

Natural Mentoring Relationships and Adolescent Health: Evidence From a National Study

| David L. DuBois, PhD, and Naida Silverthorn, PhD

Recently, mentoring of youth has received a great deal of attention in terms of both public awareness and government initiatives.^{1,2} Mentoring relationships may foster positive development and health among young people through several mechanisms, including the provision of social support, role modeling, opportunities to develop new skills, and advocacy.³⁻⁶ Nonparent adults who function as mentors may serve as crucial educators and support figures, promoting learning and competence, providing exposure to positive social norms, increasing a sense of efficacy and mattering, and helping youth realize their full potential.^{3,5,6} Formal mentoring programs currently are very popular; the National Mentoring Database, for example, lists more than 4500 organizations that support mentoring activities.⁷

A recent meta-analysis found evidence of a significant but small overall positive effect of mentoring programs on the emotional, behavioral, and educational functioning of participating youth (Cohen $d=.14$).⁸ Other recent reviews of the literature have reached similar conclusions.^{9,10} Many youth, however, experience natural mentoring relationships outside of formal programs with persons such as extended family members, neighbors, teachers, and coaches.¹¹⁻²⁰ In a recent survey of a nationally representative sample of adults, these types of naturally occurring ties accounted for approximately two-thirds (69%) of all reported mentoring relationships with youth.²¹ Several considerations indicate a significant potential for natural mentoring relationships to promote positive outcomes.

These relationships, for example, typically occur within a young person's existing social network. Consequently, they may have beneficial linkages to other relationships in the youth's network and may be maintained over a significant portion of the youth's development. Many natural mentors, furthermore, have important roles in contexts and activities

Objectives. We used nationally representative data to examine the impact of natural (or informal) mentoring relationships on health-related outcomes among older adolescents and young adults.

Methods. We examined outcomes from Wave III of the National Longitudinal Study of Adolescent Health as a function of whether or not respondents reported a mentoring relationship. Logistic regression was used with control for demographic variables, previous level of functioning, and individual and environmental risk.

Results. Respondents who reported a mentoring relationship were more likely to exhibit favorable outcomes relating to education/work (completing high school, college attendance, working ≥ 10 hours a week), reduced problem behavior (gang membership, hurting others in physical fights, risk taking), psychological well-being (heightened self-esteem, life satisfaction), and health (physical activity level, birth control use). However, effects of exposure to individual and environmental risk factors generally were larger in magnitude than protective effects associated with mentoring.

Conclusions. These findings suggest a broad and multifaceted impact of mentoring relationships on adolescent health. However, mentoring relationships alone are not enough to meet the needs of at-risk youths and therefore should be incorporated into more comprehensive interventions. (*Am J Public Health*. 2005; 95:518-524. doi:10.2105/AJPH.2003.031476)

that are salient in the lives of youth (e.g., school, athletics). This may increase these mentors' accessibility and value as sources of support, and encourage the young person's bonding with larger groups and institutions in ways that promote favorable health outcomes.²²

Existing investigations suggest positive benefits of natural mentoring relationships on a range of health-related outcomes for youth.^{12,15,17,18,20,23} To date, however, such studies have been limited to relatively small and potentially nonrepresentative samples. Investigations also have focused primarily on younger adolescents. Older adolescents undergoing the transition to adulthood face unique challenges, including those relating to identity development and increased independence in negotiating demands in educational, work, and interpersonal domains, any of which, if not handled successfully, may impact negatively on health-related outcomes. Supportive mentoring relationships with nonparent adults during this period thus have the potential to make a key contribution to pro-

moting outcomes important to public health goals and objectives.

The impact of natural mentors on youth experiencing individual or environmental risk factors is a further concern that has received little systematic evaluation.²⁰ Research on formal mentoring programs suggests that the benefits of mentoring may vary depending on whether youth can be considered vulnerable because of individual or environmental risk.⁸ It is important, however, to investigate whether interactions with risk status also are evident for youth experiencing natural mentoring relationships.

We had 2 major goals with the present study. First, we sought to investigate the impact of natural mentoring relationships on a wide range of outcomes in several domains (i.e., education/work, problem behavior, psychological well-being, physical health). Second, we sought to examine whether the impact of natural mentoring relationships varies with exposure to either individual or environmental risk factors.

METHODS

We drew data for the present research from the Wave I and III public-use data sets of the National Longitudinal Study of Adolescent Health (Add Health).^{24,25} The Wave III public-use data set contains 4882 respondents selected randomly from the larger restricted-use sample ($n=15\,197$). Add Health was based on a stratified random sample representing high schools across the United States.^{26–28} Youth from a representative sample along with several special samples completed Wave I in-home interviews in 1995 ($n=20\,780$) and Wave III interviews in 2001/2002 ($n=15\,197$). In-home interviews were administered using a computer-assisted personal interview, with an audio computer-assisted self-interview for sensitive questionnaire content such as substance abuse and sexual behavior.

Data collection for Add Health was based on a cluster sample with unequal probability sampling of the clusters, resulting in a sample in which observations are not independent and are not equally distributed.²⁸ To correct for design effects and unequal selection probability, procedures have been developed to ensure that unbiased parameters are obtained.^{27,28} Analyses in the present study were limited to respondents who gave valid responses to the mentoring item and had data for all covariates (see Measures section). Analyses were further limited to respondents for whom sampling weights were available ($n=3187$). However, corrections for design effects and unequal selection probability do not address potential bias attributable to other sources, specifically (1) sample attrition from Wave I to Wave III and (2) exclusion of participants with missing data on study measures.

Measures

Mentoring. Respondents having a mentoring relationship were identified with the following Wave III item: “Other than your parents or step-parents, has an adult made an important positive difference in your life at any time since you were 14 years old?” Several additional items asked about features of the relationship, including the mentor’s role (e.g., sibling, teacher) and the relationship’s

duration. Respondents who identified a younger sibling (i.e., “younger brother” or “younger sister”), “spouse or partner,” or “friend” as a mentor were excluded from the present study. These choices were excluded because it was possible that the individuals nominated in the various categories would not be older than the respondent, which is a commonly accepted part of most definitions of a mentor.⁷

Covariates. Covariates included demographic characteristics and indicators of individual and environmental risk. Demographic characteristics assessed were gender, age, and race/ethnicity. The sample for the present study comprised 1470 (46.1%) males and 1717 (53.9%) females. Respondents ranged in age from 18 to 26 years at Wave III (mean = 21.4; SD = 1.6). Race/ethnicity was coded using the following categories: White ($n=2148$; 67.4%), Hispanic ($n=356$; 11.2%), African American ($n=763$; 23.9%), Native American ($n=126$; 3.9%), Asian American ($n=126$; 3.9%), and Other ($n=200$; 6.3%).

Individual risk was coded as present if the respondent reported 1 or more of the following at Wave I: counseling or substance abuse treatment in the past year, suspension from school, failing a grade, or a physical disability. A total of 1408 respondents (44.2%) met criteria for individual risk.

Environmental risk was coded as present if respondents reported 2 or more of the following at Wave I: parent receiving public assistance, not living in a 2-parent family, no parent with a high school diploma, no parent working full time, having 3 or more siblings living at home, not feeling safe in the neighborhood (assessed by a single yes/no item), and relatively low levels of peer, family, or school connectedness (for each type of connectedness, a score below the sample median for the average of relevant survey items). A total of 1262 respondents (39.6%) met criteria for environmental risk.

Outcomes. Outcomes were assessed using Wave III measures, with corresponding Wave I indices utilized when available to control for initial levels of functioning. Education and work outcomes included completion of high school, college attendance, and working 10 or more hours per week (all coded as yes/no). The Wave I control for the 2 education out-

comes was average grade across 4 course areas (math, language arts, science, social studies). The work-related outcome had no Wave I control.

Problem behavior outcomes included binge drinking in the previous 12 months (yes/no), drug use within the previous month (yes/no), smoking within the previous month (yes/no), belonging to a gang (yes/no), injuring another person in a fight in the previous year (yes/no), and a tendency toward risk-taking (above or below the median on a scale comprising 5 items). Wave I control variables included frequency of binge drinking in the previous year, frequency of drug use in the past month, having tried smoking, frequency of delinquent behavior (aggregate of items assessing violent and nonviolent delinquency), and frequency of injuring another person in a fight during the previous year, respectively. No Wave I control was included for risk-taking.

Psychological well-being outcomes included self-esteem, life satisfaction, depressive symptoms, and suicidal ideation. Self-esteem, depressive symptoms, and suicidal ideation were measured at both Wave I and Wave III. Life satisfaction had no corresponding Wave I control. Self-esteem was measured as the average of 4 items representing global feelings of self-worth. Life satisfaction was measured using a 5-point scale from very dissatisfied to very satisfied. Depressive symptoms were measured using the average of 9 items from the Center for Epidemiologic Studies Depression Scale.²⁹ Suicidal ideation was assessed as the presence (yes/no) of suicidal thoughts in the previous year. Wave III self-esteem and life satisfaction scores were dichotomized as high or low (i.e., above or below the sample median). Depressive symptoms were dichotomized as high or low based on a cutpoint corresponding to an average rating of 1 on the 3-point response scale for these items.

Physical health outcomes included perceived general health, physical activity level, diagnosis of a sexually transmitted disease (STD), and regular use of birth control and condoms. Perceived general health was rated at both Wave I and Wave III on a 5-point scale from poor to excellent. Physical activity level at both Wave I and Wave III was assessed as the mean of responses to multiple

TABLE 1—Mentoring as Predictor of Educational and Work Outcomes

Outcome	Mentoring		Individual Risk		Environmental Risk		Wave I Control ^a
	OR (95% CI)	PAR ^b	OR (95% CI)	PAR	OR (95% CI)	PAR	OR (95% CI)
Completed high school ^c	1.53** (1.11, 2.13)	0.11	0.32*** (0.22, 0.47)	0.46	0.60*** (0.45, 0.81)	0.19	2.66*** (2.19, 3.32)
Attend college ^c	1.65*** (1.28, 2.11)	0.07	0.70*** (0.58, 0.83)	0.09	0.58*** (0.47, 0.72)	0.12	3.31*** (2.82, 3.90)
Work 10 or more hours per week ^{c,d}	1.38** (1.12, 1.72)	0.08	0.50*** (0.39, 0.65)	0.26	0.80 (0.62, 1.02)	0.08

Note. OR=odds ratio; CI = confidence interval; PAR = population attributable risk. All analyses include statistical control for demographic variables of gender, age, and race/ethnicity.

^aWave I control for completed high school is average grade. There is no corresponding Wave I control variable for working 10 or more hours per week.

^bTo enable comparison across predictors, PAR values for mentoring were computed with the mentoring predictor recoded so that a score of 1 represented not reporting a mentoring relationship.

^cFor calculation of PAR values, these outcomes were expressed in negative terms (e.g., not completed high school).

^dAnalysis limited to respondents not currently enrolled in postsecondary education.

* $P < .05$; ** $P < .01$; *** $P < .001$.

items indicating the frequency of participation in physical activities during the previous week. Wave III scores for general health and physical activity level were dichotomized using a median split. STD diagnosis reflected whether respondents reported having been treated for an STD in the previous year at Wave III. Regular birth control and condom use were measured as whether respondents indicated at Wave III that they or their partners had used birth control or condoms in most or all of their sexual encounters during the previous year. The control for the 3 sexual health outcomes was whether respondents reported having been sexually active at Wave I.

Analysis

Logistic regression analyses were conducted to examine whether reporting a mentoring relationship predicted each outcome when controlling for demographic characteristics, individual and environmental risk, and indices of Wave I functioning (when available). Interactions also were tested between mentoring and risk (i.e., mentor \times environmental risk, mentor \times individual risk, and mentor \times environmental risk \times individual risk) to investigate whether having a mentoring relationship varied as a predictor of outcomes in association with either or both types of risk. Only significant interaction results are reported. Sampling weights and study design effects were incorporated in the calculation of logistic regression estimates using the GENMOD procedure of SAS (SAS Institute Inc, Cary, NC).²⁶

Population attributable risk (PAR) values were calculated for mentoring and individual

and environmental risk in analyses where mentoring was a significant predictor.³⁰ These values enabled us to examine the relative potential influence of each predictor on outcomes and were computed based on estimates of relative risk that were adjusted for all covariates.³¹

As noted, certain outcome measures (e.g., self-esteem) were measured on a continuous scale, but were dichotomized for purposes of the present investigation. This allowed for consistency with other outcomes that already were dichotomous in nature (e.g., having completed high school), thereby facilitating interpretation of the relative impact of mentoring as a predictor of different outcomes. Supplementary analyses using multiple regression investigated whether findings differed when relevant measures were maintained in their original continuous form. Findings were highly similar to those obtained in primary study analyses, such that having a mentor was a significant predictor of the same outcomes, and the same interactions reached or approached significance. However, when using a continuous measure of depressive symptoms, follow-up analysis of the mentor \times individual risk \times environmental risk interaction failed to reveal having a mentor as a significant predictor of this outcome for any risk subgroup.

RESULTS

Characteristics of Mentoring Relationships

Approximately three-quarters of the sample ($n = 2323$; 72.9%) reported having had a mentor. Mentoring relationships ranged in du-

ration from 1 to 26 years (mean = 9.1; SD = 7.1). More than 40% of mentors were family members (older brother = 8.0%; older sister = 8.0%; grandmother = 8.7%; grandfather = 4.0%; aunt = 7.8%; uncle = 5.6%). Approximately one-quarter (26.0%) of mentors were teachers or guidance counselors. Other mentors included coaches (5.6%); religious leaders such as ministers, priests, and rabbis (5.1%); employers (4.1%); coworkers (4.4%); neighbors (1.3%); friends' parents (4.8%); doctors or therapists (0.5%); and others (5.9%).

Logistic Regression Analyses

Education and work. Results of logistic regression analyses predicting education and work outcomes are presented in Table 1. Having a natural mentor was associated with a greater likelihood of having completed high school and attended college. The analysis for the work outcome was limited to participants not attending college at Wave III. Youth reporting a mentoring relationship were significantly more likely to be working 10 or more hours a week.

Problem behavior. Table 2 presents results for problem behavior outcomes. Mentoring was associated with a significantly decreased likelihood of being a gang member, hurting someone in a fight during the previous year, and risk taking. The mentor \times environmental risk interaction was significant for hurting another person in a fight. Further examination indicated that the effect of mentoring for this outcome was nonsignificant for youth without environmental risk, but was significant for

TABLE 2—Mentoring as Predictor of Problem Behavior Outcomes

Outcome	Mentoring		Individual Risk		Environmental Risk		Wave I Control ^a
	OR (95% CI)	PAR ^b	OR (95% CI)	PAR	OR (95% CI)	PAR	OR (95% CI)
Binge drinking	1.11 (0.82, 1.51)	...	0.78 (0.61, 1.01)	...	0.89 (0.67, 1.19)	...	1.25*** (1.15, 1.35)
Drug use	0.98 (0.76, 1.25)	...	1.46*** (1.17, 1.82)	...	1.09 (0.88, 1.34)	...	1.04*** (1.02, 1.06)
Smoking	1.22 (0.94, 1.57)	...	1.40** (1.10, 1.78)	...	1.07 (0.88, 1.29)	...	5.97*** (4.73, 7.54)
Gang membership	0.80* (0.64, 0.99)	0.06	1.25 (0.97, 1.60)	0.09	1.13 (0.87, 1.46)	0.04	1.07 (0.78, 1.48)
Hurt other in fight	0.71* (0.51, 0.98)	0.10	1.73** (1.21, 2.48)	0.23	1.43* (1.00, 2.05)	0.14	1.36** (1.08, 1.70)
Risk-taking	0.82* (0.69, 0.99)	0.04	1.05 (0.90, 1.22)	-0.01	1.04 (0.89, 1.23)	0.01	...

Note. OR = odds ratio; CI = confidence interval; PAR = population attributable risk. All analyses include statistical control for demographic variables of gender, age, and race/ethnicity.

^aWave I control for binge drinking is frequency of binge drinking in the previous year; for drug use, the control is frequency of drug use in the past month; for smoking, the control is having tried smoking (yes/no); for gang membership, the control is average frequency of delinquent behavior; for hurt others in fight, the control is number of times respondent injured another person in a fight in the previous year. There is no corresponding Wave I control variable for risk-taking.

^bPAR values are included only for outcomes where mentoring is a significant predictor. To enable comparison across predictors, PAR values for mentoring were computed with the mentoring predictor recoded so that a score of 1 represented not reporting a mentoring relationship.

P*<.05; *P*<.01; ****P*<.001.

youth with environmental risk (odds ratio [OR]=0.47; 95% confidence interval (CI)=0.29, 0.76; *P*<.01).

Psychological well-being. Results for psychological well-being outcomes are shown in Table 3. Having a mentor was associated with a greater likelihood of reporting relatively high levels of self-esteem and life satisfaction. There was a significant mentor × individual risk × environmental risk interaction for depressive symptoms. Further examination indicated that the effect of having a mentor for this outcome was significant only for youth without individual or environmental risk (OR=1.76; 95% CI=1.07, 2.89; *P*<.05), with this finding in the unexpected direction of mentoring predicting relatively higher reported levels of depressive symptoms.

Physical health. Table 4 presents results for the physical health outcomes. Having a mentor was associated with a greater likelihood of reporting a relatively high level of physical activity as well as regular use of birth control. There was a significant mentor × individual risk × environmental risk interaction for physical activity level. Further examination revealed that the effect of having a mentor for this outcome was significant for youth without individual or environmental risk (OR=1.61; 95% CI=1.19, 2.19; *P*<.01) and for youth with both individual and environmental risk (OR=1.50; 95% CI=1.01, 2.22; *P*<.05), but was nonsignificant for youth with only individual or only environmental risk. Finally, the mentor × environmental risk interaction was significant for STD diagnosis. However,

further examination indicated that the effect of mentoring for this outcome was nonsignificant for youth both with and without environmental risk.

DISCUSSION

Several features of the current study are noteworthy. First, the study was based on a nationally representative sample of older adolescents and young adults (aged 18–26 years at follow-up) participating in the Add Health study. Second, natural mentoring relationships were investigated as predictors of outcomes during late adolescence and early adulthood, thus addressing their role in promoting health among older youth than have been included in most prior studies. Finally, data from an

TABLE 3—Mentoring as Predictor of Psychological Well-Being Outcomes

Outcome	Mentoring		Individual Risk		Environmental Risk		Wave I Control ^a
	OR (95% CI)	PAR ^b	OR (95% CI)	PAR	OR (95% CI)	PAR	OR (95% CI)
Self-esteem ^c	1.23* (1.01, 1.50)	0.03	0.86 (0.72, 1.02)	0.04	0.91 (0.76, 1.10)	0.02	2.25*** (1.93, 2.63)
Life satisfaction ^c	1.31* (1.05, 1.64)	0.04	0.63** (0.48, 0.83)	0.15	0.50*** (0.40, 0.63)	0.24	...
Depressive symptoms	1.17 (0.87, 1.56)	...	1.63*** (1.29, 2.06)	...	1.48* (1.17, 1.88)	...	3.92*** (2.98, 5.14)
Suicidal ideation	1.08 (0.73, 1.59)	...	1.05 (0.75, 1.47)	...	1.59** (1.14, 2.21)	...	5.53*** (1.64, 5.14)

Note. OR = odds ratio; CI = confidence interval; PAR = population attributable risk. All analyses include statistical control for demographic variables of gender, age, and race/ethnicity.

^aWave I control for self-esteem is self-esteem scale score; for depressive symptoms, the control is average frequency of depressive symptoms; for suicidal ideation, the control is experience of suicidal ideation in the previous year (yes/no). There is no corresponding Wave I control variable for life satisfaction.

^bPAR values are included only for outcomes where mentoring is a significant predictor. To enable comparison across predictors, PAR values for mentoring were computed with the mentoring predictor recoded so that a score of 1 represented not reporting a mentoring relationship.

^cFor calculation of PAR values, these outcomes were expressed in negative terms (e.g., low self-esteem).

P*<.05; *P*<.01; ****P*<.001.

TABLE 4—Mentoring as Predictor of Physical Health Outcomes

Outcome	Mentoring		Individual Risk		Environmental Risk		Wave I Control ^a
	OR (95% CI)	PAR ^b	OR (95% CI)	PAR	OR (95% CI)	PAR	OR (5% CI)
General health	0.98 (0.77, 1.25)	...	0.79* (0.65, 0.96)	...	0.79* (0.64, 0.98)	...	2.15*** (1.90, 2.45)
Physical activity level ^c	1.42*** (1.16, 1.74)	0.05	0.96 (0.81, 1.13)	0.01	0.73** (0.60, 0.89)	0.07	1.59*** (1.39, 1.82)
STD diagnosis	1.07 (0.71, 1.63)	...	1.19 (0.82, 1.71)	...	1.10 (0.76, 1.58)	...	2.57*** (1.78, 3.72)
Birth control use ^{c,d}	1.40** (1.12, 1.76)	0.07	0.66*** (0.53, 0.81)	0.14	0.82 (0.64, 1.04)	0.06	0.78* (0.63, 0.96)
Condom use ^d	1.23 (0.96, 1.56)	...	0.86 (0.71, 1.04)	...	0.77* (0.61, 0.98)	...	0.74** (0.59, 0.92)

Note. OR = odds ratio; CI = confidence interval; PAR = population attributable risk; STD = sexually transmitted disease. All analyses include statistical control for demographic variables of gender, age, and race/ethnicity.

^aWave I control for general health is self-rated general health; for physical activity level, the control is average physical activity level; for STD diagnosis, birth control use, and condom use, control is whether respondent reported having had sexual intercourse at a time point prior to Wave I.

^bPAR values are included only for outcomes where mentoring is a significant predictor. To enable comparison across predictors, PAR values for mentoring were computed with the mentoring predictor recoded so that a score of 1 represented not reporting a mentoring relationship.

^cFor calculation of PAR values, these outcomes were expressed in negative terms (e.g., low physical activity level).

^dAnalysis limited to respondents who were sexually active during the year prior to the Wave III assessment.

* $P < .05$; ** $P < .01$; *** $P < .001$.

earlier time point in the Add Health study (approximately 6 years prior) were available for most outcome measures, thus enabling statistical control for the contribution of earlier levels of functioning.

The results of the current study are consistent with the view that mentoring relationships facilitate positive gains in the health and well-being of developing youth. Similar findings have been reported in previous research.^{12,15,17,18,20,23} Methodologically, however, those studies were not based on large, nationally representative samples and typically did not include statistical control for either risk factors or earlier levels of functioning.

Youth who reported a natural mentoring relationship were more likely to exhibit favorable outcomes in the areas of education/work (i.e., completing high school, college attendance, working ≥ 10 hours a week), problem behavior (i.e., reduced risk of gang membership and hurting others in physical fights and decreased risk taking), psychological well-being (i.e., heightened self-esteem and life satisfaction), and physical health (i.e., greater physical activity level, birth control use). These findings suggest a broad and multifaceted impact of mentoring relationships on adolescent health and well-being.

Longevity appears to be an important factor underlying beneficial mentoring relationships.^{10,32–34} It is noteworthy, therefore, that the mentoring relationships reported by participants in the present study were often of

long duration (9.1 years on average). Long-term ties provide opportunities for stronger and more influential bonds to develop between mentors and youth.⁷ Furthermore, the types of adults identified as mentors in the current study often are important figures in the day-to-day lives of youth—more than 40% of identified mentors were extended family members, and approximately one-fourth were teachers or guidance counselors. Family and school are both primary contexts for adolescent development. Mentoring ties that are linked to these settings thus may be especially well suited to promoting positive outcomes.

However, mentoring relationships were not indicated to have beneficial effects on all outcomes examined in the current study. Favorable effects of mentoring were evident for all but 2 of 9 positive outcomes (general health, condom use), but were not apparent for 6 of the 9 negative outcomes (binge drinking, drug use, smoking, depressive symptoms, suicidal ideation, STD diagnosis). In accordance with this trend, Rhodes recently proposed a model that specifically emphasizes the role of mentoring in promoting positive developmental outcomes during adolescence such as emotional well-being, social competence, and academic achievement.⁷

There also are potential barriers to the capacity of mentors to decrease risk for various negative youth outcomes. In the present research, natural mentoring was not found to

be related to reduction in risk for any of the types of substance use examined (binge drinking, drug use, smoking). Evidence of benefits for mentoring in this area has been mixed in other research as well.^{12,35} Mentoring by significant adults (e.g., parents) is an important factor in preventing substance use.^{36,37} Mentors, in comparison, are not likely to be able to provide a high level of monitoring if they have only periodic contact with youth. In addition, mentors may inadvertently model behaviors such as alcohol consumption or smoking.³⁸ Finally, some forms of substance use may be perceived as normative by older adolescents and young adults (e.g., binge drinking among college students³⁹) and may therefore be especially difficult to deter through mentoring.

Mentoring and At-Risk Youth

Our findings generally failed to reveal significant variation in the benefits of natural mentoring relationships as a function of individual or environmental risk. The interactions found, furthermore, were not consistent in pattern and may reflect chance findings owing to the large sample size and number of tests of significance. In comparison, formal mentoring programs have been found to have stronger effects when they served youth who were experiencing either both individual and environmental risk, or environmental risk alone, compared to when they were serving youth who were not experiencing ei-

ther type of risk.⁸ This could be attributable in part to the fact that many programs are designed to meet the needs of specific at-risk populations. Natural mentoring relationships, because of their inherent greater flexibility, may be better suited to providing benefits that extend equally to youth not identified as at-risk.

The favorable overall effects on many outcomes that are evident for natural mentoring relationships do indicate a capacity for these ties to help offset negative effects of individual and environmental risk on the same outcomes. However, estimates of PAR associated with whether the respondent reported having a mentor were fairly small in absolute magnitude (3%–11%), and in most instances were less than those associated with individual or environmental risk. The benefits of having a mentor thus were not strong enough to fully compensate for the effects of risk.

Because there was conceptual overlap between certain indicators of risk status (e.g., failing a grade) and outcomes (e.g., completing high school), PAR estimates may have been inflated for individual and environmental risk. Overall, however, our findings are consistent with the view that it may be unrealistic to expect mentors alone to undo cumulative effects of multiple sources of risk.⁷ Research on resilience suggests that successful outcomes depend on a broad range of other factors, including skills in communication and problem solving, quality of ties with primary caregivers, and access to relevant opportunities and resources within the community.⁴⁰

Relative to prior research, a greater proportion of youth in this sample reported having a natural mentor.^{15,20} Factors contributing to this difference may include the extended time frame that respondents were asked to consider as well as the wide range of familial and nonfamilial ties incorporated into the study's operationalization of mentoring. Previous studies, for example, typically have not considered older siblings as potential natural mentors. Variations in these and other aspects of how natural mentoring relationships are defined may have implications for the associations observed between mentoring ties and outcomes, and should receive systematic investigation in future work.

Applied Implications and Directions for Future Research

The findings of the current study indicate that natural mentoring relationships contribute to the health and well-being of youth from a diverse range of backgrounds. Health promotion and prevention programs thus may benefit from the use of strategies to cultivate ties between youth and adults who have the potential to serve as effective natural mentors. The frequency with which extended family members and school personnel were nominated as mentors in the present sample suggests their promise as targets for intervention. Systematic comparison of outcomes associated with these and other categories of natural mentors should be undertaken in future research to clarify this issue.

For interventions to be optimally effective, specific relationship characteristics and processes (e.g., closeness of the relationship, longer duration) that promote positive health-related outcomes also need to be identified.⁴ Further research in these directions may expand the range of outcomes for which mentoring relationships are indicated to be beneficial. We will address this possibility in a follow-up investigation with the present data set.

It seems clear that, even under ideal circumstances, mentoring alone will not likely be sufficient to fully address the needs of at-risk youth. Taking all of these considerations into account, the cultivation of mentoring relationships within comprehensive, multifaceted interventions offers the greatest promise.^{41,42} Programs and policies that utilize mentoring ties to enhance the delivery and implementation of strategies that target other well-established risk and protective factors is a promising direction that should be pursued.⁴³ ■

About the Authors

David L. DuBois and Naida Silverthorn are with the Community Health Sciences Division, School of Public Health, University of Illinois at Chicago.

Requests for reprints should be sent to David L. DuBois, PhD, Community Health Sciences Division, School of Public Health (MC 923), University of Illinois at Chicago, 1603 W Taylor St, Chicago, IL 60612-4324 (e-mail: dldubois@uic.edu).

This article was accepted May 9, 2004.

Contributors

D. L. DuBois conceptualized the study. N. Silverthorn conducted the analyses and wrote the first draft of the article. Both authors revised the article.

Acknowledgments

The research described in this article was supported by William T. Grant Foundation (grant 2469). Add Health is a program project designed by J. Richard Udry (principal investigator) and Peter Bearman, and funded by the National Institute of Child Health and Human Development (NICHD) (grant P01-HD31921 to the Carolina Population Center, University of North Carolina at Chapel Hill), with cooperative funding participation by the National Cancer Institute; the National Institute on Alcohol Abuse and Alcoholism; the National Institute on Deafness and Other Communication Disorders; the National Institute on Drug Abuse; the National Institute of General Medical Sciences; the National Institute of Mental Health; the National Institute of Nursing Research; the Office of AIDS Research, National Institutes of Health (NIH); the Office of Behavior and Social Sciences Research, NIH; the Office of the Director, NIH; the Office of Research on Women's Health, NIH; the Office of Population Affairs, US Department of Health and Human Services (DHHS); the National Center for Health Statistics, Centers for Disease Control and Prevention (CDC), DHHS; the Office of Minority Health, CDC, DHHS; the Office of Minority Health, Office of Public Health and Science, DHHS; the Office of the Assistant Secretary for Planning and Evaluation, DHHS; and the National Science Foundation.

The data used in this publication were made available by the American Family Data Archive (AFDA) and the Data Archive on Adolescent Pregnancy and Pregnancy Prevention (DAAPPP), Sociometrics Corporation, Los Altos, Calif. Funding support for preparing the AFDA revised documentation was provided by the NICHD to Sociometrics Corporation (grant 2 R44-HD31776). Funding for the work done by the DAAPPP to prepare the data for public use was provided by the NICHD (contract N01-HD-9-3306 to Sociometrics Corporation).

Note. The original investigators, funding agency, AFDA, and DAAPPP are not responsible for the analyses or interpretations presented here.

Human Participant Protection

No protocol approval was needed for this study.

References

1. Grossman JB. The practice, quality and cost of mentoring. In: Grossman JB, ed. *Contemporary Issues in Mentoring*. Philadelphia, Pa: Public/Private Ventures; 1999:5–9.
2. Rhodes JE, Bogat GA, Roffman J, Edelman P, Galasso L. Youth mentoring in perspective: introduction to the special issue. *Am J Community Psychol*. 2002;30:149–155.
3. Hamilton S, Darling N. Mentors in adolescents' lives. In: Hurrellmann K, Engel U, eds. *The Social World of Adolescents: International Perspectives*. New York, NY: Aldine de Gruyter; 1989:121–139.
4. Heaney CA, Israel BA. Social networks and social support. In: Glanz K, Rimer BK, Lewis FM, eds. *Health Behavior and Health Education: Theory, Research, and Practice*. 3rd ed. San Francisco, Calif: Jossey-Bass; 2002:185–209.

5. Committee on Community-Level Programs for Youth, Eccles J, Appleton Gootman J, eds. *Community Programs to Promote Youth Development*. Washington, DC: National Academy Press; 2001.
6. Barrera M Jr, Prelow H. Interventions to promote social support in children and adolescents. In: Cicchetti D, Rappaport J, Sandler I, Weissberg RP, eds. *The Promotion of Wellness in Children and Adolescents*. Washington, DC: CWLA Press; 2000:309–339.
7. Rhodes JE. *Stand by Me: The Risks and Rewards of Mentoring Today's Youth*. Cambridge, Mass: Harvard University Press; 2002.
8. DuBois DL, Holloway BE, Valentine JC, Cooper H. Effectiveness of mentoring programs for youth: a meta-analytic review. *Am J Community Psychol*. 2002;30:157–197.
9. Hall JC. *Mentoring and Young People: A Literature Review*. Glasgow, Scotland: The SCRE Centre, University of Glasgow; 2003. SCRE Research Report 114.
10. Jekielek SM, Moore KA, Hair EC, Scarupa HJ. *Mentoring: A Promising Strategy for Youth Development* [research brief]. Washington, DC: Child Trends; February 2002.
11. Beam MR, Chen C, Greenberger E. The nature of adolescents' relationships with their "very important" nonparental adults. *Am J Community Psychol*. 2002;30:305–325.
12. Beier SR, Rosenfeld WD, Spitalny KC, Zansky SM, Bontempo AN. The potential role of an adult mentor in influencing high-risk behaviors in adolescents. *Arch Pediatr Adolesc Med*. 2000;154:327–331.
13. Chen C, Greenberger E, Farruggia S, Bush K, Dong Q. Beyond parents and peers: the role of important non-parental adults (VIPs) in adolescent development in China and the United States. *Psychol Sch*. 2003;40:35–50.
14. Hirsch BJ, Mickus M, Boerger R. Ties to influential adults among black and white adolescents: culture, social class, and family networks. *Am J Community Psychol*. 2002;30:289–303.
15. Klaw EL, Rhodes JE. Mentor relationships and the career development of pregnant and parenting African-American teenagers. *Psychol Women Q*. 1995;19:551–562.
16. Munsch J, Liang S, DeSecottier L. Natural mentors: who they are and the roles they fill. A gender and ethnic comparison. Poster presented at: Biennial Meeting of the Society for Research on Adolescence; March 1996; Boston, Mass.
17. Rhodes JE, Contreras JM, Mangelsdorf SC. Natural mentor relationships among Latina adolescent mothers: psychological adjustment, moderating processes, and the role of early parental acceptance. *Am J Community Psychol*. 1994;22:211–227.
18. Rhodes JE, Ebert L, Fischer K. Natural mentors: an overlooked resource in the social networks of young, African American mothers. *Am J Community Psychol*. 1992;20:445–461.
19. Sanchez B, Reyes O. Descriptive profile of the mentorship relationships of Latino adolescents. *J Community Psychol*. 1999;27:299–302.
20. Zimmerman MA, Bingenheimer JB, Notaro PC. Natural mentors and adolescent resiliency: a study with urban youth. *Am J Community Psychol*. 2002;30:221–243.
21. MENTOR/National Mentoring Partnership. *Mentoring in America 2002*. Alexandria, Va: MENTOR/National Mentoring Partnership; 2002. Available at: http://mentoring.web.aol.com/common/one_report/national_poll_report_final.pdf. Accessed November 29, 2004.
22. Hawkins JD, Catalano RF Jr. *Communities That Care: Action for Drug Abuse Prevention*. San Francisco, Calif: Jossey-Bass; 1992.
23. Greenberger E, Chen C, Beam MR. The role of "very important" nonparental adults in adolescent development. *J Youth Adolesc*. 1998;27:321–343.
24. Udry JR. *The National Longitudinal Study of Adolescent Health (Add Health). Waves I and II, 1994–1996. Data Sets 48–50, 98, A1–A3* [machine-readable data file and documentation]. Los Altos, Calif: American Family Data Archive, Sociometrics Corporation; 1998.
25. Udry JR. *The National Longitudinal Study of Adolescent Health (Add Health). Wave III, 2001–2002. Data Sets Q1–Q9* [machine-readable data file and documentation]. Los Altos, Calif: Data Archive on Adolescent Pregnancy and Pregnancy Prevention, Sociometrics Corporation; 2003.
26. Carolina Population Center. The National Longitudinal Study of Adolescent Health: Study Design. Available at: <http://www.cpc.unc.edu/addhealth>. Accessed November 29, 2004.
27. Chantala K. *Introduction to Analyzing Add Health Data* [user guide]. Chapel Hill: Carolina Population Center, University of North Carolina; 2003. Available at: <http://www.cpc.unc.edu/addhealth/files/analyze.pdf>. Accessed November 29, 2004.
28. Chantala K, Tabor J. *Strategies to Perform a Design-Based Analysis Using the Add Health Data* [user guide]. Chapel Hill: Carolina Population Center, University of North Carolina; 1999. Available at: <http://www.cpc.unc.edu/addhealth/files/weight1.pdf>. Accessed November 29, 2004.
29. Radloff LS. The CES-D scale: a self-report depression scale for research in the general public. *Appl Psychol Meas*. 1977;1:385–401.
30. Tu S. Developmental epidemiology: a review of three key measures of effect. *J Clin Child Adolesc Psychol*. 2003;32:187–192.
31. Zhang J, Yu KF. What's the relative risk? A method of correcting the odds ratio in cohort studies of common outcomes. *JAMA*. 1998;280:1690–1691.
32. Grossman JB, Rhodes JE. The test of time: predictors and effects of duration in youth mentoring relationships. *Am J Community Psychol*. 2002;30:199–219.
33. Klaw EL, Rhodes JE, Fitzgerald LF. Natural mentors in the lives of African American adolescent mothers: tracking relationships over time. *J Youth Adolesc*. 2003;32:223–232.
34. McLearn KT, Colasanto D, Schoen C. *Mentoring Makes a Difference: Findings From the Commonwealth Fund 1998 Survey of Adults Mentoring Young People*. New York, NY: The Commonwealth Fund; 1998.
35. Tierney JP, Grossman JB, Resch NL. *Making a Difference: An Impact Study of Big Brothers/Big Sisters*. Philadelphia, Pa: Public/Private Ventures; 1995.
36. Oxford ML, Harachi TW, Catalano RF, Abbott RD. Preadolescent predictors of substance initiation: a test of both the direct and mediated effect of family social control factors on deviant peer associations and substance initiation. *Am J Drug Alcohol Abuse*. 2001;27:599–616.
37. Webb JA, Bray JH, Getz JG, Adams G. Gender, perceived parental monitoring, and behavioral adjustment: influences on adolescent alcohol use. *Am J Orthopsychiatry*. 2002;72:392–400.
38. Beam MR, Gil-Rivas V, Greenberger E, Chen C. Adolescent problem behavior and depressed mood: risk and protection within and across social contexts. *J Youth Adolesc*. 2002;31:343–357.
39. Wechsler H, Lee JE, Kuo M, Seibring M, Nelson TF, Lee H. Trends in college binge drinking during a period of increased prevention efforts. Findings from 4 Harvard School of Public Health College Alcohol Study surveys: 1993–2001. *J Am Coll Health*. 2002;50:203–217.
40. Werner EE. Resilience in development. *Curr Dir Psychol Sci*. 1995;4:81–85.
41. Jurich S, Estes S. *Raising Academic Achievement: A Study of 20 Successful Programs*. Washington, DC: American Youth Policy Forum; 2000.
42. Flay BR. Positive youth development requires comprehensive health promotion programs. *Am J Health Behav*. 2002;26:407–424.
43. Kuperminc GP. Integration of mentoring into other programs and services. Paper presented at: 2003 National Research Summit on Mentoring; October 15–16, 2003; Kansas City, Mo.

Copyright of American Journal of Public Health is the property of American Public Health Association and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.