Characteristics of Natural Mentoring Relationships and Adolescent Adjustment: Evidence from a National Study

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This research investigated characteristics of natural mentoring relationships (mentor role, frequency of contact, closeness, duration) as predictors of adjustment outcomes among older adolescents and young adults (N = 2, 053) in the Add Health study. Outcomes were assessed in the domains of education/work, problem behavior, psychological well-being, and physical health. Mentoring relationships with persons in roles outside of the family predicted greater likelihood of favorable outcomes in all domains except psychological well-being, relative to mentoring relationships with family members. Greater reported closeness in relationships was predictive of several favorable outcomes, particularly those in the domain of psychological well-being. These findings indicate that strategies to promote mentoring of adolescents may be more effective if particular categories of adults are targeted and an effort is made to cultivate relationships with strong emotional bonds.

Editors' Strategic Implications: *These data suggest that the cultivation of natural (especially non-familial) mentoring relationships during adolescence may be a promising strategy for prevention and health promotion. This study is impressive due to its large, nationally representative sample, the examination of relationship characteristics and multiple mentors, and the links to a variety of outcomes (controlling for earlier functioning). School officials and mentoring programs must consider how to capitalize on – and promote – naturally occurring mentor relationships.*

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Youth mentoring has become increasingly popular, garnering public attention as well as governmental support (Rhodes, 2002). Mentoring programs, however, typically have had only small positive effects on the emotional, behavioral, and educational functioning of participating youth (DuBois, Holloway, Valentine, & Cooper, 2002). Similarly, although benefits also have been evident for youth reporting natural mentoring relationships, results have not been consistent across outcomes (Beier, Rosenfeld, Spitalny, Zansky, & Bontempo, 2000; DuBois & Silverthorn, in press; Greenberger, Chen, & Beam, 1998; Klaw & Rhodes, 1995; Rhodes, Contreras, & Mangelsdorf, 1994; Rhodes, Ebert, & Fischer, 1992; Zimmerman, Bingenheimer, & Notaro, 2002; for a review, see Zimmerman, Bingenheimer, & Behrendt, in press). In an investigation using the nationally-representative sample of the Add Health study, for example, respondents who reported having had a mentor during adolescence were more likely to report positive outcomes in each of several domains (i.e., education/work, problem behavior, psychological well-being, and physical health), but did not differ significantly from those not reporting mentors on several outcomes such as substance use, depression, and regular use of condoms (DuBois & Silverthorn, in press). An important consideration, however, is the potential for outcomes to be influenced by one or more characteristics of mentoring relationships and thus depend on more than just the presence of a mentor in the youth's life (DuBois, Neville, Parra, & Pugh-Lilly, 2002; Rhodes, 2002). Frameworks describing phases of intervention research (see e.g., Flay, 1986, Institute of Medicine, 1994) emphasize the need to clarify issues such as this through basic research, thereby strengthening the foundation for program development and evaluation. From this perspective, greater understanding of relationship characteristics that are associated with positive outcomes could inform the design of programs that seek to foster mentoring ties and help to identify dimensions of relationships to assess when evaluating program effectiveness. The present study investigates characteristics of mentoring relationships experienced during adolescence as predictors of a range of outcomes in the educational/occupational, psychosocial, and health domains.

Characteristics of Mentoring Relationships

Available theory and research suggest the potential importance of several characteristics of mentoring relationships. These include the mentor's role in the youth's life, frequency of contact between mentor and youth, emotional closeness in the relationship, and relationship duration (DuBois et al., 2002; DuBois et al., 2002; Rhodes, 2002). Mentor role can be conceptualized broadly as the source of the mentor in the youth's life, such as extended family, informal social network (e.g., neighbor, coach), or a more formal tie established with an educator or other helping professional (e.g., teacher, counselor). Differences in perceptions of support across these varying sources are a salient dimension of the social networks of children and adolescents and have been found to be important in the

prediction of outcomes (for a review, see Cauce, Mason, Gonzales, Hiraga, & Liu, 1996). This literature suggests that relationships with mentors in different roles and backgrounds could have unique features that either facilitate or impede their capacity to promote positive youth outcomes. Theoretically, for example, along with their potential advantages, mentoring relationships formed within the youth's family system may be more susceptible to complicating factors such as both the mentor and youth being affected by the same stressors (Heaney & Israel, 2002). Noteworthy features of relationships with individuals outside of the family system include their potential to build the youth's social capital through exposure to new networks (Darling, Hamilton, & Niego, 1994) as well as their capacity to promote competence in areas relevant to the mentor's background (Rhodes, 2002). In relevant empirical work, mentoring ties with both familial and non-familial adults have been found to be reported by significant proportions of youth (Beam, Chen, & Greenberger, 2002; DuBois & Silverthorn, in press; Klaw & Rhodes, 1995; Munsch, Liang, & DeSecottier, 1996; Sanchez & Reyes, 1999; Zimmerman et al., 2002). The implications of different mentor roles in the youth's life have not received systematic investigation. In a recent study of Boys and Girls Clubs, the perceived quality of youth relationships with staff had more powerful linkages with self-esteem and life satisfaction than the quality of relationships with closest kin (Hirsch, Roffman, Pagano, & Deutsch, 2000). Although preliminary, these findings are consistent with the view that familial and non-familial mentoring ties may differ in their associations with youth outcomes.

The frequency of contact between mentors and youth represents a potentially important influence on the extent to which theoretically relevant processes of change have the opportunity to occur in relationships, including role modeling, meaningful dialogue and conversation, and skill development (Rhodes, 2002). In accordance with this view, greater amounts of time spent together have been found to be associated with higher reported levels of emotional and instrumental support in mentoring relationships (Herrera, Sipe, & McClanahan, 2000; McLearn, Colasanto, & Schoen, 1998) as well as an increased likelihood of the youth nominating the mentor as a significant adult in his or her life (DuBois et al., 2002). A review of mentoring program evaluations (Jekielek, Moore, Hair, & Scarupa, 2002), furthermore, concluded that relationships characterized by more frequent contact were associated with more positive youth outcomes.

The degree to which feelings of closeness exist between the mentor and youth has been widely regarded as an important component of mentoring relationships (Rhodes, 2002; Greenberger, Chen, & Beam, 1998). Within a model proposed by Rhodes (2002), the development of an emotional bond characterized by mutuality and empathy is a necessary condition for mentors to have a positive influence on youth. Several studies also have found support for an association between relationship closeness and positive youth outcomes (Chen, Greenberger, Faruggia, Bush, & Dong, 2003; Greenberger et al., 1998; Hirsch, Mickus, & Boerger, 2002; Hirsch, Roffman, Pagano, & Deutsch, 2000; Parra, DuBois, Neville, Pugh-Lilly, &

Povinelli, 2002). Illustratively, studies of adults rated as "Very Important Persons" (VIPs) found that, for girls, perceived VIP warmth and acceptance was related to lower incidence of depressed mood (Greenberger et al., 1998) and that, among Chinese youth, VIP warmth was associated with greater levels of optimism and self-esteem (Chen, Greenberger, Farruggia, Bush, & Dong, 2003).

As with frequency of contact, the duration of mentoring relationships may have important implications for whether processes of change have sufficient opportunity to unfold in ways that benefit youth (Rhodes, 2002). Relationships that end after only a relatively short period of time, moreover, may leave youth susceptible to feelings of loss or rejection (Heaney & Israel, 2002). Consistent with these considerations, mentoring relationships of longer duration have been found to be associated with more positive youth outcomes (Grossman & Rhodes, 2002; Jekielek et al., 2002; Klaw, Rhodes, & Fitzgerald, 2003; McLearn et al., 1998). In a study of Big Brothers/Big Sisters programs, for example, Grossman and Rhodes (2002) found that relationships longer than one year in duration were associated with greater improvements in functioning, whereas relationships that ended after only a brief period (i.e., less than three months) were associated with decrements in functioning.

Limitations

Although existing research suggests the importance of mentoring relationship characteristics for youth outcomes, there are several limitations. First, to date, no studies have used large, nationally-representative samples (DuBois & Silverthorn, 2003). For findings related to mentoring relationship processes to be relevant to program development and evaluation, it is important that they be representative and generalizable. Second, there is a need to consider multiple relationship characteristics simultaneously. All of the characteristics discussed previously are potential predictors of a range of outcomes of interest based on available theory and research. There is also evidence, however, that these characteristics are interrelated (Beam, et al., 2002; DuBois, et al., 2002; Grossman & Rhodes, 2002; Klaw et al., 2003; Parra, DuBois, Neville, Pugh-Lilly, & Povinelli, 2002). For example, previous research indicates associations of frequency of contact with both closeness (Beam, et al., 2002; DuBois & Neville, 1997) and duration (Klaw et al., 2003) as well as between closeness and duration (Parra et al., 2002). In view of such associations, there is a need to understand the linkages that each type of characteristic exhibits with outcomes when controlling statistically for its overlap with other characteristics. Two final concerns relate to the assessment of adjustment outcomes. Most studies have examined mentoring relationship characteristics in relation to only a limited number of outcomes, often within a single domain of functioning (e.g., behavior). There thus is a need to understand how characteristics of interest relate to a range of outcomes across several major domains of functioning within the same sample of youth. Because studies often have been cross-sectional in

design (for notable exceptions, see Grossman & Rhodes, 2002; Klaw et al., 2003), there also is a need for longitudinal research. Studies that investigate relationship characteristics as predictors of adjustment after controlling for earlier adjustment levels and other potential confounds would be especially useful.

Present Study

The present study is an extension of an earlier investigation comparing youth in the nationally-representative sample of the Add Health study who did and did not report a natural mentoring relationship (DuBois & Silverthorn, in press). In particular, for those youth who did report mentoring relationships, several characteristics of these relationships (i.e., mentor role, frequency of contact, closeness, and duration) are examined as predictors of the same outcomes that were included in the previous investigation. One goal of the study was to examine, for those outcomes that differed in relation to the presence or absence of a mentor in the prior research, whether among those reporting mentors the same outcomes varied further in association with one or more reported characteristics of the mentoring relationship. A second goal was to examine, for those outcomes that were not predicted by the presence of a mentoring relationship, whether those outcomes nonetheless would exhibit associations with specific characteristics of mentoring relationships. Several features of the study address limitations in the existing literature on mentoring relationship processes. First, it is based on a nationally-representative sample of older adolescents and young adults, increasing the capacity for results to be generalizable. Second, multiple relationship characteristics are considered as potential predictors of adjustment outcomes, with statistical control for overlap between characteristics. Third, a diverse array of outcomes is examined across several major domains of functioning (i.e., education/work, problem behavior, psychological well-being, and physical health). Finally, analyses include control for initial levels of outcomes (when available), along with other relevant potential confounds (i.e., demographic characteristics and indicators of individual and environmental risk).

METHOD

Data for the present study are taken from the Wave I and III public use data sets of the National Longitudinal Study of Adolescent Health (Add Health; Udry, 1998, 2003). The Wave III public use data set contains 4,882 respondents selected randomly from the restricted use sample ($N = 15,197$). Add Health was based on a stratified, random sample representing high schools in the United States (Bearman, Jones, & Udry, 1997; Chantala, 2001; Chantala & Tabor, 1999). Youth from a representative sample of students in Grades 7-12 along with several special samples of youth at these same grade levels 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 equally distributed (Chantala & Tabor, 1999). To correct for design effects and unequal selection probability, procedures have been developed to ensure that unbiased parameters are obtained, including the use of sampling weights in data analyses to obtain unbiased nationally-representative estimates (Chantala, 2001; Chantala & Tabor, 1999). In the earlier study comparing mentored and non-mentored youth using these data (DuBois & Silverthorn, in press), the sample ($N = 3,187$) was limited to participants who met criteria for having or not having a mentor (as defined below; $n = 809$ did not meet criteria) and who had non-missing values for sampling weights and all covariates (see below for details on these measures; $n = 870$ had missing sample weights and $n = 16$ had missing values for other covariates). The sample for the present study is limited to those respondents from the earlier investigation who were determined to have had a mentoring relationship ($N = 2,323$). Respondents with missing data on the mentoring characteristics investigated in the current research also were excluded. These included 140 respondents whose responses did not meet criteria for any of the categories of mentor role (as defined below) and 130 who had missing data for one or more of the remaining mentoring characteristic variables of frequency of contact, closeness, and duration (described below). This resulted in a final sample size of 2,053.

Measures

Mentoring. Respondents having a mentoring relationship were identified as those who replied "Yes" to 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?" In the case of multiple mentoring relationships, respondents were asked to describe the "most influential" mentor. Respondents with a mentor identified the mentor's relationship to them (e.g., grandparent, teacher); those who identified a younger sibling, a spouse/partner, or a friend were excluded. For purposes of the present investigation, relationships were grouped into three *mentor role* categories: family (i.e., grandmother, grandfather, older sister, older brother, aunt, and uncle), informal (i.e., coach/athletic director, employer, co-worker, neighbor, and friend's parent), or professional (i.e., teacher/guidance counselor, minister/priest/rabbi, and doctor/therapist/social worker). Respondents who indicated "other" as a mentoring role or did not give a response to this item were excluded from the present study because they could not be grouped into a mentor role category. *Frequency of contact* was assessed as the average of two items asking about

face-to-face and other contact (e.g., phone calls or e-mail). Responses to each of these items were given on an eight-point scale (0 = "not at all"; 1 = "less than once a year"; 2 = "about once a year"; 3 = "every few months"; 4 = "about once a month"; 5 = "about once a week"; 6 = "two to five times a week"; 7 = "almost every day"). Relationship *closeness* was rated on a five-point scale (0 = "not close at all"; 1 = "only a little close"; 2 = "somewhat close"; 3 = "quite close"; 4 = "very close"). *Duration* of the mentoring relationship was assessed as the number of years that the mentor was reported to have been important in the respondent's life.

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 was comprised of 918 (44.7%) males and 1135 (55.3%) females. Respondents ranged in age from 18 to 26 at Wave III ($M = 21.3, SD = 1.6$). Race/ethnicity was grouped into the following categories: White ($n = 1306$; 63.6%), Hispanic ($n = 163$; 7.9%), African-American ($n = 451$; 22.0%), and Other (including Asian-American, Native American, and endorsement of other race/ethnic groups; $n = 133$; 6.5%). In study analyses, race/ethnicity variables were dummy coded with White as the reference group. Indications of individual and environmental risk were determined according to the same criteria that were used in the earlier investigation (DuBois & Silverthorn, in press). *Individual risk* was coded as present if the respondent reported one 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 828 respondents (40.3%) met criteria for individual risk. *Environmental risk* was coded as present if respondents endorsed two or more of the following at Wave I: parent receiving public assistance, not living in a two-parent family, no parent with a high school diploma, no parent working full time, having three 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 736 respondents (35.9%) met criteria for environmental risk. Approximately one-fifth of the sample ($n = 427$; 20.8%) met criteria for both individual and environmental risk.

Outcomes. Outcomes were assessed using Wave III measures, with corresponding Wave I indices utilized when available to allow control for initial levels of functioning. Wave III outcome and Wave I control variables are the same as those utilized in the earlier investigation (DuBois & Silverthorn, in press), with outcomes assessed in the same four domains: education and work, problem behavior, psychological well-being, and physical health. All outcome measures were dichotomized in the present study for several reasons. First, this allowed for direct comparison with results of the earlier investigation (DuBois & Silverthorn, in press) in which outcomes were represented in the same manner. Second, several outcomes already were dichotomous in nature (e.g., having completed high

Table I. Descriptive Statistics for Outcome Variables

| Wave I control variables | | | Wave III Outcomes | | | | | |
| | | | Variables in study analyses | | | Untransformed | | |
	M	SD		M	SD	M	SD	Mdn
Average grade	2.93	0.73	Completed high school	0.93	0.25	—	—	—
Average grade	2.93	0.73	College attendance	0.57	0.50	—	—	—
	—	—	Work 10+ hours/week[b]	0.75	0.43	—	—	—
Binge drinking	1.53	1.23	Binge drinking	0.13	0.34	—	—	—
Drug use	0.10	0.31	Drug use	0.24	0.42	—	—	—
Tried smoking[a]	0.52	0.50	Smoking	0.40	0.49	—	—	—
Delinquency	0.15	0.30	Gang membership	0.14	0.35	—	—	—
Hurt other in fight	0.20	0.52	Hurt other in fight	0.05	0.22	—	—	—
	—	—	Risk-taking	0.40	0.49	3.43	0.52	3.40
Self-esteem	4.11	0.63	Self-esteem	0.54	0.50	4.27	0.54	4.25
	—	—	Life satisfaction	0.87	0.34	4.24	0.76	4.00
Depressive symptoms	0.59	0.45	Depressive symptoms	0.13	0.34	0.48	0.43	0.33
Suicidal ideation[a]	0.12	0.33	Suicidal Ideation	0.07	0.25	—	—	—
General health	3.94	0.89	General Health	0.74	0.44	4.02	0.87	4.00
Physical activity level	1.31	0.71	Physical activity level	0.55	0.50	0.94	0.93	0.75
Previously had sex[a]	0.30	0.46	STD diagnosis	0.09	0.29	—	—	—
Previously had sex[a]	0.30	0.46	Birth control use[c]	0.71	0.45	—	—	—
Previously had sex[a]	0.30	0.46	Condom use[c]	0.43	0.50	—	—	—

Note. All Wave III variables used in study analyses were scored as 0/1; the means for each of these variables thus correspond to the proportion of respondents endorsing the outcome. For outcome measures that were dichotomized, the mean, standard deviation, and median of the measure prior to transformation also are provided.

[a]Variable scored as 0/1.

[b]Limited to respondents not currently in college ($n = 1, 123$).

[c]Limited to respondents who were sexually active during the year prior to the Wave III assessment ($n = 1,564$).

school). Third, the use of dichotomized outcome measures facilitated the interpretation of the relative impact of mentoring characteristics as predictors in study analyses. See Table I for descriptive statistics for both Wave III outcomes and Wave I controls, including statistics for Wave III measures that were dichotomized.

Education and work outcomes included *completed high school, college attendance*, and *working 10 or more hours per week* (all coded as Yes/No). College attendance was defined as either currently attending college (full- or part-time) or having already received a post-secondary degree (i.e., Associate's, Bachelor's, or graduate degree). Analysis of the work outcome was limited to those respondents who reported that they were not currently attending college. The Wave I control for the two education outcomes was average grade across four course areas (math, language arts, science, and 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* and *smoking* within the previous month (Yes/No),

gang membership (Yes/No), *hurting 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 comprised of five items). The internal consistency for the risk-taking scale was low (Cronbach's alpha $[\alpha] = 0.38$). However, the measure was retained in the analyses for the purpose of comparability with the previous study, in which there was evidence of a positive effect of mentoring on this outcome. Furthermore, although risk-taking is not itself a problem behavior, it was deemed to fit best conceptually within the problem behavior category (e.g., "Do you agree or disagree that you live your life without much thought for the future?", "I like to take risks"). Wave I control variables in the problem behavior domain included frequency of binge drinking in the previous year, frequency of drug use in the past month, having tried smoking (Yes/No), frequency of delinquent behavior (aggregate of items assessing violent and non-violent delinquency), and frequency of hurting another person in a fight during the previous year, respectively. No Wave I control was included for risk-taking. The Wave I control variables of frequency of binge drinking, frequency of drug use, frequency of delinquent behavior, and frequency of hurting another person in a fight were transformed using a base-10 logarithmic transformation prior to conducting study analyses due to the presence of substantial positive skew (i.e., >2).

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 III and Wave I. Life satisfaction had no corresponding Wave I control. *Self-esteem* was measured using a scale comprised of 4 items representing global feelings of self-worth (e.g., "Do you agree or disagree that you have many good qualities?") rated on a 5-point scale from 1 (strongly disagree) to 5 (strongly agree). Internal consistency reliability estimates for this scale were satisfactory for both Wave I ($\alpha = .79$) and Wave III ($\alpha = .77$). *Life satisfaction* was assessed using a single item ("How satisfied are you with your life as a whole?") rated on a five-point scale from 1 (very dissatisfied) to 5 (very satisfied). *Depressive symptoms* were measured using the average of nine items (Wave I $\alpha = .79$; Wave III $\alpha = .80$) from the Center for Epidemiologic Studies Depression Scale (Radloff, 1977). These items were rated on a 4-point scale from 0 (never or rarely) to 3 (most or all of the time). *Suicidal ideation* was assessed as the presence or absence of suicidal thoughts in the previous year (Yes/No). Wave III self-esteem and life satisfaction scores were dichotomized as high or low based on scores being above or below the sample median. Depression was dichotomized based on a cut-point corresponding to an average rating of 1 or higher on the 3-point response scale for these items.

Physical health outcomes included general health, physical activity level, STD diagnosis, and regular birth control and condom use. *General health* was rated at both Wave III and Wave I ("In general, how is your health?") on a 5-point scale from poor to excellent. *Physical activity level* was assessed at both Wave III

and Wave I as the mean of responses to multiple items indicating the frequency of participation in several physical activities during the previous week (e.g., "During the past week, how many times did you play an active sport?"). Wave III scores for general health and physical activity level were dichotomized using a median split. *STD diagnosis* reflected whether or not respondents reported having been treated for an STD in the previous year at Wave III. *Birth control* use and *condom use* were measured as whether or not 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. Analyses of birth control and condom use were limited to respondents who reported having been sexually active during the year prior to the Wave III assessment. The control for the three sexual health outcomes was whether or not respondents reported having been sexually active at Wave I.

Plan of Analysis

Preliminary analyses examined descriptive statistics for the mentoring characteristic variables (mentor role, frequency of contact, closeness, and duration) as well as the associations among these variables. In primary analyses, logistic regressions were conducted to examine the mentoring characteristic variables as predictors of outcomes in each domain (i.e., education and work, problem behavior, psychological well-being, and physical health). Logistic regression analyses provide Odds Ratio estimates, which are the odds of an outcome for one situation indicated by a predictor (e.g., high frequency of contact) relative to the odds of the same outcome for some other situation (e.g., low frequency of contact). An odds ratio estimate greater than one indicates an increased likelihood of the outcome with higher scores on the predictor, whereas an odds ratio estimate less than one indicates a decreased likelihood of the outcome (Tu, 2003). Sampling weights and study design effects were incorporated in the calculation of all logistic regression estimates using the SAS GENMOD procedure (Chantala & Tabor, 1999). Each regression included covariates (i.e., demographic characteristics and the indicators for individual and environmental risk) and indices of Wave I functioning (when available) as additional predictors.[3] Dummy codes were used to evaluate differences among all three mentor role groups (Pedhazur, 1997). In the primary regression analysis for each outcome, family was used as the reference group. This permitted the evaluation of both informal and professional roles for the mentor as predictors of outcomes relative to a family role. In order to evaluate the third between-role group difference (i.e., informal vs. professional role), an additional

[3]Interactions also were tested between the mentoring characteristic variables and indicators of individual and environmental risk by examining both two-way interactions (i.e., mentoring characteristic X individual risk and mentoring characteristic X environmental risk for each mentoring characteristic variable) and three-way interactions (i.e., each mentoring characteristic variable X individual risk X environmental risk). Consistent with findings of earlier research with this same data set (DuBois & Silverthorn, in press), no consistent pattern emerged with respect to mentoring characteristic variables as predictors of outcomes in interaction with either type of risk.

regression was conducted for each outcome with professional mentor role as the reference group. The mentoring characteristic variables of frequency of contact, closeness, and duration were standardized ($M = 0$, $SD = 1$) prior to conducting primary study analyses in order to facilitate interpretation of results. Odds ratios for these mentoring characteristic variables in the logistic regressions thus represent the change in the probability of occurrence for the outcome associated with a change in the predictor variable of one standard deviation. Finally, because of a substantial association between ratings of frequency of contact and closeness, an additional set of analyses was conducted in which each of these variables was examined as a predictor within logistic regressions that did not include the other variable as a predictor. That is, the regressions conducted in primary analyses as described above were repeated twice, once omitting closeness as a predictor and once omitting frequency of contact as a predictor. The focus in these analyses was to identify any instances in which frequency of contact or closeness were predictors of outcomes that might have been obscured when examining both variables together as predictors in primary analyses, given their substantial degree of association.

RESULTS

Preliminary Analyses

In terms of mentor role, over 40% of the sample ($n = 882$; 43.0%) reported mentors categorized as family (i.e., older brother, 8.9%; older sister, 8.9%; grandmother, 8.2%; grandfather, 2.8%; aunt, 8.5%; uncle, 5.6%). Approximately one-quarter of respondents ($n = 462$; 22.5%) reported mentors categorized as informal (i.e., coach, 6.2%; employer. 4.6%, co-worker, 5.0%; neighbor, 1.3%; friend's parent, 5.4%). Finally, the remaining, approximately one-third of the sample ($n = 709$; 34.5%) reported a mentor in a professional role (i.e., teachers or guidance counselors, 28.4%; minister, priest, or rabbi, 5.6%; doctors or therapists, 0.6%). The average ratings for both frequency of contact and closeness were approximately at the midpoint of each response scale ($M = 3.5$, $SD = 2.1$ and $M = 2.5$, $SD = 1.3$, respectively). Mentoring relationships ranged in duration from 1 to 26 years with an average duration of nearly nine years ($M = 8.9$, $SD = 7.1$).

Multiple regression analyses using dummy codes to represent mentor role were used to examine mentor role group in relation to the other three mentoring characteristic variables of frequency of contact, closeness, and duration (Pedhazur, 1997). In the first set of analyses, family was used as the reference group in order to evaluate both informal and professional roles for the mentor as predictors relative to a family role. To evaluate the third between-role group difference (i.e., informal vs. professional role), analyses also were conducted with professional mentor role as the reference group. Relative to respondents who reported a mentor in a family role, those who reported a mentor in an informal role reported lower levels of frequency of contact, closeness, and duration (standardized regression

coefficients $[\beta s] = -.27, -.36,$ and $-.59,$ respectively, $p < .001$); results were similar for the professional (versus family) mentor role ($\beta s = -.61, -.62,$ and $-.68,$ respectively, $p < .001$). Relative to those who reported a mentor in a professional role, those reporting a mentor in an informal role reported more frequent contact ($\beta = .27, p < .001$) and greater closeness ($\beta = .18, p < .001$), but did not report relationships of longer duration ($\beta = .01, ns$).

Bivariate correlations were used to examine associations among the three continuous (i.e., non-role) mentoring characteristic variables. Frequency of contact was associated significantly with closeness and duration ($r = .72$ and $.38,$ respectively, $p < .001$). Ratings of greater closeness also were associated significantly with reports of relationships with longer duration ($r = .46, p < .001$). Despite the magnitude of the correlation between frequency of contact and closeness (.72), they were considered as separate variables in primary analyses because they have been hypothesized to represent differing aspects of mentoring relationships (Rhodes, 2002).

Logistic Regression Analyses

Education and work. Results of logistic regression analyses predicting education and work outcomes are presented in Table II. Reporting a mentor in either an

Table II. Odds Ratios and 95% Confidence Intervals for Mentoring Characteristics Predicting Educational and Work Outcomes

	Completed high school		College attendance		Work 10+ hours/week[a]	
	OR	95% CI	OR	95% CI	OR	95%CI
Mentoring characteristics						
Informal (vs. Family)	2.29*	1.14–4.58	0.88	0.59–1.31	1.50	0.85–2.64
Professional (vs. Family)	2.90**	1.48–5.70	1.35	0.89–2.05	0.95	0.53–1.70
Informal (vs. Professional)	0.79	0.34–1.82	0.65**	0.48–0.89	1.58	0.87–2.87
Duration	1.03	0.77–1.39	1.04	0.90–1.21	1.10	0.89–1.36
Closeness	1.27	0.91–1.79	1.06	0.88–1.28	0.87	0.65–1.15
Frequency of contact	0.78	0.55–1.10	0.74*	0.63–0.87	1.14	0.89–1.46
Demographics						
Gender[b]	0.75	0.49–1.15	1.20	0.95–1.52	0.65*	0.46–0.92
Age	1.24**	1.06–1.44	0.93	0.85–1.01	1.24***	1.11–1.39
Hispanic[c]	0.69	0.36–1.30	1.44	0.84–2.48	1.00	0.53–1.87
African-American[c]	0.87	0.50–1.54	1.10	0.71–1.71	0.31***	0.17–0.55
Other race[c]	1.03	0.33–3.22	1.08	0.64–1.80	0.60	0.33–1.11
Individual risk	0.30***	0.17–0.54	0.75*	0.58–0.98	0.59*	0.37–0.94
Environmental risk	0.59*	0.37–0.93	0.59***	0.45–0.77	0.87	0.62–1.21
Wave I control	2.70***[d]	1.99–3.66	3.50***[d]	2.86–4.29	—[e]	—

[a] Analysis limited to respondents not currently in college.

[b] Gender coded as male (0) and female (1).

[c] Race/ethnicity variables are coded with White as the referent group.

[d] Wave I control is average grade.

[e] No corresponding Wave I control variable.

* $p < .05.$ ** $p < .01.$ *** $p < .001.$

informal or professional role was associated with a significantly greater likelihood of having completed high school, relative to reporting a mentor in a family role. In addition, reporting a mentoring in a professional role was associated with a significantly greater likelihood of college attendance, relative to reporting a mentor in an informal role (OR $= 1.54$; this estimate was obtained by inverting the odds ratio obtained for informal versus professional mentor role [0.65]). For this outcome, frequency of contact also was a significant predictor, but in the unexpected direction of reports of more frequent contact being associated with a *decreased* likelihood of college attendance. One factor potentially contributing to this finding is that youth who have gone on to college may have less direct contact with their mentors for this reason, thus leading to an association in an unexpected negative direction between this characteristic of relationships and college attendance. To address this possibility, a supplementary analysis was performed in which frequency of contact was assessed using only responses to the item that referred to "other" (i.e., not face-to-face) contact. In this analysis, frequency of contact no longer was a significant predictor of college attendance, although it did approach significance (OR $= 0.90$, 95% CI $= 0.78$-1.05, $p < .09$). For the outcome of working 10 or more hours per week, no mentoring variables, including mentor role, were significant predictors. It should be noted, however, that this analysis was limited to respondents who were not currently attending college ($n = 1,123$).

Problem behavior. Table III presents results of logistic regression analyses for problem behavior outcomes. Having a mentor in a professional versus an informal role was associated with a significantly decreased likelihood of reporting drug use in the past month (OR $= 0.70$; this estimate was obtained by inverting the odds ratio obtained for informal versus professional mentor role [1.43]). Relationship closeness also was a significant predictor of decreased likelihood of reporting drug use. With respect to smoking, reporting a mentor in a professional (as opposed to a family) role and reports of mentoring relationships of longer duration each were significant predictors of a decreased likelihood of reporting having smoked in the previous month. No mentoring characteristic variables, including mentor role, were significant predictors of binge drinking, gang membership, hurting another person in a fight, or risk-taking.

Psychological well-being. Results for logistic regression analyses predicting psychological well-being outcomes are shown in Table IV. Ratings of greater relationship closeness were a significant predictor of an increased likelihood of reporting relatively high levels of self-esteem and life satisfaction as well as a decreased likelihood of reporting a relatively high level of depressive symptoms and the presence of suicidal ideation. Mentor role was not a significant predictor of any outcomes in the domain of psychological well-being.

Physical health. Table V presents results for the physical health outcomes. Reporting a mentor in either an informal or professional role was associated with a greater likelihood of reporting both a relatively high level of physical activity and regular use of birth control, relative to reporting a mentor in a family role.

Table III. Odds Ratios and 95% Confidence Intervals for Mentoring Characteristics Predicting Problem Behavior Outcomes

	Binge drinking		Drug use		Smoking		Gang membership		Hurt other in fight		Risk-taking	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Mentoring characteristics												
Informal (vs. Family)	0.88	0.43–1.79	1.06	0.70–0.47	0.67	0.42–1.07	1.03	0.60–1.76	1.60	0.74–3.46	1.09	0.73–1.61
Professional (vs. Family)	0.69	0.33–1.44	0.74	0.47–1.16	0.57*	0.35–0.93	0.92	0.56–1.51	2.01	0.82–4.90	0.95	0.67–1.35
Informal (vs. Professional)	1.27	0.82–1.96	1.43*	1.03–1.98	1.17	0.85–1.62	1.12	0.72–1.74	0.80	0.39–1.64	1.14	0.86–1.53
Duration	1.00	0.78–1.27	1.10	0.92–1.33	0.78*	0.63–0.97	1.02	0.84–1.25	1.02	0.76–1.36	1.03	0.87–1.21
Closeness	0.83	0.69–1.01	0.82*	0.68–0.99	0.98	0.81–1.20	1.03	0.81–1.31	1.58	1.00–2.50	1.02	0.86–1.21
Frequency of contact	1.16	0.96–1.39	0.91	0.77–1.08	1.01	0.83–1.23	1.02	0.81–1.29	1.28	0.87–1.89	0.92	0.79–1.08
Demographics												
Gender[a]	0.26***	0.18–0.37	0.56***	0.45–0.70	0.63**	0.47–0.85	0.91	0.67–1.24	0.17***	0.10–0.28	0.52***	0.42–0.64
Age	0.93	0.84–1.02	0.82***	0.76–0.89	0.88**	0.81–0.95	1.02	0.92–1.13	0.84*	0.72–0.98	1.03	0.96–1.10
Hispanic[b]	0.81	0.42–1.57	0.47*	0.26–0.85	0.45***	0.29–0.70	1.02	0.58–1.80	0.53	0.17–1.66	0.82	0.54–1.26
African-American[b]	0.40***	0.25–0.64	0.82	0.61–1.11	0.40***	0.26–0.63	1.23	0.79–1.93	1.77*	1.03–3.04	0.48***	0.36–0.65
Other race[b]	0.64	0.36–1.14	0.56	0.31–1.01	0.26***	0.13–0.52	1.17	0.64–2.16	0.51	0.16–1.60	0.95	0.65–1.38
Individual risk	1.32	0.86–2.04	1.25	0.84–1.88	1.63*	1.09–2.42	1.05	0.68–1.65	1.37	0.69–2.74	1.22	0.86–1.73
Environmental risk	0.82	0.57–1.17	1.10	0.84–1.43	1.21	0.92–1.59	1.19	1.85–1.68	1.13	0.63–2.05	0.99	0.80–1.22
Wave I control	3.29***c	1.81–5.98	6.89***d	4.00–11.85	7.35***e	5.54–9.74	1.74f	0.37–8.30	6.38*g	0.46–26.43	—h	—

[a] Gender coded as male (0) and female (1).

[b] Race/ethnicity variables are coded with White as the referent group.

[c] Wave I control is frequency of reported binge drinking in the previous year.

[d] Wave I control is frequency of reported drug use in the past month.

[e] Wave I control variable is reporting having tried smoking (Yes/No).

[f] Wave I control is the average frequency of reported delinquent behavior.

[g] Wave I control is number of times respondent indicated having injured another person in a fight in the previous year.

[h] No corresponding Wave I control variable.

*$p < .05$. **$p < .01$. ***$p < .001$.

Table IV. Odds Ratios and 95% Confidence Intervals for Mentoring Characteristics Predicting Psychological Well-Being Outcomes

	Self-esteem		Life satisfaction		Depressive symptoms		Suicidal ideation	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Mentoring characteristics								
Informal (vs. Family)	1.01	0.70–1.48	1.30	0.76–2.24	0.99	0.57–1.73	0.60	0.28–1.26
Professional (vs. Family)	1.29	0.86–1.92	1.36	0.81–2.31	0.91	0.50–1.66	0.69	0.33–1.45
Informal (vs. Professional)	0.79	0.57–1.08	0.95	0.57–1.59	1.09	0.71–1.68	0.86	0.46–1.63
Duration	1.03	0.88–1.20	1.09	0.89–1.33	1.13	0.92–1.39	0.79	0.58–1.08
Closeness	1.27**	1.07–1.51	1.27*	1.01–1.59	0.76*	0.59–0.96	0.69*	0.49–0.97
Frequency of contact	0.90	0.77–1.04	1.01	0.82–1.26	1.07	0.87–1.30	1.22	0.88–1.68
Demographics								
Gender[a]	1.07	0.89–1.29	0.95	0.68–1.33	1.63**	1.13–2.37	0.95	0.61–1.49
Age	1.04	0.97–1.12	1.00	0.91–1.10	0.90	0.81–1.00	0.82*	0.71–0.96
Hispanic[b]	1.07	0.73–1.59	1.41	0.79–2.50	1.01	0.58–1.76	0.66	0.29–1.46
African-American[b]	1.17	0.88–1.55	0.60**	0.43–0.86	1.62*	1.06–2.47	1.00	0.57–1.76
Other race[b]	0.84	0.58–1.22	1.38	0.74–2.58	1.30	0.75–2.24	0.71	0.25–2.00
Individual risk	0.79	0.56–1.11	0.64	0.40–1.02	1.53	0.98–2.39	0.59	0.26–1.36
Environmental risk	0.99	0.77–1.28	0.56***	0.42–0.75	1.40*	1.02–1.92	1.61*	1.06–2.44
Wave I control	2.40***[c]	1.98–2.92	—[d]	—	4.16***[e]	2.98–5.80	3.91***[f]	2.25–6.82

[a]Gender coded as male (0) and female (1).
[b]Race/ethnicity variables are coded with White as the referent group.
[c]Wave I control is self-esteem scale score.
[d]No corresponding Wave I control variable.
[e]Wave I control variable is average frequency of reported depressive symptoms.
[f]Wave I control variable is reporting of suicidal ideation in the previous year (Yes/No).
*$p < .05$. **$p < .01$. ***$p < .001$.

Table V. Odds Ratios and 95% Confidence Intervals for Mentoring Characteristics Predicting Physical Health Outcomes

	General health		Physical activity level		STD diagnosis		Birth control use[a]		Condom use[a]	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Mentoring Characteristics										
Informal (vs. Family)	0.89	0.57–1.39	1.77**	1.23–2.56	1.67	0.95–2.91	1.74**	1.20–2.51	0.93	0.62–1.42
Professional (vs. Family)	0.81	0.50–1.31	1.92**	1.30–2.83	1.13	0.63–2.04	1.66*	1.09–2.53	1.16	0.76–1.77
Informal (vs. Professional)	1.10	0.77–1.56	0.93	0.69–1.23	1.47	0.85–2.56	1.05	0.73–1.50	0.81	0.55–1.19
Duration	0.93	0.76–1.13	1.20*	1.02–1.41	1.18	0.92–1.51	1.11	0.92–1.34	0.98	0.84–1.15
Closeness	0.98	0.81–1.19	1.27**	1.07–1.51	1.00	0.78–1.30	1.15	0.95–1.39	1.01	0.83–1.22
Frequency of contact	1.02	0.84–1.24	0.92	0.79–1.07	0.84	0.64–1.09	0.92	0.76–1.13	1.08	0.91–1.28
Demographics										
Gender[b]	0.86	0.64–1.15	0.67***	0.54–0.84	3.31***	2.17–5.05	0.90	0.70–1.18	0.55***	0.44–0.70
Age	0.97	0.90–1.04	1.04	0.98–1.10	0.92	0.81–1.04	0.96	0.88–1.04	0.87**	0.80–0.95
Hispanic[c]	0.66*	0.45–0.96	1.57*	1.04–2.37	0.82	0.40–1.68	0.80	0.47–1.38	1.64*	1.03–2.62
African-American[c]	0.73*	0.55–0.96	1.02	0.74–1.39	2.56***	1.60–4.08	0.69*	0.49–0.98	1.99***	1.46–2.71
Other race[c]	0.60*	0.38–0.93	1.05	0.68–1.62	1.02	0.44–2.34	0.52**	0.33–0.83	0.97	0.61–1.54
Individual risk	0.73	0.51–1.03	1.01	0.69–1.49	0.85	0.50–1.42	0.64*	0.45–0.91	0.81	0.53–1.22
Environmental risk	0.85	0.66–1.09	0.69**	0.54–0.89	1.51	0.97–2.36	0.76	0.55–1.04	0.77	0.58–1.03
Wave I control	2.32***[d]	1.98–2.70	1.84***[e]	0.57–2.16	2.78***[f]	1.80–4.30	0.62***[f]	0.47–0.82	0.69*[f]	0.51–0.92

[a] Analysis limited to respondents who were sexually active during the year prior to the Wave III assessment.

[b] Gender coded as male (0) and female (1).

[c] Race/ethnicity variables are coded with White as the referent group.

[d] Wave I control is self-rated general health.

[e] Wave I control is average physical activity level.

[f] Wave I control is whether or not respondent reported having had sexual intercourse at a time point prior to Wave I.

*$p < .05$. **$p < .01$. ***$p < .001$.

Relationships of longer duration and greater closeness also significantly predicted physical activity level. None of the mentoring characteristic variables, including mentor role, were significant predictors of general health, STD diagnosis, or condom use.

Analyses of frequency of contact and closeness as predictors without control for the other variable. When omitting closeness as a predictor, frequency of contact became a significant predictor of a reduced likelihood of drug use (OR = 0.81, 95% CI = 0.70-0.95, $p < .05$) and now was borderline significant as a positive predictor for life satisfaction (OR = 1.17, 95% CI = 1.00-1.36, $p = .05$). When omitting frequency of contact as a predictor, there were no further instances in which closeness reached or approached significance as a predictor of favorable outcomes. In these analyses, closeness remained a significant predictor for drug use, self-esteem, life satisfaction, and depressive symptoms and now approached, rather than reached, significance as a predictor of reduced likelihood of suicidal ideation (OR = 0.79, 95% CI = 0.59-1.02, $p < .08$).

DISCUSSION

Results of this study indicate that mentoring relationships experienced during adolescence vary in their impact depending on the specific features of these ties and their sources within the youth's life. Similar findings have been reported in previous research (Chen et al., 2003; DuBois & Neville, 1997; Greenberger et al., 1998; Grossman & Rhodes, 2002; Herrera et al., 2000; Hirsch et al., 2000, 2002; Jekielek et al., 2002; Klaw et al., 2003; McLearn et al., 1998; Parra et al., 2002). The current research extends this work, however, in its use of a large, nationally-representative sample, the simultaneous consideration of several mentoring relationship characteristics, the examination of these characteristics as predictors of a diverse range of outcomes, and the use of statistical control for earlier levels of functioning and other confounds.

One noteworthy aspect of the current findings is the manner in which mentors outside of the extended family system were linked to more positive outcomes in several areas. Compared to mentoring relationships with familial adults, ties with adults in either informal (non-familial) or professional roles were more likely to be associated with favorable outcomes in the domains of both education (completing high school) and physical health (physical activity level and regular use of birth control). These results are consistent with theory and research suggesting that supportive ties with adults in mentoring roles outside of the family system can benefit youth through mechanisms such as building social capital (Darling et al., 1994) and promoting competence in areas relevant to the adult's background (Rhodes, 2002). Education and physical health, furthermore, are areas in which family members often share similar attitudes and behaviors. Adults from outside the family thus may be better equipped to model and encourage alternative

perspectives or approaches in these areas. Non-familial adults similarly may be able to link young people more readily to appropriate outside resources relating to education and health.

It also appears that mentors with backgrounds in educational and other helping professions may have a relative advantage in promoting certain outcomes, specifically increasing the likelihood of college attendance and decreasing risk for drug use (in comparison with other types of non-familial mentors) and decreasing the risk of smoking (in comparison with mentors from the extended family). Teachers and guidance counselors comprised the large majority of mentors who were reported with professional roles. Previous research similarly found that formal mentor programs for youth were more effective when adults with backgrounds in helping professions (including education) were recruited as mentors (DuBois, et al., 2002). Social support from teachers and other school personnel, furthermore, has been linked previously not only with higher levels of academic achievement (e.g., Malecki & Demaray, 2003), but also with lower levels of smoking and drug use among adolescents (Lifrak, McKay, Rostain, Alterman, & O'Brien, 1997; Samdal, Wold, Klepp, & Kannas, 2000). Educators and other professionals often may engage in direct attempts to decrease youth risk for substance use, especially when their ties with young people take on a significant mentoring dimension (Pianta, Stuhlman, & Hamre, 2002). Conversely, adults in more informal and familial roles who are regarded as mentors may be more likely to model attitudes and behaviors that are perceived by youth as being accepting of substance use. This possibility is underscored by research in which youth perceptions of mentor engagement in and lack of negative sanctions for problem behavior predicted increased risk of youth engaging in the same behaviors themselves (Beam, Gil-Rivas, Greenberger, & Chen, 2002).

Greater reported closeness with mentors was associated consistently with positive outcomes in the domain of psychological well-being (greater self-esteem and life satisfaction, fewer depressive symptoms and reports of suicidal ideation). These findings are consistent with the hypothesized importance of feelings of mutuality, trust, and empathy in youth mentoring relationships (Rhodes, 2002). They also parallel research suggesting a particularly strong association between close mentoring ties and enhanced psychological well-being (Chen et al., 2003; Greenberger et al., 1998). Several factors could contribute to this type of linkage. Feelings of intimacy and reciprocity, for example, may create an atmosphere of trust in which youth can share personal and emotional concerns with mentors (Parra et al., 2002; Rhodes, 2002). The development of a close relationship with a mentor, furthermore, may promote a sense of mattering and being important to a significant other, thereby strengthening self-esteem and other aspects of psychological well-being (Harter, 1999; Short, Sandler, & Roosa, 1996). Reports of closeness with mentors also predicted reduced likelihood of drug use and greater levels of physical activity. The current investigation is apparently the first to examine mentoring relationship characteristics in association with these outcomes. It is possible,

however, that feelings of attachment to mentors increase the likelihood of youth identifying with them and thus modeling their healthy behaviors, such as refraining from substance use and engaging in regular exercise.

The relationship characteristics of duration and frequency of contact showed fewer associations with outcomes. Longer relationship duration was associated with decreased risk of smoking and greater physical activity. Both of these outcomes reflect healthy lifestyle choices on the part of young people that could be fostered by a long-lasting relationship with a mentor. In previous research, relationships of longer duration have been found more consistently to be associated with positive youth outcomes (Grossman & Rhodes, 2002; Jekielek et al., 2002; Klaw et al., 2003; McLearn et al., 1998). In the current study, it is possible that greater relationship duration also was reflected in reports of closeness and frequency of contact given that youth were asked to report on these characteristics with reference to the current status of the relationship. That is, relationships still active were more likely to be reported as close and, by definition, have greater reported levels of contact. Controlling for these other variables in analyses thus may have limited the potential for relationship duration to be uniquely predictive of outcomes. It also is the case that in the present research relationships were reported, on average, to be of long duration (i.e., 8.9 years), whereas prior research has focused on variations of duration within much shorter time frames (i.e., one to two years). The consequences of variation in relationship duration may be less pronounced among mentoring ties that have been maintained for several years.

Frequency of contact between the youth and mentor was not predictive of more positive outcomes in primary analyses. This characteristic, however, did exhibit substantial associations with reports of greater relationship closeness and duration, each of which was linked to favorable youth outcomes. Prior research similarly suggests that regular mentor-youth contact functions primarily as a context for the development of other relationship characteristics (e.g., closeness) and therefore is most likely to impact outcomes indirectly by fostering such characteristics rather than by having direct effects (Herrera et al., 2000; Parra et al., 2002). Parra et al. (2002), for example, found support for a model in which mentor-youth contact promoted greater benefits for youth indirectly via pathways involving relationship closeness. This would account for the finding in the present study that frequency of contact exhibited significant associations with reduced likelihood of drug use and greater life satisfaction in the supplementary analyses that omitted ratings of closeness as a predictor, but not when both variables were examined simultaneously as predictors in primary analyses.

In the previous investigation using the Add Health data set (DuBois & Silverthorn, in press), participants who reported a mentoring relationship demonstrated more positive outcomes in several areas, including high school completion, college attendance, working 10 or more hours a week, gang membership, hurting others in fights, risk-taking, self-esteem, life satisfaction, physical activity level, and regular use of birth control. In the current analyses, variation in reported

characteristics of mentoring relationships among this group was predictive of several of the same outcomes (i.e., high school completion, college attendance, self-esteem, life satisfaction, physical activity level, and regular birth control use). Findings thus suggest that positive effects of mentoring relationships for these outcomes are enhanced when the ties have certain characteristics such as emanating from sources outside of the family and being marked by feelings of closeness. For the remaining outcomes (i.e., working 10 or more hours a week, gang membership, hurting others in fights, and risk-taking), indices of relationship characteristics were not found to be significant predictors. For these outcomes, natural mentors may tend to provide benefits across the range of relationship characteristics that were reported in the sample. It also will be recalled that all mentoring relationships were, by definition, positive and influential ties as perceived by youth. Especially for the outcomes involved, all but one of which relate to problem behavior, the specific features of the mentoring relationship may be less important than the perception that there is an adult who is concerned about one's well-being and future.

There also were several outcomes that were not predicted by the reported presence or absence of a mentoring relationship (DuBois & Silverthorn, in press), but that nonetheless did vary in association with one or more relationship characteristics in this study (i.e., drug use, smoking, depressive symptoms, suicidal ideation). Substantively, these results underscore that simply having a mentoring relationship may not be sufficient to promote the full range of desired outcomes for a young person, but rather that relationships with certain characteristics may be needed (Rhodes, 2002). The current findings suggest that this may be especially true for the arguably "harder to reach" outcomes of preventing substance use and serious mental health problems. Methodologically, results in this area illustrate the manner in which hypothesized benefits of mentoring may become apparent only when analyses are broadened to consider relationships with specific characteristics. Previous research has been limited primarily to comparisons of youth reporting and not reporting mentors and therefore has not been sensitive to this possibility.

Applied Implications

To date, the organized mentoring movement has focused nearly exclusively on relationships established through formal programs such as Big Brothers/Big Sisters. In these programs, youth and adult volunteers are paired together with little or no prior contact. A major implication of the results of this study and those of the previous investigation (DuBois & Silverthorn, in press) is that greater consideration should be given to instituting policies and programs that cultivate mentoring relationships between adolescents and those adults who already are salient figures in different parts of their lives such as school, extracurricular activities, and neighborhoods. These efforts might take a variety of useful forms, all of which merit empirical investigation as to their actual effectiveness. First, strategies to promote

natural mentoring ties might be integrated within formal mentoring programs. For example, activities might be arranged to foster connections between the program mentor and the natural mentors in the youth's life, thus affording the opportunity for a more coordinated and effective system of overall support. Second, relevant forms of training and support for adults whose roles bring them into regular contact with adolescents may be beneficial (Zimmerman et al., in press). These types of efforts have the potential to enable relationships that might not otherwise evolve into mentoring ties to do so and to increase the quality and long-term viability of those that already have taken root. Finally, other strategies may be effective in helping to counteract prevailing societal attitudes and institutional practices that inhibit the natural evolution of mentoring ties between youth and adults. Communities and neighborhoods, for example, can be asked to agree on a social contract of shared responsibility for area youth, thereby potentially lessening actual and perceived barriers to adult involvement (Scales et al., 2003).

In view of the favorable outcomes associated with non-familial mentors in this research, efforts to promote mentoring ties between youth and adults whom they encounter in contexts outside of the home (e.g., school) clearly also are supported. We would issue an equally strong caution, however, against using the current results as a basis for devoting fewer resources to fostering mentoring ties between adolescents and members of either their immediate or extended families. It is noteworthy in this regard that for the present sample a range of behavioral and psychological outcomes show evidence of benefiting from mentoring regardless of the source of the mentor in the youth's life. The broader literature on natural mentors, furthermore, points to the family as being a prominent and influential source of mentoring in the lives of adolescents (Zimmerman et al., in press). Given these considerations, we recommend that efforts to cultivate natural mentoring ties cast a wide net and look to adults both inside and outside of the adolescents' family as resources.

Finally, regardless of which adults are targeted, consideration should be given to implementing strategies to help ensure the development of close emotional bonds between adolescents and potential mentor figures. Our findings indicate that such efforts may be especially important when salient mental health concerns for adolescents are of interest (e.g., self-esteem, risk for depression). There is also evidence that encouraging emotional intimacy within mentoring ties could facilitate efforts to address more behaviorally-oriented adolescent health concerns (e.g., drug use, exercise).

Limitations and Directions for Future Research

Several limitations of this investigation and directions for future research should be noted. First, although framed as a study of natural mentoring relationships, it is possible that some participants could have based their responses on a

relationship with a formal (program-assigned) mentor. Future research should take care to utilize assessments that distinguish between the two types of relationships. Second, the study was based on retrospective reporting of older adolescents and young adults regarding mentoring relationships experienced at any point since the age of 14. Ideally, future research should make use of prospective designs in which youth are followed from a point in time at which they identify a mentoring relationship. Third, the measures of mentoring relationship characteristics examined were relatively general. More refined measures should be used in future research to further elaborate the processes and conditions under which relationships are most likely to facilitate positive outcomes. These types of investigations may identify linkages with outcomes which were not evident for the measures used in the current research. There also should be sensitivity to the possibility that some characteristics of mentoring relationships may have implications for outcomes only for particular subgroups of youth or in conjunction with specific environmental circumstances. Finally, because of the large sample size and substantial number of tests of significance conducted, it should be kept in mind that some the associations reported may either reflect Type I error or be too small to be of practical importance. These possibilities underscore the need both for replication studies and for intervention research that addresses the applied implications of findings.

REFERENCES

Beam, M. R., Chen, C., & Greenberger, E. (2002). The nature of adolescents' relationships with their "very important" nonparental adults. *American Journal of Community Psychology, 30,* 305–325.

Beam, M. R., Gil-Rivas, V., Greenberger, E., & Chen, C. (2002). Adolescent problem behavior and depressed mood: Risk and protection within and across social contexts. *Journal of Youth and Adolescence, 31,* 343–357.

Bearman, P. S., Jones, J., & Udry, J. R. (1997). *The National Longitudinal Study of Adolescent Health: Research design.* Retrieved June 20, 2003 from http://www.cpc.unc.edu/addhealth

Beier, S. R., Rosenfeld, W. D., Spitalny, K. C., Zansky, S. M., & Bontempo, A. N. (2000). The potential role of an adult mentor in influencing high-risk behaviors in adolescents. *Archives of Pediatrics and Adolescent Medicine, 154,* 327–331.

Cauce, A. M., Mason, C., Gonzales, N., Hiraga, Y., & Liu, G. (1996). Social support during adolescence: Methodological and theoretical considerations. In K. Hurrelmann, & S. F. Hamilton (Eds.), *Social problems and social contexts in adolescence: Perspectives across boundaries* (pp. 131–151). New York: Aldine de Gruyter.

Chantala, K. (2001). Introduction to analyzing Add Health data. Retrieved June 20, 2003, from http://www.cpc.unc.edu/addhealth/files/analyze.pdf

Chantala, K., & Tabor, J. (1999). Strategies to perform a design-based analysis using the Add Health data. Retrieved June 20, 2003 from http://www.cpc.unc.edu/addhealth/files/weight1.pdf

Chen, C., Greenberger, E., Farruggia, S., Bush, K., & Dong, Q. (2003). Beyond parents and peers: The role of important non-parental adults (VIPs) in adolescent development in China and the United States. *Psychology in the Schools, 40,* 35–50.

Darling, N., Hamilton, S. F., & Niego, S. (1994). Adolescents' relations with adults outside the family. In R. Montemayor, G. R. Adams, & T. P. Gullotta (Eds.), *Advances in adolescent development: Adolescent close relationships* (Vol. 6, pp. 216–235). Newbury Park, CA: Sage.

DuBois, D. L., Holloway, B. E., Valentine, J. C., & Cooper, H. (2002). Effectiveness of mentoring programs for youth: A meta-analytic review. *American Journal of Community Psychology, 30,* 157–197.

DuBois, D. L., & Neville, H. A. (1997). Youth mentoring: Investigation of relationship characteristics and perceived benefits. *Journal of Community Psychology, 25,* 227–234.

DuBois, D. L., Neville, H. A., Parra, G. R., & Pugh-Lilly, A. O. (2002). Testing a new model of mentoring. *New Directions for Youth Development, 93,* 21–57.

DuBois, D. L., & Silverthorn, N. (2003, October). *Research methodology.* Paper presented at 2003 National Research Summit on Mentoring, Kansas City, MO.

DuBois, D. L., & Silverthorn, N. (in press). Natural mentoring relationships and adolescent health: Evidence from a national study. *American Journal of Public Health.*

Flay, B. R. (1986). Efficacy and effectiveness trials (and other phases of research) in the development of health promotion programs. *Preventive Medicine, 15,* 451–474.

Greenberger, E., Chen, C., & Beam, M. R. (1998). The role of "very important" nonparental adults in adolescent development. *Journal of Youth and Adolescence, 27,* 321–343.

Grossman, J. B., & Rhodes, J. E. (2002). The test of time: Predictors and effects of duration in youth mentoring relationships. *American Journal of Community Psychology, 30,* 199–219.

Harter, S. (1999). *The construction of the self: A developmental perspective.* New York: Guilford Press.

Heaney, C. A., & Israel, B. A. (2002). Social networks and social support. In K. Glanz, B. Rimer, & F. M. Lewis (Eds.), *Health behavior and health education: Theory, research, and practice* (3rd ed., pp. 185–209). San Francisco, CA: Jossey-Bass.

Herrera, C., Sipe, C. L., & McClanahan, W. S. (2000). Making mentoring relationships better: Program, matching and activity factors that contribute to mentors' positive relationships with youth. Philadelphia: Public/Private Ventures.

Hirsch, B. J., Mickus, M., & Boerger, R. (2002). Ties to influential adults among Black and White adolescents: Culture, social class, and family networks. *American Journal of Community Psychology, 30,* 289–303.

Hirsch, B. J., Roffman, J. B., Pagano, M. E., & Deutsch, N. L. (2000, April). Inner city youth: Ties to youth development staff and adult kin. In B. Sanchez (Chair), *Natural and volunteer mentoring relationships of adolescents.* Symposium conducted at the biennial meeting of the Society for Research on Adolescence, Chicago.

Institute of Medicine (1994). *Reducing risks for mental disorders: Frontiers for preventive intervention research.* Washington, DC: National Academy Press.

Jekielek, S. M., Moore, K. A., Hair, E. C., & Scarupa, H. J. (2002). *Mentoring: A promising strategy for youth development.* Washington: Child Trends.

Klaw, E. L., & Rhodes, J. E. (1995). Mentor relationships and the career development of pregnant and parenting African-American teenagers. *Psychology of Women Quarterly, 19,* 551–562.

Klaw, E. L., Rhodes, J. E., & Fitzgerald, L. F. (2003). Natural mentors in the lives of African American adolescent mothers: Tracking relationships over time. *Journal of Youth and Adolescence, 32,* 223–232.

Lifrak, P. D., McKay, J. R., Rostain, A., Alterman, A. I., & O'Brien, C. P. (1997). Relationship of perceived competencies, perceived social support, and gender to substance use in young adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry, 36,* 933–940.

Malecki, C. K., & Demaray, M. K. (2003). What type of support do they need? Investigating student adjustment as related to emotional, informational, appraisal, and instrumental support. *School Psychology Quarterly, 18,* 231–252.

McLearn, K. T., Colasanto, D., & Schoen, C. (1998). *Mentoring makes a difference: Findings from the Commonwealth Fund 1998 Survey of Adults Mentoring Young People.* New York: The Commonwealth Fund.

Munsch, J., Liang, S., & DeSecottier, L. (1996, March). *Natural mentors: Who they are and the roles they fill. A gender and ethnic comparison.* Presented at the biennial meeting of the Society for Research on Adolescence, Boston.

Parra, G. R., DuBois, D. L., Neville, H. A., Pugh-Lilly, A. O., & Povinelli, N. (2002). Mentoring relationships for youth: Investigation of a process-oriented model. *Journal of Community Psychology, 30,* 367–388.

Pedhazur, E. J. (1997). *Multiple regression in behavioral research* (3rd ed.). New York: Holt, Rinehart & Winston.

Pianta, R. C., Stuhlman, M. W., & Hamre, B. K. (2002). How schools can do better: Fostering stronger connections between teachers and students. *New Directions for Youth Development, 93,* 91–107.

Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general public. *Applied Psychological Measurement, 1,* 385–401.

Rhodes, J. E. (2002). *Stand by me: The risks and rewards of mentoring today's youth.* Cambridge, MA: Harvard University Press.

Rhodes, J. E., Contreras, J. M., Mangelsdorf, S. C. (1994). Natural mentor relationships among Latina adolescent mothers: Psychological adjustment, moderating processes, and the role of early parental acceptance. *American Journal of Community Psychology, 22,* 211–227.

Rhodes, J. E., Ebert, L., & Fischer, K. (1992). Natural mentors: An overlooked resource in the social networks of young, African American mothers. *American Journal of Community Psychology, 20,* 445–461.

Samdal, O., Wold, B., Klepp, K. I., & Kannas, L. (2000). Students' perception of school and their smoking and alcohol use: A cross-national study. *Addiction Research, 8,* 141–167.

Sanchez, B., & Reyes, O. (1999). Descriptive profile of the mentorship relationship of Latino adolescents. *Journal of Community Psychology, 27,* 299–302.

Scales, P. C., Benson, P. L., Mannes, M., Hintz, N. R., Roehlkeartain, E. C., & Sullivan, T. K. (2003). *Other people's kids: Social expectations and American adults' involvement with children and adolescents.* New York: Kluwer Academic/Plenum Publishers.

Short, J. L., Sandler, I. N., & Roosa, M. W. (1996). Adolescents' perceptions of social support: The role of esteem enhancing and esteem threatening relationships. *Journal of Social and Clinical Psychology, 15,* 397–416.

Tu, S. (2003). Developmental epidemiology: A review of three key measures of effect. *Journal of Clinical Child and Adolescent Psychology, 32,* 187–192.

Udry, J. R. (1998). The National Longitudinal Study of Adolescent Health (Add Health), Waves I & II, 1994–1996 (Data Sets 48-50, 98, A1-A3, Kelley MS, Peterson JL) [machine-readable data file and documentation]. Chapel Hill (NC): Carolina Population Center, University of North Carolina at Chapel Hill (Producer). Los Altos (CA): Sociometrics Corporation, American Family Data Archive (Producer & Distributor).

Udry, J. R. (2003). The National Longitudinal Study of Adolescent Health (Add Health), Wave III, 2001–2002 (Data Set Q1-Q9, McKean EA, Card JJ) [machine-readable data file and documentation]. J. Richard Udry, Carolina Population Center (Producer). Los Altos, (CA): Sociometrics Corporation, Data Archive on Adolescent Pregnancy and Pregnancy Prevention (Producer & Distributor).

Zimmerman, M. A., Bingenheimer, J. C., & Notaro, P. C. (2002). Natural mentors and adolescent resiliency: A study with urban youth. *American Journal of Community Psychology, 30,* 221–243.

Zimmerman, M. A., Bingenheimer, J. C., & Behrendt, D. E. (in press). Natural mentoring relationships. In D. L. DuBois & M. J. Karcher (Eds.), *Handbook of youth mentoring.* Thousand Oaks, CA: Sage.