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Perceived Parental Relationships and Health-Risk Behaviors in College-Attending Emerging Adults

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The present study investigated the association of perceived parenting with health-risk behaviors in an ethnically diverse sample of 1,728 college-attending emerging adults. Participants completed retrospective measures of perceived maternal and paternal nurturance, connection, psychological control, and disrespect and reported their frequency of binge drinking, illicit drug use, unsafe sexual behavior, and impaired driving. Multivariate Poisson regression analyses indicated that perceived paternal acceptance was associated inversely with 6 of the 12 health-risk behaviors measured, whereas perceived mothering was related only to 2 of these health-risk behaviors. These patterns were consistent across gender, ethnicity, and family structure.

Although much of the research on risk-taking behaviors is conducted on adolescents, the developmental context of risk taking is changing. In the past 25 years or so, as a result of social

and economic changes occurring during the late 20th and early 21st centuries, the developmental period during which risk taking peaks has shifted from adolescence to emerging adulthood—the late teens and the 20s (Arnett, 2000). The emerging adult life stage has resulted from disconnections and extended time between education and work and between family of origin and family of procreation (Côté, 2000). Many emerging adults attend college during this time and live semi-autonomously, while maintaining strong emotional and financial ties to parents.

Compared to adolescence, emerging adulthood has received far less attention from researchers and policymakers (Furstenberg, 2006). For some individuals, emerging adulthood is a time of elevated levels of illicit drug use, unsafe sexual behavior, and risky driving (Arnett, 2005). Although some risk taking is normative in adolescence and emerging adulthood (Schulenberg & Zarrett, 2006), behaviors such as binge drinking, illicit drug use, unsafe sexual behaviors, and driving under the influence of alcohol or drugs place individuals at risk for serious injury, disease, or death (Mokdad, Marks, Stroup, & Gerberding, 2004). Attenuating these high-risk behaviors is therefore an important public health priority.

Given the powerful roles of parents as agents of socialization throughout the life span, research suggests that relationships with mothers and with fathers in adolescence may help to explain some of these elevated levels of risk taking among emerging adults (cf. White, Johnson, & Buyske, 2000). Thus, there is an important need to attend to the long-term effects of parenting during this life stage. A small number of studies have examined effects of parenting processes in adolescence on outcomes in emerging adulthood. For example, Aquilino and Supple (2001) found that adolescents who reported high conflict with parents in adolescence were at increased risk for substance use as emerging adults. Summers, Forehand, Armistead, and Tannenbaum (1998) found that adolescents' ratings of conflict with mothers (but not fathers) in adolescence predicted criminal behavior in emerging adulthood. In a cross-sectional study, Fischer, Forthun, Pidcock, and Dowd (2007) found that psychological control and lack of connection, averaged across mothers and fathers, was predictive of college student alcohol problems. Abar and Turrissi (2008) reported that perceived parental disapproval of alcohol use in high school was

strongly and inversely related to alcohol use in college. These studies did not examine separate or additive effects of mothering and fathering on risk behaviors in emerging adulthood, however. Examining mothering and fathering as separate predictors may be important in building a research base regarding the different roles, functions, and influences of mothers versus fathers in the lives of emerging adults. Overall recollections of parenting received from mothers and from fathers might relate to a wide range of health-risk behaviors in college students, who are among the highest-risk subgroups of emerging adults (National Survey on Drug Use and Health, 2003).

Parental Acceptance-Rejection and Use of Retrospective Reports

Emerging adults' perceptions of their parents' past involvement are likely to influence their current thoughts, feelings, and behaviors (e.g., Rohner & Britner, 2002). These perceptions generally refer to the entirety and general affective valence of the parenting received (e.g., accepting vs. rejecting; cf. Rohner & Britner). As a result, we rely on parental acceptance-rejection theory (Rohner, 2004). This theory, which has been supported by evidence from around the world (Rohner & Britner), posits that perceived parental acceptance protects against psychopathology and engagement in externalizing and health-risk behaviors. As such, retrospective reports may be appropriate in studies of acceptance-rejection (Rohner & Britner). Indeed, emerging adults' ability to reflect back, from a mature perspective, on the parenting that they received during adolescence (Warshak, 2003) may speak to the appropriateness of acceptance-rejection theory and of retrospective reports for this age period (Finley & Schwartz, 2007). Parenting behaviors classified as accepting include warmth, attachment, and nurturance, whereas parenting behaviors classified as rejecting include disrespecting or disregarding the child, abusive or excessively controlling behavior, and neglect.

Parenting and Health-Risk Behaviors in Emerging Adulthood

Many emerging adults—especially those who go away to college—no longer live at home,

and as a result, relationships with parents are qualitatively different than in adolescence (Aquilino & Supple, 2001). Moreover, emerging adults may be more able than adolescents to reflect back on the totality of their relationships with their parents from a long-term perspective (e.g., Warshak, 2003). Given the importance of perceived parental acceptance for healthy development and risk avoidance in emerging adulthood (Aquilino, 2006; Aquilino & Supple), we examined the extent to which emerging adults' retrospective perceptions of their relationships with their parents may be protective against current health-risk behaviors.

Given the comparatively high rate of participation in health-risk behaviors in emerging adulthood (Arnett, 2005) and given strong inverse longitudinal relationships of parental warmth and communication to health-risk behaviors in adolescence (e.g., Beyers, Bates, Pettit, & Dodge, 2003), it stands to reason that parental acceptance-rejection should be related to health-risk behaviors in emerging adulthood. A limited number of studies have reported this general pattern, examining specific domains of parenting and specific indicators of emerging adult adjustment and risk taking (e.g., Aquilino & Supple, 2001; Clawson & Reese-Weber, 2003). Notwithstanding, there remains a need to examine associations of more general conceptions of parental acceptance-rejection with a more comprehensive set of risk behaviors.

On the basis of prior research with adolescents, both perceived maternal and paternal acceptance-rejection would be expected to be associated with emerging adults' health-risk behaviors. Mothers and fathers often play different roles in the family system (Parke, 2004), and relationships with mothers and fathers exert overlapping, but still somewhat unique, effects on child, adolescent, and adult outcomes (Diener, Isabella, Behunin, & Wong, 2008; Williams & Kelly, 2005). Although the contributions of mothers and of fathers overlap, research has demonstrated that mothers and fathers both can make distinct and important contributions to the likelihood of adolescents' participation in risk behaviors (e.g., Ackard, Neumark-Sztainer, Story, & Perry, 2006). For example, both relationships with mothers (Fanti, Henrich, Brookmeyer, & Kuperminc, 2008) and fathers (Carlson, 2006; Coley & Medeiros, 2007) are protective against problematic behavior over time, although the evidence is inconclusive

regarding the precise extent to which these maternal and paternal influences are overlapping versus unique. Some studies have found that maternal influences explain the majority of variability in adolescent outcomes and that paternal influences explain only a small amount of additional variability (King & Sobolewski, 2006; Williams & Kelly). Other studies have reported that both mothers and fathers contribute substantially to adolescent adjustment over time (e.g., Sheeber, Davis, Leve, Hops, & Tildesley, 2007). To examine these issues most effectively, maternal and paternal contributions must be studied *together* vis-à-vis adolescent and emerging adult psychosocial and health outcomes (Pleck & Masciadrelli, 2004). Such analyses would provide information about mothers' and fathers' unique contributions to adolescent and emerging adult risk behaviors as well as whether one parent's contributions are more closely related to risk behaviors in emerging adulthood (cf. Stolz, Barber, & Olsen, 2005).

Additionally, the extent to which findings from adolescent studies generalize to emerging adults is not known. Whereas effects of parenting on outcomes in adolescence center largely on limit setting and behavioral control (Caffman & Steinberg, 2000; Fletcher, Steinberg, & Williams-Wheeler, 2004), mentorship and development of independence (which may be an extension of limit setting and behavioral control) may have more far-reaching effects into emerging adulthood (Aquilino, 2006). These areas may fall more under the purview of the father's role (Finley & Schwartz, 2006). As a result, fathers may make more of a contribution to outcomes in emerging adulthood than in adolescence.

It is also essential to examine the extent to which these findings are applicable across emerging adult gender, ethnicity, and family structure. Parents may relate differently to same-gender versus opposite-gender children (Crouter, McHale, & Tucker, 1999), the importance of family may differ across ethnic groups (Toth & Xu, 1999), and indices of parenting have been found to differ across family structures (Finley, Mira, & Schwartz, 2008). If the same patterns of association emerge across these demographic variations, the results would be taken as supporting acceptance-rejection theory—which posits that the effects of acceptance-rejection are universal.

Research Questions and Hypotheses

The present study was a multisite investigation where the primary research objective was to examine the associations between parental acceptance-rejection and emerging adult health-risk behaviors. In accordance with parental acceptance-rejection theory, we hypothesized that both retrospectively perceived maternal and paternal acceptance would be associated inversely with binge drinking, illicit drug use, sexual risk taking, and impaired driving.

METHOD

Participants and Procedures

Data were collected from students at nine colleges and universities around the United States so as to provide a more diverse sample than would have been available at any one site. We sampled from large state universities, where the majority of students reside on campus or in off-campus apartments, as well as from smaller “commuter” colleges and universities, where the majority of students reside at home with parents or other nuclear family members. Study sites included schools in the Northeast, Southeast, Midwest, West, and Southwest.

Participants were recruited from courses in psychology, family studies, sociology, and education. All data were collected online during the fall of 2007. Participants were directed to the study website using printed and e-mailed announcements. Participants received course credit for their participation. Of students who logged in to the study website, 93% completed the entire survey. Because of the focus on emerging-adult risk taking in the college context, only traditional college-age participants (ages 18–22) were included in the present analyses. Participants included in the full data set but not in the present analyses included those outside of this age range ($n = 261$; 13.3% of the total sample) and those providing no data on either perceived parenting or risk behaviors ($n = 143$; 7.3%).

The sample for the present analyses consisted of 1,546 students (25% men, 75% women; 54% White, 9% Black, 24% Hispanic, 7% Asian, and 6% Other). The mean participant age was 19.29 years (SD 1.31 years). In terms of year in school, 45% were freshmen, 22% were sophomores, 19% were juniors, 12% were seniors, and 2% were graduate/special

students). Thirty percent of the sample reported living at home with parents or other family members, 39% reported living on campus, and 24% reported residing in off-campus houses or apartments.

Participants were asked to identify the most important mother and father figures in their lives while they were growing up. In our sample, 95% of participants identified their biological mothers as their most important mother figures, and 86% identified their biological fathers as their most important father figures. We used this information to classify participants into family structures, where family structures were defined in terms of the relationship between the participant’s “most important” maternal and paternal figures. Participants identifying both biological parents as their most important parental figures were classified as being from continuously married, divorced, or never-married families. For example, a participant rating her or his divorced biological mother and father would be classified as divorced, even if one or both parents had remarried. Participants were classified as being from stepfamilies only if they identified a stepmother or stepfather as one of their most important parent figures. Stepparents accounted for 4% of father figures and 1% of mother figures.

Sixty-nine percent of participants were from continuously married families, 22% were from divorced families, and 2% were from never-married families. Of the remaining 7% of the sample, 2% were from stepfamilies and identified a stepparent as one of their most important parent figures and 5% were from other family structures (e.g., one or both parents deceased). All of the results presented in this article were equivalent between the full sample and the subsample of participants rating both biological parents, so results from the full sample are presented here.

*Measures**Relationships With Parents*

Four perceived parenting constructs were assessed: nurturance, connection, psychological control, and disrespect. Participants completed each measure separately for their mother figure and for their father figure. All items were worded in the past tense, and participants responded

based on their relationships with their parents while the participants were in high school.

Nurturance. The Nurturant Parenting Scales (Finley & Schwartz, 2004; Finley et al., 2008) were used to assess parental nurturance. This scale consists of nine items answered on a 5-point Likert scale. The wording of the scale end points varies as a function of the item content, but for all items, a response of 1 indicates the *lowest level of nurturance* and a response of 5 indicates the *highest level of nurturance*. Sample items include “When you needed your mother’s/father’s support, was she/he there for you?” In the present data set, Cronbach’s α estimates were .92 for mother figures and .94 for father figures.

Connection. The Parental Acceptance subscale from the Child Report of Parental Behavior Inventory (Schaefer, 1965) was used to assess parental connection. This subscale consists of nine items answered on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Sample items include “My mother/father smiled at me very often when I saw her/him.” In the present sample, Cronbach’s α was .95 for mother figures and .96 for father figures.

Psychological control. Parental psychological control was measured using the psychological control subscale from the Child Report of Parental Behavior Inventory (Schaefer, 1965). From the original nine-item version of this subscale, one item was deleted because Krishnakumar, Buehler, and Barber (2004) found that it did not function equivalently across ethnicity. The remaining eight items were presented to participants along with a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Sample items include “My mother/father would avoid looking at me when I disappointed her/him.” In the present sample, Cronbach’s α estimates were .90 for mother figures and .89 for father figures.

Disrespect. A new eight-item scale developed by Barber (2007) was used to measure parental disrespect. Respondents answered the items using a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Sample items include “My mother/father ridiculed me or put me down (e.g., saying I am stupid, useless, etc.).” In the present sample, Cronbach’s α

estimates were .91 for mother figures and .90 for father figures.

Health-Risk Behaviors

Participants were asked how many times, in the 30 days prior to assessment, they had engaged in a variety of health-risk behaviors, using a 5-point scale: 0 (*never*), 1 (*once or twice*), 2 (*3–5 times*), 3 (*6–10 times*), or 4 (*more than 10 times*). We asked about frequency of binge drinking (four or more drinks in a row for women or five in a row for men; Naimi et al., 2003), as well as a number of types of illicit drug use, unsafe sexual behavior, and impaired driving. Under the heading of illicit drug use, we included items referencing marijuana use, hard drug use (e.g., methamphetamines, cocaine, crack), inhalant use, injecting drug use, and misuse of prescription drugs (i.e., any use not specifically prescribed by a doctor). Under the heading of unsafe sexual behavior, we included items referencing unprotected sex, oral sex, anal sex, casual sex (sex with someone whom the participant had met that same day), and sex under the influence of alcohol or drugs. Under the heading of impaired driving, we included items referring to driving, or riding with a driver who was, under the influence of alcohol or drugs. Risk behaviors were analyzed as count or zero-inflated count variables with the exception of binge drinking. For binge drinking, more than 99% of the sample provided responses of 0 or 1, so we converted binge drinking into a dichotomous yes/no variable.

RESULTS

As a preliminary analysis, given established differences in health-risk behaviors by gender (Johnston, O’Malley, Bachman, & Schulenberg, 2007) and between students living at home versus elsewhere (Chou et al., 2005), we examined differences in risk behavior participation by gender and between students residing at home and those residing elsewhere (see Table 1). All subsequent analyses were conducted using Mplus release 5.1 (Muthén & Muthén, 2007). Robust maximum likelihood estimation was used to include cases with missing data and to control for nonnormality. R. J. A. Little’s (1988) Missing Completely at Random (MCAR) test indicated

Table 1. Health-Risk Behaviors by Gender and Residential Status (N = 1,546)

Behavior	Overall Prevalence (%)	Gender			Living at Home		
		Male (%)	Female (%)	χ^2 (1)	Yes (%)	No (%)	χ^2 (1)
Binge drinking	21.2	32.4	17.5	34.97***	4.5	28.5	102.10***
Illicit drug use							
Marijuana use	40.7	45.6	39.2	4.47*	31.7	44.9	21.36***
Hard drug use	8.8	9.0	8.8	0.03	7.8	9.3	0.89
Inhalant use	6.2	8.2	5.6	5.29*	5.4	6.6	0.71
Injecting drug use	0.8	1.8	0.7	3.16	0.2	1.1	2.72
Prescription drug misuse	10.1	13.3	9.1	5.06*	5.9	12.0	12.12***
Unsafe sexual behavior							
Unprotected sex	48.3	44.5	49.3	2.42	46.1	49.2	1.17
Oral sex	68.2	71.9	66.8	3.10	64.1	70.2	4.97*
Anal sex	16.0	20.2	14.6	6.21*	16.6	15.8	0.16
Casual sex	18.9	24.9	17.2	10.24**	15.0	21.1	7.19**
Sex while drunk/high	45.6	47.3	45.0	0.57	33.9	50.9	34.51***
Impaired driving							
Driving while drunk/high	19.5	25.5	17.5	10.91**	16.9	20.7	2.69
Riding with impaired driver	40.9	41.4	40.9	0.03	38.6	42.1	1.60

Note: Percentages represent the proportion of each group reporting any engagement in the behavior in question during the 30 days prior to assessment.

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

that both the parenting variables, $\chi^2(80) = 96.65$, $p = .10$, and the risk behavior responses, $\chi^2(209) = 193.59$, $p = .77$, were missing completely at random, suggesting that maximum likelihood estimation was appropriate.

As an additional check, we examined the ratios of the variances for corresponding maternal and paternal variables. The variances for paternal nurturance and for connection to father were approximately 1.5 times as large as the variances for the corresponding maternal variables (65.94 vs .42.66 and 107.61 vs .75.87, respectively). The percentages of participants providing the two highest possible values (e.g., 44 and 45) for maternal nurturance and connection to mother (23% and 29%) were considerably higher than the corresponding percentages for the father variables (11% and 17%). The variances for maternal and paternal psychological control and disrespect were fairly equivalent (47.77 vs .54.67 and 50.35 and 57.09, respectively).

Factor Structure of Perceived Parenting

Parent acceptance-rejection theory considers the person's global impression of the quality

of the parent-child relationship, including both positive and negative dimensions. As a result, we first estimated a confirmatory factor analysis (CFA) model to ensure that the four indicators of perceived maternal acceptance-rejection could be reliably collapsed into a latent variable and likewise for the indicators of perceived paternal acceptance-rejection. The nonindependence between mother and father figures was handled by allowing the latent mothering and fathering variables to correlate. We evaluated the fit of this model to the data using the comparative fit index (CFI), the nonnormed fit index (NNFI), and the root mean square error of approximation (RMSEA). The chi-square statistic is reported but is not used in evaluating model fit because it tests the null hypothesis of perfect fit to the data and almost always yields a significant result in large samples and complex models (Kline, 2006). Good model fit is represented by CFI values of .95 or above, NNFI values of .90 or above, and RMSEA values of .06 or below (Hancock & Freeman, 2001). The CFA solution fit the data well, $\chi^2(13) = 73.06$, $p < .001$, CFI = .98, NNFI = .96, RMSEA = .06. Standardized factor loadings ranged in absolute value from .67 to .94 for mother

figures and from .61 to .93 for father figures. The correlation between the latent maternal and paternal acceptance-rejection variables was $r = .45$ ($p < .001$).

We also sought to determine whether the factor structures for perceived mothering and fathering would be isomorphic, that is, that the factor loadings would be equivalent for mother figures and for father figures. We tested this assumption by comparing the fit of a model with the factor loadings free to vary across parents against the fit of a model with the factor loadings constrained to be equal across parents. We evaluated the null hypothesis of equivalence of factor loadings (cf. Vandenberg & Lance, 2000) by comparing the fit of constrained and unconstrained models in terms of the chi-square difference, the difference in CFI values (ΔCFI), and the difference in NNFI values (ΔNNFI). A significant difference in fit would be signified by two of the following three criteria: $\Delta\chi^2$ significant at $p < .05$ (Byrne, 2001), $\Delta\text{CFI} \geq .01$ (Cheung & Rensvold, 2002), and $\Delta\text{NNFI} \geq .02$ (Vandenberg & Lance).

Our results suggested that the structures of mothering and fathering were significantly different, $\Delta\chi^2(4) = 118.79$, $p < .001$, $\Delta\text{CFI} = .020$, $\Delta\text{NNFI} = .023$. Following Byrne (2001), we returned to the fully unconstrained model and constrained one pair of indicators at a time to identify the dimension(s) of perceived parenting that were not isomorphic across mother and father figures. Analyses identified nurturance as responsible for the lack of invariance, $\Delta\chi^2(1) = 98.15$, $p < .001$, $\Delta\text{CFI} = .019$, $\Delta\text{NNFI} = .033$. The factor loading for nurturance was .60 for mother figures and .66 for father figures, suggesting that the difference in the strength of this factor loading between mother and father figures, although significant, was fairly small.

Perceived Parenting and Emerging Adult Health-Risk Behaviors

Our primary research aim was to examine the associations of perceived relationships with mother and father to health-risk behaviors. We estimated a model where perceived mothering and fathering were entered together as predictors of each of the health-risk outcomes. In this way, the contribution of perceived mothering could be examined controlling for the contribution of perceived fathering and vice versa.

Responses to the health-risk-behavior items tended to follow a Poisson distribution. This is true of most "count" variables where the person is asked how many times she or he engaged in sensitive or illegal behaviors. We analyzed these data using multivariate Poisson regression (cf. Atkins & Gallop, 2007). In Poisson regression models, the inverse log of each regression coefficient can be interpreted as an incidence rate ratio (IRR), which represents the multiplicative extent to which the expected count would be estimated to increase or decrease with each 1-unit increase in the predictor variable. We standardized the latent variables for relationships with mother and father figures (by constraining each latent variance to 1), such that the "units" in question would be standard deviations. As a result, the odds ratio (OR) or IRR represents the increase in likelihood or expected count given a 1 SD increase in the predictor variable.

Another important issue in analyzing count variables is the extent to which zeroes dominate the frequency distribution. In cases where 80% or 90% of respondents indicated no engagement in the behavior in question, there was very little variability to explain, and statistically significant results were unlikely to emerge. In these cases, it was necessary to use zero-inflated Poisson (ZIP) models (Atkins & Gallop, 2007), where the zeroes are modeled separately from the nonzero count data. The count variable was split into two parts, a dichotomous indicator reflecting whether or not the person engaged in the behavior in question and a count variable reflecting how many times the person engaged in the behavior. In cases where the person did not engage in the behavior, the count variable was specified as missing.

Although there is no established standard for the extent to which zeroes must dominate the distribution before ZIP models become necessary, we established 75% as our cutoff for the present study. Risk behaviors with less than 75% zero responses were modeled as simple count outcomes, whereas those with 75% or more zero responses were analyzed using ZIP models. Risk behaviors endorsed by less than 25% of the sample included hard drug use, inhalant use, prescription drug misuse, casual sex, anal sex, and driving under the influence of alcohol or drugs (see Table 1). Injecting drug use was reported by only 10 participants and was not used in analysis. Regression coefficients for dichotomous variables are expressed as odds

Table 2. Health-Risk Behaviors by Perceived Relationship With Mother and With Father (N = 1,546)

Variable	Mother OR/IRR	95% CI	Father OR/IRR	95% CI
Binge drinking ^a	1.04	0.85–1.28	0.92	0.74–1.15
Illicit drug use				
Marijuana use	0.98	0.92–1.05	0.91	0.92–1.04
Hard drug use ^b				
Yes/no	0.96	0.86–1.07	0.69***	0.38–0.73
Count	0.96	0.86–1.07	0.91[§]	0.82–1.01
Inhalant use ^b				
Yes/no	0.84	0.62–1.15	0.61**	0.43–0.87
Count	0.98	0.84–1.10	0.92	0.80–1.05
Prescription drug misuse ^b				
Yes/no	0.87	0.67–1.14	0.64**	0.47–0.86
Count	0.94	0.84–1.05	0.86**	0.77–0.96
Unsafe sexual behavior				
Casual sex ^b				
Yes/no	0.84*	0.71–1.00	0.78**	0.64–0.94
Count	1.02	0.95–1.09	0.91**	0.84–0.97
Unprotected sex	0.95	0.90–1.01	0.97	0.91–1.03
Oral sex	0.98	0.94–1.02	0.98	0.94–1.03
Anal sex ^b				
Yes/no	0.76**	0.63–0.90	0.89	0.63–1.07
Count	0.94	0.87–1.02	0.98	0.90–1.06
Sex while drunk/high	0.97	0.92–1.02	0.98	0.92–1.04
Impaired driving				
Driving while drunk/high ^b				
Yes/no	1.07	0.88–1.30	0.66***	0.54–0.81
Count	1.00	0.94–1.06	0.92*	0.86–0.98
Riding with impaired driver	1.02	0.95–1.06	0.91**	0.85–0.96

Note: Effects of mother are estimated controlling for father and vice versa. Significant findings are in bold.

^aAnalyzed as a dichotomous variable.

^bZero-inflated Poisson (ZIP) models were used for these outcomes.

[§] $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

ratios, and regression coefficients for count variables are expressed as incidence rate ratios.

Effects of site were controlled by creating dummy-coded variables for all but one of the sites and modeling these dummy variables as additional predictors of risk behavior outcomes. This is the preferred solution when there are not enough sites to estimate a multilevel model (Bengt Muthén, Mplus workshop, August 21, 2007). The reference group for these dummy variables was the site that provided the largest number of participants.

Results of the perceived parenting → health-risk behaviors model are shown in Table 2. Perceived paternal acceptance-rejection was associated negatively with engagement in 6 of the 12 health-risk behaviors assessed, including hard drug use, inhalant use, prescription drug

misuse, casual sex, driving while intoxicated, and riding with an impaired driver. Maternal acceptance-rejection was associated only with participation in casual sex and in anal sex. In a set of supplemental analyses (not presented here), we controlled for emerging adults' depressive symptoms, given that depressive symptoms are associated with both parental acceptance-rejection (Rohner & Britner, 2002) and with engagement in health-risk behaviors (Roiser & Sahakian, 2004). Results indicated that these relationships did not change appreciably when emerging adults' depressive symptoms were controlled.

We then attempted to ascertain the extent to which these relationships between perceived parenting and health-risk behaviors were consistent across gender, ethnicity, and family

structure (continuously married vs. divorced). Standard multigroup invariance tests are not available for use with models with dichotomous or count outcomes (Muthén & Muthén, 2007). Mixture models, using gender, ethnicity, or family structure as a “known class” variable, can be used to test for invariance in models with dichotomous or count variables, however. As in standard multigroup invariance testing, a model with all paths from perceived parenting to health-risk behaviors free to vary across gender, ethnicity, or family structure is compared against a model with these paths constrained to be equal. Although standard fit indices (e.g., χ^2 , CFI, NNFI, RMSEA) are not available in models with count outcomes, the invariance test can be conducted by computing the difference between the -2 log likelihood values for the constrained versus unconstrained models. This difference is distributed as a $\Delta\chi^2$ value and can be interpreted as such.

Mixture models with latent variables for perceived mothering and fathering and with gender, ethnicity, and family structure as known-class variables did not estimate properly in Mplus. As a result, we created observed composite variables for perceived mothering and fathering and estimated the mixture models using these composite parenting variables. Using observed composite variables as predictors reduced the mathematical complexity involved in estimating mixture models with latent predictor variables and count outcomes (Muthén & Muthén, 2007), thereby making the model much easier to estimate. We created these observed composite scores by standardizing the indicator variables, weighting them by their respective pattern coefficients from the confirmatory factor analysis models reported earlier in this results section, and summing these weighted standard scores (Thompson, 2004). This weighting procedure preserved the factor structure (i.e., differences in the strengths of item loadings) of each of the perceived parenting constructs. These composite variables therefore represented the shared variability among the four parenting dimensions for mother figures and for father figures. Results indicated that the model linking perceived parenting to health-risk behaviors fit the data equivalently across gender; the fit of the constrained and unconstrained models was not significantly different between genders, $\Delta\chi^2(34) = 31.37$, $p = .16$, across ethnicity,

$\Delta\chi^2(102) = 42.18$, $p = .44$, and across family structure, $\Delta\chi^2(34) = 23.92$, $p = .28$.

DISCUSSION

In the present study, we examined the extent to which college-attending emerging adults' perceived relationships with their mother figures and father figures during adolescence were associated with their current engagement in health-risk behaviors. Binge drinking, illicit drug use, unsafe sexual behavior, and impaired driving were closely related to many of the leading preventable and behaviorally based causes of death in the United States (Mokdad et al., 2004), including HIV, drug overdoses, and traffic fatalities. Participation in these behaviors tended to be most prevalent in emerging adulthood (Arnett, 2005; Furstenberg, 2006) and particularly among college students (National Survey on Drug Use and Health, 2003), suggesting that this age period and sample are appropriate, pertinent, and important for studying these risks.

We examined perceived maternal and paternal acceptance-rejection separately using parallel measures, which has been strongly recommended in the literature on the effects of parenting on child, adolescent, and adult outcomes (Pleck & Masciadrelli, 2004). To represent acceptance-rejection theory most accurately, we used highly reliable latent variables to capture the individual's overall feelings about her or his mother and father figures, ensuring that only variability shared among the four indicators (and representing acceptance-rejection) would be modeled as predictive of emerging-adult health-risk behaviors (T. D. Little, Lindenberger, & Nesselroade, 1999). Finally, we modeled health-risk outcomes in their natural metrics—as count and zero-inflated count variables—rather than attempting to transform or rescale them to meet the assumptions of more commonly used statistical analyses (Coxe, West, & Aiken, 2009). As a result, the statistical validity of the present results may be particularly high.

Findings indicated that college students' feelings that they were accepted by their parents (and especially their father figures) as adolescents appear to be strongly protective against a number of health-risk behaviors. These risk behaviors include illicit drug use (marijuana, hard drugs, and inhalants, as well as misusing prescription drugs), casual sex, driving under

the influence of alcohol or drugs, and riding with a driver who has been drinking or using drugs. These protective effects appeared to be strongest for some of the more dangerous and low-frequency risk behaviors that we assessed (hard drug use, inhalant use, prescription drug misuse, casual sex, and impaired driving), and less strong for more normative behaviors such as binge drinking, marijuana use, and oral sex.

Studies of adolescents (e.g., Williams & Kelly, 2005) have found that perceptions of father figures contributed only incremental variability in psychosocial outcomes over and above the contributions made by perceptions of mother figures. In contrast, the present results suggest that, among college-attending emerging adults, perceived acceptance from father figures makes a considerable unique contribution to many of the health-risk behaviors examined, above and beyond any shared variance with perceived maternal acceptance-rejection. Once perceived fathering was taken into account, perceived mothering was related only to participation in casual sex and in anal sex. These results—obtained after the emerging-adult children were of legal age and were predominantly responsible for their own development and behavior—speak strikingly of the long-term impact of perceived fathering on emerging adult children's lives, particularly in avoiding seriously health-compromising behaviors. Given that perceptions of mothering tend to be high in most cases (Finley et al., 2008), these results suggest that the additional presence of an involved and nurturing father figure provides additional protection against health-risk behaviors.

These results are consistent with extant research establishing paternal involvement and relationship with father as protective against problematic behaviors in adolescence (Carlson, 2006; Coley & Medeiros, 2007) and extends this literature into emerging adulthood. Although supplemental analyses (not presented here) suggested that both perceived maternal and paternal acceptance-rejection were inversely related to most of the health-risk behaviors at the bivariate level, at the multivariate level, perceived fathering was related to a wider array of these behaviors.

Importantly, perceived paternal acceptance appears to be powerfully predictive in protecting emerging-adult college students from drug, sex, and driving-related risk behaviors for both men

and women, across the four major ethnic groups that comprise most of the U.S. population, and regardless of whether the person's parents lived together while she or he was growing up. Of participants from divorced families in the present sample, only 5% reported residing with their fathers following their parents' divorce, and 15% reported joint custody. This suggests that 80% of the divorced fathers in our sample were primarily nonresidential, yet these fathers appeared to exert a similar amount of influence on their college-age children's participation in health-risk behaviors as fathers who lived with their children. This finding coincides with those of Coley and Medeiros (2007) and King and Sobolewski (2006), who found nonresident father involvement to be protective against externalizing problems in adolescence. In contrast to King and Sobolewski, however, we found that perceived fathering was more closely related to the risk behaviors that we assessed than was perceived mothering. It may be that perceived fathering has longer term effects on emerging-adult college-student risk behavior than on behaviors in adolescence. Guidance, support, and nurturance received from parents may help emerging-adult college students to transition into adult roles. Although both mother and father figures may provide these resources, the present results suggest that positive involvement from father figures may be more closely linked to protection against health-compromising behaviors in this group.

It is also possible that ceiling effects may have contributed to the present findings. As noted in the Results section, the variances for paternal nurturance and for connection to father were approximately 1.5 times as large as the variances for the corresponding maternal variables. The resulting variance restriction may have limited the ability of perceived mothering to relate significantly to the health-risk behaviors at the multivariate level. Again, however, it should be noted that perceived mothering *was* significantly related to nearly all of the health-risk behaviors at the bivariate level.

If replicated on more representative samples, the present findings suggest that parents—and especially fathers—are critical in guiding their children through the transition to adulthood (cf. Aquilino, 2006; Finley & Schwartz, 2007). Just as parenting in early and middle adolescence involves allowing for individuation while still providing supervision and setting

appropriate limits (Steinberg, 2001), parenting in late adolescence and emerging adulthood may require nurturing the young person's increasing independence and autonomy while still providing guidance and support. More research is needed to provide additional support for this proposition. Moreover, although the present results suggest that relationships with father figures may be "closer" to health-risk behaviors during this developmental period, more research is needed to determine the relative importance of acceptance from mother and father figures in relation to other types of outcomes (e.g., romantic relationships, career development) in emerging adulthood.

Limitations

The present results should be interpreted in light of several important limitations. First, the use of a university student sample may have screened out individuals with limited financial, emotional, and intellectual resources. Because college students differ from nonstudent emerging adults on a number of important demographic, socioeconomic, and psychosocial variables (Halperin, 2001), it is important to include both types of emerging adults in future studies.

Second, the use of cross-sectional and retrospective data on perceived parenting represents a potential limitation. Although emerging adults' perceptions of their parents' past involvement are associated with their current thoughts, feelings, and behaviors (e.g., Finley & Schwartz, 2007; Rohner & Britner, 2002), longitudinal data would provide stronger evidence for directionality in the association between relationships with parents and emerging-adult health-risk behaviors. It is possible that events currently occurring may have influenced individuals' retrospective reports of the parenting that they received. Different results might have emerged had we collected information on participants' current relationships with their parents or on parents' own perceptions of their relationships with their emerging-adult children. The retrospective method does, however, allow us to include both individuals who resided with family members and those who did not, without the potentially confounding effects of current frequency of contact.

Third, although we were able to test for invariance between continuously married and divorced families, the representation of

other family structures (e.g., stepfamilies, never-married families) was too small to support formal tests of invariance. Although the findings were nearly identical using the full sample versus using only individuals from continuously married and divorced families, purposefully sampling individuals from less well-represented family structures would make it possible to conduct tests of invariance across a wider range of family structures. Similarly, although we were able to test for invariance across gender, a more gender-balanced sample might have produced different results. The present findings with regard to gender should be replicated with a more representative sample.

Fourth, although we examined maternal and paternal acceptance-rejection in relation to health-risk behaviors in emerging adulthood, we did not include specific dimensions of parenting such as emotional support, mentorship, and developing independence. It is important for future research to do this, with the goal of identifying the specific domains of mothering and fathering that may be most protective against emerging-adult health-risk behaviors.

In conclusion, and despite these limitations, the present study has generated important findings regarding the role of perceived fathering in emerging-adult risk behaviors. These results further suggest that perceived paternal acceptance-rejection, as measured by an underlying structure of nurturance, connection, psychological control, and disrespect, can help to predict which emerging adults may be at elevated risk for health-compromising behaviors (and how severe their engagement in these behaviors will be). It is hoped that the present results inspire further research, with more representative samples, on the effects of perceived mothering and fathering on health-risk behaviors in emerging adulthood.

NOTE

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