone, stole or damaged property over the past year. While we did not find any impacts on the number of times a youth stole or damaged property, Little Brothers and Little Sisters were 32 percent less likely to report hitting someone during the previous 12 months.[18] We also looked at the number of times youth were sent to the principal's office, did "risky" things, fought, cheated on a test or used tobacco. There were no significant overall impacts on these outcomes. (See Appendix B.)

Academic Attitudes, Behavior and Performance

As Table 11 shows, we found that Little Brothers and Little Sisters earned higher grades, skipped fewer classes and fewer days of school, and felt more competent about doing their schoolwork than did control youth. The impacts were larger for girls.

We were not optimistic that having a Big Brother or Big Sister would improve a Little Brother or Little Sister's grades during the study period, since other research has shown that grades are fairly stable over time and are generally not affected by non-instructional interventions like BBBS. However, given the importance of school performance to later success and a desire to identify programs that do improve school performance, we collected data on academic performance by asking the study sample youth what types of grades they typically received, ranging from mostly Ds and Fs to mostly As.[19, 20]

	Weekly Hours of Homework		Weekly Hours Spent Reading		School Value Scale	
	Net Impact	Follow-up Control Mean	Net Impact	Follow-up Control Mean	Net Impact	Follow-up Control Mean
Overall	.27	4.80	.01	2.46	.69	55.27
Gender						
Male	.41	4.73	.12	2.05	1.02*	54.29
Female	.04	4.91	-.18	3.12	.14	56.89
Race/Gender						
Minority Male	.66	4.54	-.51	2.21	.85	55.22
Minority Female	-.28	4.74	-.20	2.22	-.56	57.74
White Male	.15	4.98	.94*	1.86	1.27	53.05
White Female	.48	5.25	-.26	4.68	1.27	55.48

At the conclusion of the study period, Little Brothers and Little Sisters reported 3 percent better grades than did control youth. Little Brothers and Little Sisters reported, on average, a grade point average (GPA) of 2.71, while controls reported a GPA of 2.63. The grades of Little Sisters, especially minority Little Sisters, appeared to be the most responsive to participation in the program. The average GPA for girls in the control group was 2.67; for Little Sisters it was 2.83. The difference was even greater for minority Little Sisters, who had an average GPA of 2.83 compared with 2.62 for minority girl controls. Thus, we can infer that being involved with BBBS begins to improve the youth's school performance.

We also found that BBBS improved the youth's school attendance. Little Brothers and Little Sisters were significantly less likely to skip classes or a day of school. At the end of the study period, Little Brothers and Little Sisters had skipped 52 percent fewer days and 37 percent fewer classes.

As with the other academic outcomes, the impact was larger for girls. On average, Little Sisters skipped 84 percent fewer days of school than did control girls. Minority Little Sisters skipped 78 percent fewer days than their control counterparts, and white Little Sisters skipped 90 percent fewer days than their control counterparts. Results were similar for skipping classes.

Research also shows that youth who feel more competent in school tend to be more engaged and perform better. Therefore, we examined changes in Harter's scale of perceived scholastic competence (1985) to determine whether participating in the program increased a student's expectations for school success.

Table 12 Net Impact of Participation in BBBS on Family Relationships Outcomes

	Summary Parental Relationship Measure		Trust		Communication	
	Net Impact	Follow-up Control Mean	Net Impact	Follow-up Control Mean	Net Impact	Follow-up Control Mean
Overall	1.5**	70.65	.64**	23.79	.53	27.76
Gender						
Male	1.83*	71.53	.67**	24.22	.67	28.08
Female	.99	69.21	.60	23.08	.30	27.23
Race/Gender			#			
Minority Male	.43	72.25	-.05	24.64	-.02	28.44
Minority Female	.63	70.39	.39	23.54	.35	27.67
White Male	3.54**	70.52	1.55***	23.68	1.55**	27.62
White Female	1.35	67.45	.82	22.43	.20	26.55

Note: The size of the analysis sample was 959: 217 minority girls, 142 white girls, 326 minority boys, 271 white boys, and 3 youth who did not give their race.
*** Indicates that the impact differs statistically from zero at the 0.01 level.
** Indicates that the impact differs statistically from zero at the 0.05 level.
* Indicates that the impact differs statistically from zero at the 0.10 level.
# Indicates that the impact was not the same across subgroups at a 0.10 level of significance.

At the conclusion of the study period, we found that treatment youth felt more confident of their ability to complete their schoolwork than did control youth. The effect was particularly strong for the Little Sisters, especially minority Little Sisters, whose perceived scholastic competence score was 10 percent higher than that of the minority girls in the control group. The program also increased the perceived scholastic competence of white Little Brothers by 7 percent.

We also considered other school-related outcomes, such as hours each week spent reading and doing homework, the number of times that a youth visited a college and went to a library, and the number of books read. We found no overall statistically significant differences among the treatment and the control group members on these outcomes. (These findings are detailed in Appendix B.)

Family Relationships

As shown in Table 12, we found that the quality of a youth's relationship with his or her custodial parent increased following program participation, especially among white Little Brothers. We hypothesized that having one successful relationship would carry over to a youth's other relationships by helping them to trust others, express anger more productively, and generally become better able to relate to others effectively.

To examine youth's relationships with their custodial parent, we used the Relationship with Mother scale of the Inventory of Parent and Peer Attachment (IPPA) (Armsden and Greenberg, 1987). Since 86 percent of the parents/guardians were mothers, we were primarily measuring the relationship between study sample youth and their mother.[21] The IPPA measures three components of the parent-child relationship—trust, communication, and anger and alienation.

	Anger and Alienation		Number of Times Lied to Parent	
	Net Impact	Follow-up Control Mean	Net Impact	Follow-up Control Mean
Overall	.33	21.82	-1.36**	3.72
Gender				
Male	.48	21.98	-.83	3.63
Female	.06	21.56	-2.24	3.89
Race/Gender				
Minority Male	.33	21.96	-.53	3.37
Minority Female	-.02	21.88	2.11*	3.52
White Male	.68	21.95	-1.23	3.97
White Female	.14	21.11	-2.51	4.55

Using the summary measure of the parent-child relationship, we found that Little Brothers and Little Sisters scored higher than control youth. The effect was strongest among Little Brothers, especially white Little Brothers, whose scores were 5 percent higher than those of white boys in the control group. In examining the components of this scale, we found that the overall effect was driven primarily by an increase in Little Brothers' and Little Sisters' trust in their parents. Again, the impact was greatest among white Little Brothers, who scored 7 percent higher than their control counterparts. For the sample as a whole, the sub-scales measuring communication and anger and alienation were not affected by participation in the program. However, white Little Brothers felt that they communicated better with their parent or guardian than their control counterparts.

We also examined the number of times youth said that they lied to their parent. At the conclusion of the study period, Little Brothers and Little Sisters reported lying to their parent 37 percent less than control group youth.

Peer Relationships

To examine youth's relationships with their peers, we used five scales from the Berndt and Perry (1986) Features of Children's Friendship Battery—Intimacy in Communication, Instrumental Support, Emotional Support, Conflict, and Relationship Inequality.

Table 13 shows outcomes for four of these scales. (Relationship Inequality, for which no significant impacts emerged, is shown in

Table 13 Net Impact of Participation in BBBS on Peer Relationships

	Intimacy in Communication		Instrumental Support		Emotional Support		Conflict	
	Net Impact	Follow-up Control Mean	Net Impact	Follow-up Control Mean	Net Impact	Follow-up Control Mean	Net Impact	Follow-up Control Mean
Overall	.21	11.18	-.09	12.98	.29*	12.51	-.20	11.61
Gender								
Male	.41	10.63	.03	12.70	.41*	12.11	-.15	11.55
Female	-.13	12.10	-.27	13.43	.09	13.17	-.29	11.69
Race/Gender	#							
Minority Male	.58*	10.31	.31	12.35	.72**	11.84	-.31	11.49
Minority Female	-.75*	11.98	-.51	13.30	-.28	13.18	-.24	11.45
White Male	.19	11.07	-.29	13.16	.02	12.47	.08	11.61
White Female	.83	12.24	.02	13.70	.64	13.14	-.45	12.15

Note: The size of the analysis sample was 959: 217 minority girls, 142 white girls, 326 minority boys, 271 white boys, and 3 youth who did not give their race.
** Indicates that the impact differs statistically from zero at the 0.05 level.
* Indicates that the impact differs statistically from zero at the 0.10 level.
# Indicates that the impact was not the same across subgroups at a 0.10 level of significance.

Appendix Table B.3.) We found that Emotional Support was higher among Little Brothers and Little Sisters than among the controls; this was especially true for minority Little Brothers, among whom such support increased 6 percent.

When we examined impacts within subgroups, we found that minority Little Brothers scored somewhat higher than control counterparts on Intimacy in Communication, while minority Little Sisters scored somewhat lower. While we do not have evidence of why minority Little Sisters scored lower on this scale, we hypothesize that minority Little Sisters might be sharing their problems with their Big Sisters rather than with peers. There were no significant impacts for the other peer relationships scales.

Self-Concept

Supportive relationships with adults have been linked with adolescents' self-concept (Haensly and Parsons, 1993; Scales, 1991; Tietjen, 1989; Hirsch and Reischl, 1985). As shown in Table 14, our findings on self-concept involved attitudinal variables measuring self-worth, social acceptance and self-confidence.

Overall, by the time of the follow-up interview, Little Brothers and Little Sisters did not score significantly higher than youth in the control group on the scales measuring global self-worth, social acceptance or self-confidence. There was, however, a significant impact for white Little Brothers. They scored significantly higher on the social acceptance scale, which taps the respondents' perceived popularity among their peers.

Table 14 Net Impact of Participation in BBBS on Self-Concept

	Global Self-Worth		Social Acceptance		Self-Confidence	
	Net Impact	Follow-up Control Mean	Net Impact	Follow-up Control Mean	Net Impact	Follow-up Control Mean
Overall	.29	18.57	.37	18.19	.18	28.44
Gender						
Male	.24	19.12	.54	18.23	.01	28.70
Female	.37	17.67	.09	18.12	.46	28.02
Race/Gender						
Minority Male	.23	19.13	.34	18.68	-.27	29.01
Minority Female	.42	17.79	-.03	18.45	.22	28.00
White Male	.31	19.09	.85*	17.66	.43	28.33
White Female	.32	17.52	.10	17.65	.68	28.08

Note: The size of the analysis sample was 959: 217 minority girls, 142 white girls, 326 minority boys, 271 white boys, and 3 youth who did not give their race.
* Indicates that the impact differs statistically from zero at the 0.10 level.

Social and Cultural Enrichment

We found no overall differences between the Little Brothers and Little Sisters and the control youth in the frequency of participation in social and cultural enrichment activities, such as going to museums, or attending plays and sporting events. This was surprising, since many Little Brothers and Little Sisters, parents and agency staff cited opportunities to experience social and cultural events as a primary attraction of the BBBS program. To examine these outcomes, we asked sample youth how many times they engaged in particular activities and how many hours they spent doing these activities during a typical school week. The specific social and cultural activities about which we gathered data were: taking part in organized sports or recreation programs outside school hours; doing volunteer or community service; taking music, art, language or dance lessons outside of school; participating in school clubs; participating in youth groups; going to sporting events; attending plays or performances; going to a museum; and doing outdoor activities, such as hiking.

Table 15 presents two summary measures of these activities, the total weekly hours spent in social and cultural activities and total attendance at these activities. We found no significant difference between the treatment and control youth in either the hours spent per week engaged in social and cultural activities, or the total number of events attended.

The only differences we found were that Little Brothers and Little Sisters reported participating in fewer outdoor activities (particularly white Little Brothers) and Little Brothers (especially minority Little Brothers) reported attending more sporting events than did their control counterparts. The net impacts for each specific activity are presented in Appendix B.

Table 15 Net Impact of Participation in BBBS on Social and Cultural Enrichment Outcomes

	Total Weekly Hours Spent in Social and Cultural Activities		Total Attended Social and Cultural Events	
	Net Impact	Follow-up Control Mean	Net Impact	Follow-up Control Mean
Overall	.25	5.03	-.32	6.54
Gender				
Male	-.22	5.46	-.42	7.14
Female	1.04*	4.33	-.17	5.57
Race/Gender				
Minority Male	.27	5.39	.61	5.53
Minority Female	.76	4.85	-.59	4.69
White Male	-.77	5.58	-1.87**	9.26
White Female	1.39	3.52	.48	7.00

Note: The size of the analysis sample was 959: 217 minority girls, 142 white girls, 326 minority boys, 271 white boys, and 3 youth who did not give their race.
** Indicates that the impact differs statistically from zero at the 0.05 level.
* Indicates that the impact differs statistically from zero at the 0.10 level.

Summary of BBBS Effects on Youth

Taken together, the results presented here show that having a Big Brother or Big Sister offers tangible benefits for youth. At the conclusion of the 18-month study period, we found that Little Brothers and Little Sisters were less likely to have started using drugs or alcohol, felt more competent about doing schoolwork, attended school more, got better grades, and had better relationships with their parents and peers than they would have had they not participated in the program.

To reiterate the major findings:

- Substantially fewer Little Brothers and Little Sisters had started using illegal drugs at the end of the study period than had control youth. Our results indicate that for every 100 youth in this age group who start to use drugs, only 54 similar youth who have a Big Brother or Big Sister will start using drugs. The impact was greater among minority youth. For every 100 minority boys in this age group who start using drugs, only 33 similar youth who have a Big Brother will start using drugs. For every 100 minority girls in this age group who start using drugs, only 28 similar youth who have a Big Sister will start using drugs.
- Fewer Little Brothers and Little Sisters had started using alcohol at the end of the study period than had control youth. For every 100 youth in this age group who start to use alcohol, only 73 similar youth who have a Big Brother or Big Sister will start using alcohol. The impact was greater among minority girls. For every 100 minority girls in this age group who start to use alcohol, only 46 similar youth who have a Big Sister will start using alcohol.
- Little Brothers' and Little Sisters' academic behavior, attitudes and performance were better than those of the control group. Little Brothers and Little Sisters skipped half as many days of school as control youth; felt more optimistic about doing their school work well; and had a slightly higher GPA than the control youth (2.71 versus 2.63). The effects on the minority Little Sisters were the strongest; relative to their control counterparts, minority Little Sisters were 10 percent more optimistic about their academic competence, skipped 78 percent fewer days and had a higher GPA (2.83 versus 2.62).
- The quality of the Little Brothers' and Little Sisters' relationships with their parents or guardians was better at the end of the study period than it was for control youth. The increase was due primarily to a higher level of trust in the parent among the Little Brothers and Little Sisters than among controls. The impact was strongest for white boys, whose levels of both trust and communication increased due to participating in the program.
- The quality of the Little Brothers' and Little Sisters' relationships with their peers was better at the end of the study period than it was for control youth. Specifically, Little Brothers and Little Sisters—especially minority Little Brothers—felt more emotional support from their peers than did control youth.
- There were no overall impacts on Little Brothers' and Little Sisters' feelings of self-worth, self-confidence or social acceptance at the conclusion of the study period.
- Finally, there were no systematic differences in participation in social and cultural activity among Little Brothers and Little Sisters relative to the control youth.

In addition to the program's beneficial effects on all youth in the sample, there are some areas in which the subgroup impacts exceed those on the overall sample:

- Minority Little Sisters were substantially less likely than minority girls in the control group to start using illegal drugs or alcohol. They also had significantly higher grades, felt more confident of their ability to do their school work, skipped fewer days of school and classes, and lied to their parents less often.
- Minority Little Brothers were substantially less likely than minority boys in the control group to start using illegal drugs. They also felt more emotional support from and greater intimacy in communication with their peers.
- White Little Sisters skipped school substantially less often than white girls in the control group.
- White Little Brothers hit others less often, felt more confident about completing their school work, and had better relationships with their parents or guardians than white boys in the control group.

Summary and Conclusions

The rise in the number of single-parent households, the deterioration of neighborhood ties in many communities and the increased demands of work have left many youth isolated from adults. Approximately 25 percent of all youth and over 50 percent of minority youth currently live in homes with only one parent, usually their mother. Few young people are able to supplement familial support with non-familial support. Research shows that it is uncommon for a youth to have even one significant close relationship with an unrelated adult (Steinberg, 1991).

For over 90 years, BBBS has been addressing the needs of youth in single-parent households by providing caring, consistent adult support in the form of a Big Brother or Big Sister. Today, it provides about 75,000 young people with one-to-one supports. Yet BBBS agencies serve only a fraction of the number of youth who could benefit from their services: approximately 17 million youth now live in single-parent homes (U.S. Bureau of the Census, 1994, p.66). The lucky youth who do get a Big Brother or Big Sister do benefit. The Little Brothers and Little Sisters in this study, primarily aged 10 to 15, fared better than similar youth in the control group in numerous ways, as summarized in Table 16. The most dramatic findings were the degree to which participation in BBBS programs helps young people avoid initiating drug and alcohol use. Little Brothers and Little Sisters were 46 percent less likely to start using illegal drugs, and 27 percent less likely to start drinking.

Program participation also began to improve a youth's school behavior and performance. Little Brothers and Little Sisters attended school more often than their non-program counterparts. They were 52 percent less likely to skip a day of school and 37 percent less likely to skip a class. They earned slightly higher grades (3% higher), and felt slightly better about how they would perform in school (4% better). While the improvements in these education outcomes were modest when compared to the reductions in the use of illegal drugs and alcohol, the fact that we observed improvements in education attitudes, performance and behavior strongly suggests that having a Big Brother or Big Sister was beginning to have a positive effect in the academic area.

Having a relationship with their Big Brother or Big Sister improved the youth's other relationships: Little Brothers' and Little Sisters' parental (or guardian) relationships were better than control youth's. They trusted their parents more and lied to them less. Improving the youth's relationships with their parents and guardians is critical given that they are almost exclusively from single-parent homes. Should this relationship deteriorate, these youth would be at risk of becoming significantly more isolated from adult support.

Table 16 How Youth Benefit from Big Brothers Big Sisters Relative to Similar Non-Program Youth 18 Months After Applying

Outcome	Change
Antisocial Activities	
Initiating Drug Use	-45.8%
Initiating Alcohol Use	-27.4
Number of Times Hit Someone	-31.7
Academic Outcomes	
Grades	3.0%
Scholastic Competence	4.3
Skipped Class	-36.7
Skipped Day of School	-52.2
Family Relationships	
Summary Measure of Quality of the Parental Relationship	2.1%
Trust in the Parent	2.7
Lying to the Parent	-36.6
Peer Relationships	
Emotional Support	2.3%
Number of Youth	959

Note: All impacts in this table are statistically significant at at least a 90 percent level of confidence.

With their peers, Little Brothers and Little Sisters felt more emotionally supported—i.e., more backed up by their friends and less criticized. There are many dimensions to the relationships that early adolescents have with their peers. While we observed an improvement in only the level of emotional support, this improvement may lead over time to improvements in other areas of an adolescent's peer relationships.

What Produced These Results?

Little Brothers and Little Sisters fared better than youth in the control group as a result of their participation in the BBBS program, which consisted of one-to-one interaction with an adult volunteer (the Big Brother or Big Sister) supported by a professional casework staff that followed a detailed sequence of operational standards designed to promote a positive match. This report does not provide evidence that any type of mentoring will work, but that mentoring programs that facilitate the specific types of relationships observed in the BBBS program work. In our judgment, the positive impacts observed are unlikely to have occurred without both the relationship with the mentor and the support the program provided the match.

The One-to-One Interaction

This study did not characterize the type of relationship that formed between the volunteer and the youth, nor did it relate the type of relationship to the size of the impacts we observed. We hope to pursue such issues later, but they were beyond the scope of this study. However, we do know the following about the relationships between the treatment youth and their Big Brothers and Big Sisters:

- They had a high level of contact. A typical Big Brother or Big Sister met with a Little Brother or Little Sister approximately three times a month for four hours per meeting over the course of a year, totalling 144 hours of direct contact. For those who spoke on the telephone, as many did, hours of interaction would be even higher.
- The relationships were built using an approach that defines the mentor as a friend, not as a teacher or preacher. The mentor's role is to support the youth in his or her various endeavors, not explicitly to change the youth's behavior or character.

BBBS is a program oriented to developing a young person. That participation in BBBS was able to achieve transformative goals while taking a general developmental approach lends strong support to the emerging consensus that youth programs are most effective in achieving their goals when they take a more supportive, holistic approach to youth (Gambone, 1993; Pittman, 1992; Grossman and Halpern-Felsher, 1992).

The Program Infrastructure

All available evidence (including our other mentoring studies) persuades us that the following program irreducibles are prerequisites for an effective mentoring program:

- Thorough volunteer screening that weeds out adults who are unlikely to keep their time commitment or might pose a safety risk to the youth;
- Mentor training that includes communication and limit-setting skills, tips on relationship-building and recommendations on the best way to interact with a young person;
- Matching procedures that take into account the preferences of the youth, their family and the volunteer, and that use a professional case manager to analyze which volunteer would work best with which youth; and
- Intensive supervision and support of each match by a case manager who has frequent contact with the parent/guardian, volunteer and youth, and provides assistance when requested or as difficulties arise.

Can More Youth Be Served?

The surprisingly robust findings from this research suggest the advisability of expanding programs that create long-lasting, meaningful relationships. However, several additional issues require serious consideration.

First, how many additional volunteers would be willing to make the time and emotional commitment required of a Big Brother or Big Sister? Earlier research (Roaf et al., 1994) suggests that more volunteers could be screened and matched if the agencies could hire more case managers. Local agencies reported that they delayed processing a large number of volunteers not because staff were uncertain about their suitability to be Big Brothers or Big Sisters, but because the agency did not have sufficient staff to screen, match and supervise additional matches. That report also quoted agency executive directors who said the problem was not volunteer recruitment but raising additional funds to support the additional matches.

The second—and likely most problematic—issue is identifying sufficient financial resources to support program expansion. This evaluation did not include a cost study, so we cannot precisely document the annual cost of supporting an additional match. Based on the annual budgets of the eight study agencies and their staffing patterns, however, $1,000 seems a reasonable

estimate of the cost of making and supporting each additional match. Accordingly, we estimate a cost of $1 million to serve each additional 1,000 youth. Raising such a sum is beyond the capacity of most local agencies, which get most of their money from a combination of private fundraising activities (such as auctions and bowling tournaments) and the United Way, with smaller amounts donated by private foundations and corporations. According to BBBSA staff, federal, state and local governments currently contribute inconsequential amounts.

How many youth could BBBS agencies serve if the necessary funds were available? How many appropriate volunteers could be recruited? How many youth would participate? Our research suggests that the answers to these questions are worth pursuing.

Areas for Future Research

This study provides critical evidence to the mentoring field by showing that participation in the BBBS program has an important impact on the lives of the young people matched with a Big Brother or Big Sister. However, some questions about how these positive impacts were achieved remain unanswered.

Earlier research looked at how a relationship forms in the context of the BBBS program (Morrow and Styles, 1995). The report's major finding was that the relationships sorted themselves into two broad categories, labeled prescriptive and developmental. While most volunteers in developmental matches ultimately hoped to help youth improve in school and be more responsible, they focused their involvement and expectations on developing a reliable, trusting relationship and expanded the scope of their efforts only as the relationship strengthened.

In prescriptive matches, adult volunteers viewed their transformative goals as imperative, and set the goals, the pace and/or the ground rules for the relationship accordingly. These volunteers resisted adjusting their expectations of how quickly the youth would change, and ultimately felt frustrated. The youth were similarly frustrated and dissatisfied with the relationship; not surprisingly, they were far less likely to regard their partner as a source of consistent support. Morrow and Styles hypothesized that the developmental matches would generate more positive outcomes than prescriptive matches.

The importance of linking the type of relationship to outcomes is that agency staff, if armed with the knowledge that one type of volunteer produces greater impacts than another, could emphasize the selection of those volunteers during the screening process or train volunteers to adopt the characteristics of those volunteers—such as being non-judgmental about the youth and his/her family, and being a good and patient listener. Before implementing such a strategy, however, agency staff need firm evidence that one type of volunteer behaviors generated better results.

The second area for further research involves studying how the characteristics of the young person and the volunteer affect the outcomes. The overarching questions are: Is a certain type of youth better served by a mentoring intervention? Are volunteers who have experienced specific life circumstances better mentors? And perhaps most important, how should the characteristics of the volunteer and youth be taken into account when making a match? We might find that most youth could benefit from having a mentor and that many adults can successfully serve as one. If the number of adults and youth who participate in mentoring programs increases, however, so will the diversity of their life experiences, making it paramount that program staff make matches based on firm evidence of which youth will work best with a certain volunteer.

The third area for further research involves studying whether a minority youth matched with a white volunteer does equally well as a minority youth who is matched with a volunteer of the same racial/ethnic background. Currently, the number of minority youth, especially minority boys, requesting service from BBBS is greater than the number of minority Big Brothers and Big Sisters. The parents, youth and case managers must often decide between placing youth in a cross-race match or not matching the youth at all. Knowing how youth in cross-race matches fare relative to youth in same-race matches would greatly help in making this decision.

Previous research reported that the rate of meeting and the percentage of matches that formed developmental relationships were similar for same-race and cross-race matches (Morrow and Styles, 1995; Furano et al., 1993). Without impact estimates, however, they were unable to make conclusive statements regarding the relative efficacy of cross-race matches. It is important to address this issue, because until the number of minority volunteers equals the number of minority youth on the waiting lists, the only way to serve larger numbers of minority youth will be to make cross-race matches.

A final area for additional research would be a long-term follow-up study to examine whether the positive impacts observed in this study last and whether program participation affected other types of outcomes, such as sexual activity, criminal behavior, graduation from high school and employment.[22] Will the impressive impacts observed during the study period persist through

the teenage years and into adulthood, or will these positive results decay once the match ends? Previous research on youth programs has shown that after youth leave a program, impacts generally fade. However, since these results were generated by a developmentally oriented, non-targeted intervention, they might indeed last. Mentoring is not a magic bullet—a young person undoubtedly needs other supports to successfully transition to adulthood—but a longer-term study could show how mentoring fits as a critical component of making that transition.

Final Thoughts

P/PV began its mentoring work in 1988 wondering whether mentoring could make a difference in the life of a young person and, if it did, how a mentoring relationship achieved those results. The fourth in our series of BBBS studies shows that participating in a BBBS mentoring program—whose primary goal is to facilitate development of meaningful relationships between youth and adults that are reasonably intensive and persist over time—can make an important difference in the life of a young person. BBBS achieves its high proportion of long-lasting relationships by providing support to each match through a professional staff that follows well-developed quality standards.

If such standards and supports can be duplicated, the expansion and replication of mentoring initiatives for early adolescents would appear to be a strong and sensible investment. We estimate there are at least several million youth who could benefit from such an investment. However, the number of potentially qualified and interested volunteer mentors is unknown, as is the availability of financial support. It is extremely unlikely that major expansion and replication of the BBBS model could be accomplished entirely with private funds, given costs estimated at $1,000 annually per match. Public funding, too, seems unlikely, at a time when budgets for social programs are being drastically cut at the federal level, and when social policy interventions are widely viewed by the public as ineffective.

However, evidence of effectiveness like that contained in this report—especially around issues of drugs, violence and schooling—may influence the public's view of what can be accomplished, and may also stimulate policymakers to begin shaping a new and more effective social policy approach for youth—one that focuses less on specific problems after they occur, and more on meeting youth's most basic developmental needs.

Endnotes

1 Chapter V and Appendix A of the full report provide descriptions of the measures and analytical techniques used in the analysis.

2 Chapter V of the report provides detailed findings for the full sample, and for four subgroups: white boys, white girls, minority boys and minority girls,

3 The seven agencies that participated in at least one of P/PV's other studies were BBBS of Metropolitan Chicago; BBBS of Forsyth County (Winston-Salem, North Carolina); BB of Greater Indianapolis; BS of Central Indiana; BBBS of Jackson County (Michigan); BBBS of Marin County (California); and BB&S of Spokane, Washington.

4 The data reflect agency operations in 1992, the main enrollment period for sample members.

5 We define active caseload size as the number of currently meeting pairs in a one-to-one match.

6 Criminal driving violations, such as driving while intoxicated, would surface during the police check.

7 We did not include delaying the onset of sexual behavior or promoting "safer" sex practices as possible outcomes, primarily because BBBSA does not consider these issues primary goals of a BBBS relationship, especially at the age of most of the sample members.

8 Age-eligible was defined as 10 to 16 years old. At one agency, the minimum age was 11, and agencies' maximum age for participation varied from 13 to 16. The difference in the maximum age reflected the agencies' policies regarding the matching of older youth. Several study agencies do not match 15- to 17-year-old youth. Because the agencies wanted to offer control group youth a realistic chance of being matched at the conclusion of the study period, we lowered the maximum age for these agencies.

9 Case managers explained the study directly to about two-thirds of the youth. When youth did not accompany their parent to the group session or one-to-one interview, the parents explained the study to their son or daughter.

10 The key informant was usually the person referred to herein as the research liaison, who served as the point of contact between P/PV and the local agencies.

11 A chi-squared test, presented in Appendix A, Table A.5, indicated that treatment and control groups were statistically similar at baseline.

12 The 409 figure is higher than the total number of ever-matched treatments because some Little Brothers and Little Sisters had more than one match.

13 The normal procedure when a match ends is to first review the reason that it ended. If that reason does not suggest that the Little Brother or Little Sister is no longer appropriate for the program (for example, if the match ended because the volunteer moved to another state), the case manager has the option of matching the Little Brother or Little Sister with another Big Brother or Big Sister. Of the 171 matches that ended during the study period, 31 youth were matched with a second Big Brother or Big Sister. We instructed agency staff to follow their normal matching and supervision practices during the course of the study. Total exposure, therefore, is defined as the total length of time that a treatment youth had been meeting with a Big Brother or Big Sister (both the first and, if applicable, second one) at the time of the follow-up interview.

14 The behavioral outcomes generally referred to how often the respondent had engaged in the indicated activity over the previous 12 months. For seven outcomes, we asked respondents how many hours per week they engaged in the indicated activity during the *school* year (e.g., doing homework, participating in school clubs or organizations).

15 We followed the standard evaluation practice of comparing adjusted treatment and control means. Specifically, impacts were estimated using multivariate techniques (regressions and logits), controlling for baseline characteristics. See Appendix A for more details.

16 The net impact estimates presented in the tables and discussed in the text represent the average impact of the program on all individuals who were randomly assigned to the treatment group, regardless of whether they were matched. At the time of the follow-up survey, 78 percent of the treatment youth in the analysis sample had been matched with a volunteer and, on average, those who had been matched had met with their Big Brother or Big Sister for about one year. The estimates of the impact on the whole treatment group are, therefore, a weighted average of the impacts on those who were matched and those who were not matched.

17 Methodological research on the validity of self-reported delinquent behavior consistently supports the conclusion that these measures are acceptable by conventional social science standards (Huizinga and Elliot, 1986; Sampson, 1985; Hindelong et al., 1981).

18 Throughout the report, we present the net impacts in terms of the percent change in an outcome induced by the program. To calculate the percent change, the net impact was divided by the follow-up control mean. Both the net impact and the control mean appear in the tables.

19 Research has shown that self-reported grades are a reasonably accurate gauge of a student's school performance (Sawyer et al., 1989; Fetter et al., 1984; Armstrong et al., 1976). Almost all the studies found little difference between self-reports of grades and school records, with a correlation between the two scores of about .80.

20 We converted grade information into the more familiar grade point average (GPA) scale, which runs from 0 to 4. Mostly Ds and Fs were assigned 0.5; mostly Ds were 1.0; mostly Cs and Ds 1.5; mostly Cs 2.0; mostly Bs and Cs 2.5; mostly Bs 3.0; mostly Bs and As 3.5; mostly As 4.0.

21 In 5 percent of the cases, the guardian was the grandmother, and in 2 percent it was some other female relative. In only 4 percent of the cases was the father the custodial parent. The remaining 3 percent of the sample had a variety of other living arrangements.

22 Before pursuing a longer-term study, we would have to conduct methodological work to see whether such a study would be possible. If a significant number of *control* youth were matched after the end of the study period, it would not be possible to do a longer-term study.

References

Amemiya, T.
1981 "Qualitative Response Models." *Journal of Economic Literature,* Vol.19, 1438-56.

Armsden, Gay C., and Mark T. Greenberg
1987 "The Inventory of Parent and Peer Attachment (IPPA): Relationships to Well-Being in Adolescence." *Journal of Youth and Adolescence*, 16(5), 427-54.

Armstrong, R.J., J.A. Jensen, R.F. McCaffrey, and C.H. Reynolds
1976 "The Accuracy of Self-Reported Class Rank." *National ACACA Journal*, 21, 37-42.

Beiswinger, George L.
1985 *One to One: The Story of the Big Brothers/Big Sisters Movement in America*. Philadelphia: Big Brothers/Big Sisters of America.

Belle, Deborah
1989 "Gender Differences in Children's Social Networks and Supports," in Deborah Belle (ed.). *Children's Social Networks and Supports*. New York: John Wiley & Sons.

Berndt, Thomas J., and Kristelle E. Miller
1990 "Expectancies, Values and Achievement in Junior High School." *Journal of Educational Psychology*, 82(2), 319-26.

Berndt, Thomas J., and T. Bridgett Perry
1986 "Children's Perceptions of Friendships as Supportive Relationships." *Developmental Psychology*, 22(5), 640-48.

Big Brothers/Big Sisters of America
1988 *Program Management Manual*. Philadelphia: Big Brothers/Big Sisters of America.

Bretherton, Inger
1985 "Attachment Theory: Retrospect and Prospect," in I. Bretherton and E. Walker (eds.). *Growing Points of Attachment Theory and Research. Monographs of the Society for Research in Child Development*, 50:1-2, No. 209.

Bryant, Brenda K.
1989 "The Need for Support in Relation to the Need for Autonomy," in Deborah Belle (ed.). *Children's Social Networks and Supports*. New York: John Wiley & Sons.

Carnegie Council on Adolescent Development
1995 *Great Transitions*. Washington, D.C.: Carnegie Council on Adolescent Development.

Carnegie Council on Adolescent Development
1989 *Turning Points: Preparing American Youth for the 21st Century*. Washington, D.C.: Carnegie Council on Adolescent Development.

Chaskin, Robert, and Theresa Hawley
1994 *Youth and Caring: Developing a Field of Inquiry and Practice*. Chicago: Chapin Hall Center for Children.

Cobb, S.
1976 "Social Support as a Moderator of Life Stress." *Psychosomatic Medicine*, 38, 300-314.

Cohen, Sheldon, and S. Leonard Syme
1985 "Issues in the Study and Application of Social Support," in S. Cohen and S.L. Syme (eds.). *Social Support and Health*. Orlando, Fla.: Academic Press.

Cooley, C.H.
1992 *Human Nature and the Social Order*. New York: Scribner.

Cowen, Emory L., and William C. Work
1988 "Resilient Children, Psychological Wellness and Primary Prevention." *American Journal of Community Psychology*, 16(4), 591-607.

Cronbach, L.J.
1951 "Coefficient Alpha and the Internal Structure of Tests." *Psychometrika*, Vol. 16, 297-334.

Dryfoos, Joy G.
1990 *Adolescents At Risk: Prevalence and Prevention*. New York: Oxford University Press.

Elliot, Delbert S.
1993 "Health-Enhancing and Health-Compromising Lifestyles," in Susan Millstein, Anne C. Petersen and Elena O. Nightingale (eds.). *Promoting the Health of Adolescents*. New York: Oxford University Press.

Ferguson, Ronald F.
1990 *The Case for Community-Based Programs that Inform and Motivate Black Male Youth*. Washington, D.C.: Urban Institute.

Fetter, W.B., P.S. Stowe, and J.A. Owings
1984 *Quality of Responses of High School Students to Questionnaire Items. High School and Beyond: A National Longitudinal Study for the 1980s*. Washington, D.C.: U.S. National Center for Education Statistics.

Freedman, Marc
1992 *The Kindness of Strangers: Reflections on the Mentoring Movement*. Philadelphia: Public/Private Ventures.

Furano, Kathryn, Phoebe A. Roaf, Melanie B. Styles, and Alvia Y. Branch
1993 *Big Brothers/Big Sisters: A Study of Program Practices*. Philadelphia: Public/Private Ventures.

Furstenberg, Frank
1993 "How Families Manage Risk and Opportunity in Dangerous Neighborhoods," in William Julius Wilson (ed.). *Sociology and the Public Agenda*. New York: Sage.

Gambone, Michelle Alberti
1993 *Strengthening Programs for Youth: Promoting Adolescent Development in the JTPA System*. Philadelphia: Public/Private Ventures.

Garmezy, Norman
1985 "Stress-Resistant Children: The Search for Protective Factors," in J.E. Stevenson (ed.). *Recent Research in Development Psychopathology*. Oxford: Pergamon Press.

Gottlieb, Benjamin H.
1988 "Marshalling Social Support: The State of the Art in Research and Practice," in B.H. Gottlieb (ed.). *Marshalling Social Support*. Beverly Hills: Sage Publishers.

Greim, Jeffrey L.
1992 *Adult/Youth Relationships Pilot Project: Initial Implementation Report*. Philadelphia: Public/Private Ventures.

Grossman, Jean B., and Bonnie L. Halpern-Felsher
1992 *Research Findings on the Effectiveness of Youth Programming: Support for a Developmental Approach*. Philadelphia: Public/Private Ventures.

Haensly, Patricia A., and James L. Parsons
1993 "Creative, Intellectual, and Psychosocial Development Through Mentorship: Relationships and Stages." *Youth and Society*, 25(2), 202-221.

Harter, Susan
1990 "Developmental Differences in the Nature of Self-Representations: Implications for the Understanding, Assessment, and Treatment of Maladaptive Behavior." *Cognitive Therapy and Research*, 14(2), 113-142.

Harter, Susan
1985 *Manual for the Self-Perception Profile for Children*. Denver: University of Denver.

Higgins, Catherine, Kathryn Furano, Catharine Toso, and Alvia Y. Branch
1991 *I Have A Dream in Washington, D.C*. Philadelphia: Public/Private Ventures.

Hirsch, Barton J., and Thomas Reischl
1985 "Social Networks and Developmental Psychopathology: A Comparison of Adolescent Children of a Depressed, Arthritic, or Normal Parent." *Journal of Abnormal Psychology*, 94(3), 272-281.

Hobfoll, Steven E.
1985 "Limitations of Social Support in the Stress Process," in I.G. Sarason and B.R. Sarason (eds.). *Social Networks and Social Support.* Beverly Hills: Sage Publishers.

Hindelong, M.J., T. Hirschi, and J.G. Weis
1981 *Measuring Delinquency*. Beverly Hills: Sage Publishers.

Huizinga, David, and Delbert S. Elliot
1986 "Reassessing the Reliability of Validity of Self-Report Delinquency Measures." *Journal of Quantitative Criminology*, 2(4), 293-327.

Jenks, Christopher, and Susan Mayer
1990 "The Social Consequences of Growing Up in a Poor Neighborhood: A Review," in M. McGeary and L. Lynn (eds.). *Inner-City Poverty in the United States*. Washington, D.C.: National Academy Press.

Jessor, Richard
1993 "Successful Adolescent Development Among Youth in High-Risk Settings." *American Psychologist*, 48(2), 117-126.

Maccoby, Eleanor
1990 "Gender and Relationships: A Developmental Account." *American Psychologist*, 45(4), 513-520.

McLoyd, Vonnie
1990 "The Impact of Economic Hardship on Black Families and Children: Psychological Distress, Parenting and Socioemotional Development." *Child Development*, 61, 311-346.

Mead, George Herbert
1934 *Mind, Self and Society*. Chicago: University of Chicago Press.

Mecartney, Crystal A., Melanie B. Styles, and Kristine V. Morrow
1994 *Mentoring in the Juvenile Justice System: Findings from Two Pilot Programs*. Philadelphia: Public/Private Ventures.

Morrow, Kristine V., and Melanie B. Styles
1995 *Building Relationships With Youth in Program Settings: A Study of Big Brothers/Big Sisters*. Philadelphia: Public/Private Ventures.

Nicholson, Heather Johnston
1992 *Gender Issues in Youth Development Programs*. New York: Carnegie Council on Adolescent Development.

Ogbu, John H.
1981 "Origins of Human Competence: A Cultural-Ecological Perspective." *Child Development,* 52, 413-429.

Petersen, Anne, John Schulenberg, Robert Abramowitz, Daniel Offer, and Harold Jarcho
1984 "A Self-Image Questionnaire for Young Adolescents (SIQYA): Reliability and Validity Studies." *Journal of Youth and Adolescence*, 13(2), 93-111.

Pittman, Karen
1992 *Defining the Fourth R: Youth Development Through Building Relationships*. Washington, D.C.: Academy for Educational Development.

Roaf, Phoebe A., Joseph P. Tierney, and Danista E.I. Hunte
1994 *Big Brothers/Big Sisters of America: A Study of Volunteer Recruitment and Screening*. Philadelphia: Public/Private Ventures.

Rutter, Michael
1987 "Psychosocial Resilience and Protective Mechanisms." *American Journal of Orthopsychiatry*, 57, 316-331.

Sampson, Robert J.
1985 "Sex Differences in Self-Reported Delinquency and Official Records: A Multiple Group Structural Modeling Approach." *Journal of Quantitative Criminology*, 1, 345-366.

Sandler, Irwin N., Paul Miller, Jerome Short, and Sharlene A. Wolchick
1989 "Social Support as a Protective Factor for Children in Stress," in Deborah Belle (ed.). *Children's Social Networks and Supports*. New York: John Wiley & Sons.

Sawyer, Richard, Jean Laing, and Walter Houston
1989 "Accuracy of Self-Reported High School Courses and Grades of College-Bound Students." *College and University*, 280-299.

Scales, Peter C.
1991 *A Portrait of Young Adolescents in the 1990s: Implications for Promoting Healthy Growth and Development*. Carrboro, N.J.: Center for Early Adolescence.

Schonert-Reichl, Kimberly A., and Daniel Offer
1992 *Seeking Help and Social Support in Adolescence: The Role of Non-Related Adults*. New York: Institute for Urban and Minority Education, Teachers College, Columbia University.

Spencer, Margaret Beale, Dena Phillips Swanson, and Michael Cunningham
1991 "Ethnicity, Ethnic Identity, and Competence Formation: Adolescent Transition and Cultural Transformation." *Journal of Negro Education*, 60(3), 366-387.

Steinberg, Lawrence
1991 "The Logic of Adolescence," in P. Edelman and J. Ladner (eds.). *Adolescence and Poverty: Challenge for the 1990s*. Washington, D.C.: Center for National Policy Press.

Styles, Melanie B., and Kristine V. Morrow
1992 *Understanding How Youth and Elders Form Relationships: A Study of Four Linking Lifetimes Programs*. Philadelphia: Public/Private Ventures.

Tanner, Deborah
1990 "Gender Differences in Conversational Coherence: Physical Alignment and Topical Cohesion," in Bruce and Duvall (eds.). *Conversational Coherence and Its Development*. Norwood, N.J.: Ablex.

Tietjen, Anne Marie
1989 "The Ecology of Children's Social Support Networks," in Deborah Belle (ed.). *Children's Social Networks and Supports*. New York: John Wiley & Sons.

Tierney, Joseph P., and Alvia Y. Branch
1992 *College Students as Mentors for At-Risk Youth: A Study of Six Campus Partners in Learning Programs*. Philadelphia: Public/Private Ventures.

Unger, D.G., and A. Wandersman
1985 "The Importance of Neighbors: The Social, Cognitive, and Affective Components of Neighboring." *American Journal of Community Psychology*, 13, 139-169.

United States Bureau of the Census
1994 *Statistical Abstract of the United States*, 114th Edition. Washington, D.C.: U.S. Bureau of the Census.

Werner, Emmy, and Ruth Smith
1992 *Overcoming the Odds: High-Risk Children from Birth to Adulthood*. Ithaca: Cornell University Press.

Werner, Emmy, and Ruth Smith
1982 *Vulnerable But Invincible: A Longitudinal Study of Resilient Children and Youth*. New York: McGraw Hill.

Wilcox, B.L., and E.M. Vernberg
1985 "Conceptual and Theoretical Dilemmas Facing Social Support Research," in I.G. Sarason and B.R. Sarason (eds.). *Social Support: Theory, Research and Applications*. The Hague: Martinus Nijhoff Publishers.

Wilson, William J.
1987 *The Truly Disadvantaged: The Inner City, the Underclass and Public Policy*. Chicago: University of Chicago Press.

Zaslow, Martha J., and Ruby Takanishi
1993 "Priorities for Research on Adolescent Development." *American Psychologist*, 48(2), 185-192.

Appendix A
Study Methods

This appendix presents details on the outcome measures we used and how we estimated the impact of the program on these outcome measures. It first presents the specific measures in each of the six outcome areas (antisocial activities, academic outcomes, family relationships, peer relationships, self-concept, and social and cultural enrichment). It then provides the reader with some of the psychometric properties of the scales in our sample. Next, it describes the administration of the baseline and follow-up surveys. Finally, we lay out the estimation techniques used to infer the program's impacts.

Outcome Measures

After determining the outcome areas potentially affected by participation in a BBBS program, we reviewed the existing social-psychological and behavioral measures, using those that were appropriate for the study population and developing our own when the existing measures were not adequate.

Table A.1 presents the social-psychological and behavioral measures included on the questionnaires. The final baseline and follow-up questionnaires included 48 outcome measures of behaviors and social-psychological constructs across six outcome areas. Fifteen outcomes assessed antisocial activities. Ten assessed academic outcomes, including two social-psychological constructs and eight behavioral measures. To assess family relationships, we used four scales from the Inventory of Parent and Peer Attachment (IPPA) and one behavioral measure. Five measures of peer relationships were included. Three measures assessed attitudes toward self. Thirteen single-item questions tapped social and cultural enrichment behaviors.

The rest of this section discusses the measures used, the pretest of the survey instrument, and the reliability of the included measures.

Measure Selection

In selecting measures, we tried to use scales that had been validated in previous research. When using an instrument, we adopted a strategy of keeping subscales intact. That is, if a measure of a particular construct included 10 items, we retained all 10 rather than trying to assess that construct with only five or seven of the original 10 items.[1]

To tap antisocial behavior, we relied primarily on questions used in previous P/PV research studies, but we also adapted questions developed by Thomas Cook for an evaluation of a middle school reform project. The single items assessing antisocial behaviors included questions about the number of times the youth used drugs or alcohol, hit someone, stole something, took something from a store, damaged property, was involved in a fight, did "risky" things, was sent to the principal's office, and cheated on a test. The Behavioral Conduct subscale of Harter's (1985) Self-Perception Profile for Children was also chosen as an indicator of potential behavioral changes.[2]

To measure attitudes toward school, we wanted items that could assess general improvements in motivation, attitude and achievement, since these are common goals for BBBS matches. We chose to use Harter's (1985) Scholastic Competence scale to measure the youth's perceived ability to complete schoolwork, and Berndt and Miller's (1990) School Value scale because they gauge the value of school in general—not just specific classes.

In addition to these two measures of attitude (Scholastic Competence and School Value), academic outcome measures included single items assessing behaviors: grades, number of times skipped class, number of times skipped school, number of visits to a college, number of books read, number of trips to a library, number of hours spent on homework, and number of hours spent reading.

To examine youth's relationship with their parent, we used scales in the Inventory of Parent and Peer Attachment (IPPA) (Armsden and Greenberg, 1987). The IPPA was designed to measure attachment to parents along three dimensions—trust, quality of communication, and extent of anger and alienation. Although it was developed for use with older adolescents, it had been used successfully with younger adolescents as well. The specific scale we used was the Relationship with Mother scale, because the vast majority of BBBS clients reside with their mothers and have no regular contact with their fathers. (Interviewers were instructed to substitute "father" or "guardian" for "mother" where appropriate.) In addition to these attitudinal measures, we asked one behavioral item: the number of times the youth lied to their parent in the past 12 months.

To tap the quality of peer interaction or friendship, we used five subscales from Berndt and Perry's (1986) Features of Children's Friendship because they gauge the extent to which children believe they have close, supportive relationships with their friends, and because it was developed with younger youth, second- to eighth-graders. The subscales were: Intimacy in Communication, Instrumental Support, Emotional Support, Conflict, and Inequality.

Table A.1 Outcome Measures

Antisocial Activities
Behavioral Conduct[a]
Initiated drug use
Initiated alcohol use
Number of times stole something in past year
Number of times took something from store in past year
Number of times damaged property in past year
Number of times involved in a fight in past year
Number of times hit someone in past year
Number of times did "risky" things in past year
Number of times sent to principal's office in past year
Number of times cheated on test in past year
Used tobacco in past 30 days

Academic Outcomes
Scholastic Competence[a]
School Value[b]
Grades
Number of times skipped class
Number of days skipped school
Number of visits to a college
Number of books read
Number of trips to a library
Weekly hours spent on homework
Weekly hours spent reading

Family Relationships
Inventory of Parent & Peer Attachment (IPPA)[c]
IPPA Communication Subscale[c]
IPPA Trust Subscale[c]
IPPA Anger and Alienation Subscale[c]
Number of times lied to parent in past year

Peer Relationships
Intimacy in Communication Subscale[d]
Instrumental Support Subscale[d]
Emotional Support Subscale[d]
Conflict Subscale[d]
Inequality Subscale[d]

Self-Concept
Global Self Worth[a]
Social Acceptance[a]
Mastery & Coping Subscale[e]

Social and Cultural Enrichment
Weekly hours in sport or recreation programs
Weekly hours in volunteer or community service
Weekly hours in art, music or dance lessons
Weekly hours in school clubs or organizations
Weekly hours in youth groups
Number of times attended sporting event in past year
Number of times attended a play in past year
Number of times attended professional dance performance in past year
Number of times attended music concert in past year
Number of times participated in an outdoor activity in past year
Number of times visited a museum in past year
Total weekly hours spent in social and cultural activities
Total attendance at social and cultural events in past year

[a] From "Self-Perception Profile for Children" (Harter, 1985)
[b] Adapted from "School Value Scale" (Berndt and Miller, 1990)
[c] "Inventory of Parent and Peer Attachment (IPPA)" (Armsden and Greenberg, 1987)
[d] From "Features of Children's Friendship Scale" (Berndt and Perry, 1986)
[e] Adapted from "Self-Image Questionnaire for Young Adolescents" (Petersen et al., 1984)

We considered several alternative measures of self-concept, including Harter's (1985) SelfPerception Profile for Children, and Petersen et al.'s (1984) Self-Image Questionnaire for Young Adolescents (SIQYA). The SIQYA was developed specifically for use with young adolescents (11- to 13-year-olds) and contains nine scales that tap different aspects of self-image; however, it does not include a scale designed to tap general self-worth. We retained the SIQYA Mastery and Coping scale with minor wording changes and a change in the response categories from six to four. The Global Self Worth and Social Acceptance subscales from Harter's Self-Perception Profile for Children were also retained, as measures of attitudes toward self.

Thirteen single-item questions that tapped social and cultural enrichment behaviors and activities are listed in Table A.1. These included questions asking the youth how many hours per week they spent in sport or recreation programs; volunteer or community service, art, music or dance lessons; school clubs and organizations; or youth groups, as well as questions asking how many times during the past year they had attended specific social and cultural events, such as sporting events, plays, professional dance performances, music concerts, outdoor activities, and museums. The total weekly hours and number of events attended were both computed as additional outcome measures.

Review and Pretest

Two psychologists, Thomas Berndt and Susan Harter, reviewed the baseline questionnaire for its suitability for addressing the study's research hypotheses. After further review by P/PV research staff, the baseline questionnaire was pretested with currently matched Little Brothers and Little Sisters from two agencies in the Philadelphia area. A survey firm conducted telephone interviews with 15 youth aged 11 to 16. The pretest was designed to study how well youth understood the items on the questionnaire and whether youth this age could be successfully interviewed by telephone. The pretest went well, with interviewers reporting that the youth understood the questions and were able to answer them easily. Only minor revisions to the instrument were made based on feedback from the pretest.

Reliabilities

We have reevaluated the internal consistency reliabilities of each scale for our study sample, both at baseline and at follow-up, to help assess whether the scales "worked" as measures of specific outcomes for the BBBS sample.

The reliability of a scale refers to its stability, i.e., how consistently the scale measures an underlying construct. Coefficient alpha (Cronbach, 1951) is a statistic used to assess internal consistency reliability, the degree to which scale items each measure a common underlying attribute.[3] Values of alpha range from 0 (indicating no internal consistency—that the items have literally nothing in common) to 1 (indicating perfect consistency among the items—that each item is perfectly correlated with the scale as a whole). We consider values above .60 to be acceptable.

Alpha values were calculated for all 15 scales used as outcome measures. Internal consistencies were all acceptable, ranging from .61 to .86 at the baseline administration, and from .61 to .90 at the follow-up administration. The reliability coefficients at both baseline and follow-up are listed in Table A.2. The alpha values for the scales for which there was a significant overall effect—Scholastic Competence, Emotional Support, Inventory of Parent and Peer Attachment (IPPA), and the IPPA Trust Subscale—had alpha values from .68 to .90. Table A.3 presents the baseline mean and potential range of the scales.

Survey Administration

From October 1991 through February 1993, 1,138 youth were randomly assigned to either the treatment or control group, with 1,107 (97.3%) completing a baseline interview. From April 1993 to September 1994, 18-month follow-up interviews were attempted with every youth who completed a baseline survey. Of the 1,107 youth with whom interviews were attempted, 971 (87.7%) completed the follow-up survey. Of the 1,138 youth who were randomly assigned, 971 (85.3%) completed a baseline and follow-up survey.

The Baseline Survey

The case managers who described the study to the parents and guardians during the intake process explained that completing a baseline survey was a condition of their participation and that failure to complete the baseline would cause the agency to stop processing their request for a Big Brother or Big Sister. Linking continued participation in the BBBS program to completion of the baseline interview, coupled with the collection of current locating information, resulted in the 97.3 percent response rate to this telephone survey. Of the 31 youth who did not complete an interview, 14 refused to participate,[4] eight could not be located, and nine did not complete the interview for a variety of reasons.

Table A.2 Internal Consistency of Scales Used as Outcome Measures, Assessed at Baseline and Follow-Up

		Coefficient Alpha	
	Items	Baseline	Follow-up
Antisocial Activities			
Behavioral Conduct[a]	6	.72	.76
Academic Outcomes			
Scholastic Competence[a]	6	.68	.77
School Value[b]	18	.73	.79
Family Relationships			
Inventory of Parent & Peer Attachment[c]	23	.86	.90
IPPA Communication Subscale[c]	9	.72	.81
IPPA Trust Subscale[c]	7	.73	.84
IPPA Anger and Alienation Subscale[c]	8	.77	.80
Peer Relationships			
Intimacy in Communication Scale[d]	4	.66	.72
Instrumental Support Scale[d]	4	.61	.61
Emotional Support Scale[d]	4	.69	.73
Conflict Scale[d]	4	.66	.67
Inequality Scale[d]	4	.68	.69
Self-Concept			
Global Self Worth[a]	6	.71	.75
Social Acceptance[a]	6	.69	.74
Mastery & Coping Subscale[e]	9	.63	.73

[a] From "Self-Perception Profile for Children" (Harter, 1985)
[b] Adapted from "School Value Scale" (Berndt and Miller, 1990)
[c] "Inventory of Parent and Peer Attachment (IPPA)" (Armsden and Greenberg, 1987)
[d] From "Features of Children's Friendship Scale" (Berndt and Perry, 1986)
[e] Adapted from "Self-Image Questionnaire for Young Adolescents" (Petersen et al., 1984)

Table A.3 Descriptive Statistics of Scales Used as Outcome Measures

		Range	
	Mean at Baseline	Minimum	Maximum
Antisocial Activities			
Behavioral Conduct[a]	16.89	6	24
Academic Outcomes			
Scholastic Competence[a]	16.00	6	24
School Value[b]	56.49	18	72
Family Relationships			
Inventory of Parent & Peer Attachment[c]	71.79	23	92
IPPA Communication Subscale[c]	28.34	9	36
IPPA Trust Subscale[c]	24.51	8	28
IPPA Anger and Alienation Subscale[c]	21.48	7	32
Peer Relationships			
Intimacy in Communication Scale[d]	10.95	4	16
Instrumental Support Scale[d]	12.48	4	16
Emotional Support Scale[d]	12.39	4	16
Conflict Scale[d]	11.11	4	16
Inequality Scale[d]	11.50	4	16
Self-Concept			
Global Self Worth[a]	17.98	6	24
Social Acceptance[a]	17.18	6	24
Mastery & Coping Subscale[e]	28.17	9	36

[a] From "Self-Perception Profile for Children" (Harter, 1985)
[b] Adapted from "School Value Scale" (Berndt and Miller, 1990)
[c] "Inventory of Parent and Peer Attachment (IPPA)" (Armsden and Greenberg, 1987)
[d] From "Features of Children's Friendship Scale" (Berndt and Perry, 1986)
[e] Adapted from "Self-Image Questionnaire for Young Adolescents" (Petersen et al., 1984)

The Follow-Up Survey

We attempted phone contact with every sample member who completed a baseline interview 18 months after that interview. We used field interviewers when a sample member or their parent/guardian avoided or refused to complete the interview, or when the contact information yielded no strong leads. Field interviewers completed 105 interviews (9.5%). To further enhance the response rate, we offered financial incentives to sample members who repeatedly avoided the interviewers, missed scheduled appointments to complete the interview or refused to complete the interview. We paid incentives totalling $1,010 to 96 sample members.

A total of 136 sample members did not complete follow-up interviews. Of these, 59 could not be located, 73 refused to participate,[5] and four were not interviewed for other reasons.

The Analysis Sample

Twelve cases were eliminated from the 971 who completed both baseline and follow-up surveys because information from the follow-up survey revealed that they had actually been ineligible at baseline or that their control status had been compromised. Five, including four controls, had been matched within the 12 months prior to random assignment, making them ineligible for the study. In addition, seven controls had mistakenly been matched before the follow-up survey was administered. The remaining 959 cases made up the analysis sample.

The final analysis sample consisted of 487 treatments and 472 controls, representing 85.3 percent of all treatments and 83.2 percent of all controls who had been randomly assigned.

Analytic Strategies

Before conducting any analyses, comparability of the treatment and control groups was assessed. Given the tightly controlled random assignment procedures, similarity between the two groups was expected. T-tests were used to compare means for the treatment and control groups at baseline on outcome variables and demographic and descriptive characteristics. No systematic or statistically significant treatment/control differences were found. Thus, we feel confident that random assignment worked in constructing two statistically identical groups and that the estimated coefficient on treatment group assignment (T) is an unbiased estimate of the program's impact. Many of the baseline characteristics for the two groups are shown in Table A.4.

Estimation of the Model

Estimation of the impact of participation in BBBS relied heavily on multivariate analysis.

In general, the multivariate model used to estimate the impact of BBBS on various outcome measures took the following form:

(1) $Y2 = a + b1Y1 + b2X + b3T + e1$

where:

Y2	=	the follow-up (18-month) value of the variable of interest
Y1	=	the baseline value of the variable of interest
X	=	a vector of explanatory variables
T	=	whether the youth received BBBS treatment
a, bi	=	coefficients
ei	=	a stochastic disturbance term with a mean of zero and a constant variance

The explanatory variables (X) included in the model were the baseline measures listed in Table A.5. They include such items as age, gender and race/ethnicity; whether the youth had repeated a grade or had been a victim of physical, emotional or sexual abuse; dummy variables for the agency; and variables that describe the youth's home environment, such as household income, whether the household received cash welfare payments or food stamps, and number of siblings.

This specification made it possible to estimate the impact of BBBS more precisely by controlling for preexisting differences among youth.[6] The estimated impact of BBBS is the coefficient on the dichotomous variable T, b3.

Table A.4 Explanatory Variables Used in Regression Models (Measured at Baseline)

Youth's Characteristics
Gender
Age
Race/ethnicity
Repeated a grade
Previously had a Big Brother or Big Sister
Previously had any other non-family mentor
Physical abuse victim
Emotional abuse victim
Sexual abuse victim
Experienced death of significant other
Experienced divorce of parent/guardian
Experienced serious illness of a significant other
Referred to BBBS by a parent
Currently in counseling

Youth's Home Environment
Parent working full time
Family receiving cash welfare payments or food stamps
Family history of domestic violence
Family history of substance abuse
Youth moved more than twice since starting school
Number of siblings
Parent present
Parent/guardian ever married
Parent/guardian gender
Parent/guardian education
Parent/guardian a teen parent
Live in urban neighborhood
Learning disability[a]

Baseline Measure of Outcome Variables

Agency

Parent and Case Manager Assessment of Youth
Underachiever in school[a]
Overly dependent[b, c]
Poor social skills[b, c, d]
Few friends[b, d]
Not thinking well of him/herself [b, d]
Needs adult attention[c]
Uncomfortable with adults[c]
Poor relationship with parent/guardian[c]
Few opportunities to do things[e]
Older siblings with problems[f]

[a] Included in models estimating impact on academic outcomes.
[b] Included in models estimating impact on peer relationships.
[c] Included in models estimating impact on family relationships.
[d] Included in models estimating impact on attitudes toward self.
[e] Included in models estimating impact on social and cultural opportunities.
[f] Included in models estimating impact on antisocial activities.

Table A.5 Selected Baseline Characteristics

	Range	Treatment
Age	12.3	12.2
Male	62%	63%
Minority	59%	55%
With One or More Siblings	91%	88%
Family Receiving Welfare	43%	44%
Moved Two or More Times Since 1st Grade	61%	60%
Parent/Guardian Never Married	25%	23%
Ever Repeated a Grade	37%	37%
Grades (GPA)	2.75	2.79
Number of Classes Skipped in Prior 12 Months	.41	.56
Number of Times Hit Someone	2.6	3.0
Number of Times Lied to Parent	2.2	2.41
Quality of Parental Relationship	71.79	71.68
Emotional Support	12.40	12.40
Self-Worth	17.91	18.06

Note: Differences between the control and treatment groups were not statistically different at the 0.10 level.

In addition to estimating the overall effect of the program using equation (1), a series of subgroup-treatment interaction variables were used to estimate the effect of BBBS on gender and racial/ethnic subgroups. Algebraically, equation (1) was modified as follows:

(2) $Y2 = a + b1Y1 + b2X + b3T + c1TM + e2$

(3) $Y2 = a + b1Y1 + b2X + b3T + c1TGR1 + c2TGR2 + c3TGR3 + e2$

where: M = a dummy variable that equals 1 for males

GRi = gender/race dummy variables for white girls, minority girls and minority boys[7]

Ci = coefficients

Subgroup impacts presented in the report, such as those for minority females, are average impacts for all individual subgroup members.[8]

The use of ordinary least squares (OLS) was not warranted when the dependent variable was dichotomous, such as in the case of whether a participant initiated drug or alcohol use.[9] In such cases, logistic regression analysis, using maximum likelihood estimation, was used to estimate the treatment impact by specifying a linear function for the logit (the logarithm of the odds) of having a positive response (e.g., initiating drug use):

(4) $\log(p/[1-p]) = a + b2X + b3T + e1$

where: p = the probability that Y2 = 1

1-p = the probability that Y2 = 0

a, bi, T and ei are defined as in equation (1), but on a logit scale.

Only those youth who, at baseline, had reported never having used illegal drugs were included in the logistic regression analyses estimating the impact of BBBS on initiation of drug use. Similarly, only those youth who had at baseline reported never having used alcohol were included in the analyses estimating impact on initiation of alcohol use. Therefore, the baseline assessment of these outcome variables was not included in these models.

As in the OLS models, explanatory variables controlling for pre-existing differences among the youth are included in the logit models, and subgroup-treatment interaction variables are included in models estimating impacts for gender and race/gender subgroups.

The key finding of the analysis is whether BBBS has an effect on various outcome measures. In the discussion of the results, we indicate whether an impact estimate is statistically different from zero by labeling statistically non-zero estimates as “significant.” In this report, the term is reserved for estimates that were not equal to zero at a 0.10 or greater level of significance using a two-tailed t-test. These “significant” impacts are indicated in the tables with asterisks (*).

When discussing subgroup estimates, a second finding is also of interest: whether the effect of BBBS differed with respect to a particular characteristic, such as gender. An F-test of whether the subgroup impacts differ from one another was conducted for all subgroup analyses. If the subgroup impacts are not statistically equivalent to each other, we indicate this in the tables with pound signs (#).

In summary, a variety of analytic strategies were used to evaluate the impact of participation in BBBS. The fundamental approach used a dummy variable (indicating treatment or control group status) in an OLS regression. Other analyses (e.g., logit analysis) were used where the assumptions of the OLS model were likely to be violated, such as when the outcome variable was dichotomous.

Appendix B
Additional Tables

The first four tables in this appendix present the net impacts for outcome variables that, with one exception, did not have a statistically significant overall effect. The exception is the finding that Little Brothers and Little Sisters participated in significantly fewer outdoor activities than control youth. The remaining two tables provide additional information about the study agencies.

Table B.1 Net Impact of Participation in BBBS on Antisocial Activities

	Behavioral Conduct		Number of Times Took Something From Store		Number of Times Involved in a Fight		Number of Times Did "Risky" Things	
	Net Impact	Follow-up Control Mean	Net Impact	Follow-up Control Mean	Net Impact	Follow-up Control Mean	Net Impact	Follow-up Control Mean
Overall	.21	16.83	.04	0.24	.02	1.54	-.21	1.22
Gender								
Male	.03	16.76	-.07	0.27	.03	1.83	-.31	1.40
Female	.52	16.96	.02	0.20	.01	1.05	-.05	.92
Race/Gender								
Minority Male	-.28	17.09	-.09	0.30	.51	1.66	-.14	1.16
Minority Female	1.23**	16.40	.02	0.20	-.12	1.21	.14	0.70
White Male	.45	16.32	-.04	0.23	-.56	2.07	-.52	1.72
White Female	-.60	17.91	.00	0.20	.16	0.78	-.34	1.29

Note: The size of the analysis sample was 959: 217 minority girls, 142 white girls, 326 minority boys, 271 white boys, and 3 youth who did not give their race.
** Indicates that the impact differs statistically from zero at the 0.05 level.
* Indicates that the impact differs statistically from zero at the 0.10 level.

	Number of Times to Principal's Office		Number of Times Cheated on Test		Percentage Difference in the Likelihood of Smoking	
	Net Impact	Follow-up Control Mean	Net Impact	Follow-up Control Mean	Net Impact	Follow-up Control Mean
Overall	.15	2.58	-.01	.35	-19.7%	17.2%
Gender						
Male	.62	2.66	-.04	.39	-24.5%	18.1%
Female	-.65	2.43	.05	.27	-9.9	15.8
Race/Gender						
Minority Male	.98	2.00	-.08	.41	29.9%	9.7%
Minority Female	-.47	2.37	-.05	.32	-1.9	11.9
White Male	.15	3.53	-.01	.37	-47.9*	28.2
White Female	-.94	2.58	.20	.18	-14.7	22.7

Table B.2 Net Impact of Participation in BBBS on Academic Outcomes

	Number of Visits to a College		Number of Books Read		Number of Trips to the Library	
	Net Impact	Follow-up Control Mean	Net Impact	Follow-up Control Mean	Net Impact	Follow-up Control Mean
Overall	.10	0.94	.79	4.96	-.06	5.95
Gender						
Male	.00	1.14	.77	3.71	-.23	6.10
Female	.28	.62	.81	7.01	.22	5.70
Race/Gender						
Minority Male	.26	1.33	.14	3.48	-1.01	6.20
Minority Female	-.16	.68	1.82	4.53	-1.33	5.51
White Male	-.27	.91	1.73	4.03	.77	6.03
White Female	.87	.53	-1.00	11.25	2.51	6.07

Note: The size of the analysis sample was 959: 217 minority girls, 142 white girls, 326 minority boys, 271 white boys, and 3 youth who did not give their race.
Note: No impacts differed statistically from zero at the 0.10 level.

Table B.3 Net Impact of Participation in BBBS on Relationship Inequality

	Inequality	
	Net Impact	Follow-up Control Mean
Overall	.27	12.02
Gender		
Male	.32	11.78
Female	.19	12.42
Race/Gender		
Minority Male	.15	11.67
Minority Female	.11	12.41
White Male	.57	11.93
White Female	.35	12.45

Note: The size of the analysis sample was 959: 217 minority girls, 142 white girls, 326 minority boys, 271 white boys, and 3 youth who did not give their race.
Note: No impacts differed statistically from zero at the 0.10 level.

Table B.4 Net Impact of Participation in BBBS on Social and Cultural Enrichment Outcomes

	Weekly Hours in Sport or Recreation Programs		Weekly Hours Doing Volunteer or Community Service		Weekly Hours Taking Art, Music or Dance Lessons	
	Net Impact	Follow-up Control Mean	Net Impact	Follow-up Control Mean	Net Impact	Follow-up Control Mean
Overall	.21	2.65	.14	.36	-.01	0.37
Gender						
Male	-.08	3.37	.09	.32	-.01	0.29
Female	.69	1.46	.23	.42	-.02	0.49
Race/Gender						
Minority Male	.29	3.29	.21	.28	.00	0.30
Minority Female	.48	1.59	.18	.48	-.09	0.58
White Male	-.52	3.47	-.07	.37	-.01	0.29
White Female	.94	1.27	.30	.32	.09	0.34

	Number of Times Attended a Play		Number of Times Attended a Professional Dance Performance		Number of Times Attended a Music Concert	
	Net Impact	Follow-up Control Mean	Net Impact	Follow-up Control Mean	Net Impact	Follow-up Control Mean
Overall	-.05	.99	.03	.17	.01	0.64
Gender	##					
Male	-.26*	1.05	.04	.14	.07	0.57
Female	.30	.89	.01	.22	-.09	0.75
Race/Gender						
Minority Male	-.28	1.14	.00	.20	.08	0.61
Minority Female	.31	.89	.03	.22	-.12	0.74
White Male	-.26	.94	.07	.07	.05	0.53
White Female	.24	.89	-.03	.23	-.08	0.79

Note: The size of the analysis sample was 959: 217 minority girls, 142 white girls, 326 minority boys, 271 white boys, and 3 youth who did not give their race.
** Indicates that the impact differs statistically from zero at the 0.05 level.
* Indicates that the impact differs statistically from zero at the 0.10 level.
Indicates that the impact was not the same across subgroups at a 0.05 level of significance.

	Weekly Hours Participating in School Clubs or Organizations		Weekly Hours in Youth Groups		Number of Times Attended Sporting Event	
	Net Impact	Follow-up Control Mean	Net Impact	Follow-up Control Mean	Net Impact	Follow-up Control Mean
Overall	-.15	0.87	.07	0.79	.24	1.61
Gender					##	
Male	-.25*	0.82	.06	0.67	.54**	1.77
Female	.02	0.95	.09	0.99	-.26	1.35
Race/Gender						
Minority Male	-.29	0.80	-.07	0.75	.76**	1.41
Minority Female	.09	1.00	-.04	1.17	-.45	1.35
White Male	-.19	0.85	.22	0.58	.20	2.24
White Female	-.09	0.89	.26	0.71	.09	1.30

	Number of Times Participated in An Outdoor Activity		Number of Times Visited a Museum	
	Net Impact	Follow-up Control Mean	Net Impact	Follow-up Control Mean
Overall	-.51*	2.24	.07	.92
Gender				
Male	-.66*	2.66	.08	.93
Female	-.27	1.53	.05	.89
Race/Gender				
Minority Male	-.18	1.32	.03	.93
Minority Female	-.33	.77	-.01	.86
White Male	-1.29**	4.38	.16	.94
White Female		2.82	.11	.97

Table B.5 Volunteer Screening Procedures by Agency

Volunteer Requirements	Columbus	Houston	Minneapolis	Rochester	Philadelphia	Phoenix	San Antonio	Wichita
Access to car	No	Yes	No	No	No	Yes	Yes	Yes
Personal references	3	3	3-4	3	3	4	3	4
Telephone	No	No	No	Yes	No	No	Yes	No
Psychological testing	No	Yes	Yes	No	No	Yes	Yes	No
Police check	Yes	Yes	Yes	Yes	Yes	Yes[b]	Yes	Yes
Child abuse check	No	No	No	Yes	Yes	Yes[b]	Yes	Yes
Fingerprint check	Yes	No	No	No	No	Yes	No	No
Live within specific commuting time of client	No	30 minutes	15-20 minutes	No	No	No	No	No
Home visit by agency staff	Yes	No	No	No	Yes[a]	Yes	Yes	Yes
DMV check	Yes	Yes	Yes	No	No	Yes	Yes	Yes
Minimum age	19	19	19	18	18	20	18	18
Residency requirement	No	6 months	6 months	No	No	3 months	3 months	No
Volunteer choice selecting client[c]	No	No	No	3-5	No	2	No	2-3
Number of hours training or orientation	None	2 hours	9-10 hours	5 hours	3 hours	3 hours	4 hours	Not mandatory

[a] A volunteer might have conducted the home visit.
[b] Private investigator performed these checks.
[c] Volunteers always had the opportunity to reject a client.

Table B.6 Match-Related Information by Agency

	Columbus	Houston	Minneapolis	Rochester	Philadelphia	Phoenix	San Antonio	Wichita
Parent Orientation (Group or In-person)	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Client Orientation (Group or In-person)	Yes	Yes[a]	Yes	No	Yes[a]	No	Yes	Yes
Average Time From Initial Contact to Match (months)								
Minority Little Brother	30	12-18	17	12-18	16	17[b]	18	--*
White Little Brother	24	12-18	16	6-12	10	17[b]	18	--*
Minority Little Sister	20	3-6	10	6-12	5	6[c]	5	--*
White Little Sister	6	3-6	9	3-6	3	6[c]	5	--*
Selection Interview								
Parent	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Client	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Parents Rejecting Volunteer	1%	1%	10%	1%	2%	5%	5%	1%

[a] Sexual abuse prevention.
[b] Average wait for boys. The agency did not differentiate average wait by race.
[c] Average wait for girls. The agency did not differentiate average wait by race.
* This information was unavailable.

Appendix Endnotes

1 Scale values were calculated by summing answers to individual items.

2 P/PV's experience with this scale suggested that children have difficulty with the response format in self-administered questionnaires, but have no such problem when the items are read to them.

3 Alpha is the proportion of a scale's total variance attributable to a common source.

4 Refusals include both youth who refused and parents who refused to allow their child to participate.

5 Ibid.

6 This model is a more robust specification than one that analyzes changes in outcomes. An analysis of change scores assumes that the amount of change and baseline level of the outcome measure are perfectly related. If that assumption is violated, an analysis of change scores is a misspecification of the model and the resulting estimates of the coefficients are incorrect. The model estimate for the analysis reported here controls for baseline level if this assumption is violated, and is equivalent to the change score model if this assumption holds.

7 One gender/race group category—white boys—is omitted.

8 These are calculated as appropriately valued linear combination of treatment and treatment-interaction coefficients. For example, the estimated impact on subgroup GR_1 is: $b_3 + c_1(1) + c_2(0) + c_3(0)$.

9 See Amemiya (1981) for details about the problems involved in estimation with dichotomous variables.

P/PV

Public/Private Ventures

One Commerce Square
2005 Market Street, Suite 900
Philadelphia, PA 19103

Tel: 215-557-4400
Fax: 215-557 4469
Url: http://www.ppv.org