Original article

The Profundity of the Everyday: Family Routines in Adolescence Predict Development in Young Adulthood

Allen W. Barton, Ph.D.[a,*], Gene H. Brody, Ph.D.[a], Tianyi Yu, Ph.D.[a], Steven M. Kogan, Ph.D.[a,b], Edith Chen, Ph.D.[c], and Katherine B. Ehrlich, Ph.D.[a,d]

[a] Center for Family Research, University of Georgia, Athens, Georgia
[b] Department of Human Development and Family, University of Georgia, Athens, Georgia
[c] Department of Psychology, Institute for Policy Research, Northwestern University, Evanston, Illinois
[d] Department of Psychology, University of Georgia, Athens, Georgia

ABSTRACT

Purpose: The current study was designed to investigate the unique, long-term effects of family routines during adolescence on multiple developmental domains in young adulthood for rural African-Americans.
Methods: Prospective data were collected annually for 6 years from 504 rural African-American youth and their parents, beginning when the youth were 16 years of age.
Results: Results indicated that youth whose primary caregivers reported more family routines during adolescence (e.g., regularly eating together as a family, consistent bedtime) reported less alcohol use, greater emotional self-regulation, lower epinephrine levels, and higher rates of college/university enrollment in young adulthood. These effects were evident for all outcomes controlling for socioeconomic risk, sex, and available baseline (age 16 years) measures; for a subset of outcomes, the effects of family routines persisted even after taking into account levels of supportive parenting, harsh parenting, and household chaos.
Conclusions: Findings substantiate the benefits of consistent, predictable family environments for healthy development and suggest that family routines constitute an important, yet understudied, factor for adolescents' long-term development.

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IMPLICATIONS AND CONTRIBUTION

African-American adolescents experiencing more family routines across ages 16−18 years exhibited, in young adulthood, lower alcohol use and epinephrine levels, higher emotional self-regulation, and greater likelihood of being enrolled in a 4-year university. These effects generally persisted with potential confounding variables of SES risk, parenting, and household chaos controlled.

The rural southeastern United States is one of the most impoverished regions in the country. Poverty and other aspects of disadvantage are powerful influences on children's lives, forecasting lifelong trajectories in cognitive development [1], psychosocial development [2], and physical health [3]. Despite their elevated risk, many African-American youth who grow up in this region exhibit positive adjustment during adolescence and into young adulthood. Identifying protective factors that contribute to the long-term development of rural African-American and other at-risk adolescents remains pivotal to public health research and practice.

Decades of research underscore the influence of the immediate family context for adolescents' long-term development [4]. To date, most of this research has focused on interpersonal (i.e., functional) aspects of the parent−child relationship, such as supportive parenting practices and overall relationship quality [4]. In addition to these

often-studied constructs, emerging findings from studies with adolescents [5,6] as well as prior research with young children [7] converge to suggest that more *structural* aspects of the family environment—such as the degree of consistency, routinization, and stability in the home—may confer similar wide-reaching benefits for youth. Boyce et al. [8], in one of the first systematic investigations on the topic, described predictable, repeated, consistent patterns that characterize day-to-day home life—hereafter called family routines—as the fundamental "organizational units of ordinary life in families" (p. 194), which are fundamental to the health and well-being of the family and its individual members. Bronfenbrenner [9] similarly noted that healthy development necessitates an immediate environment characterized by predictability and consistency [10]. More recently, leading developmental scientists have similarly maintained that predictability in one's environment is foundationally important to an understanding of human development [10]. Consistent with this position, research on family routines with adolescents, although limited, has found associations between the degree of routinization in the home and children's mental health, physical health, academic achievement, and delinquent behavior [5,11,12]. Research on household chaos, a related but distinct construct from family routines, has also documented that disorganized and chaotic family environments forecast impaired cognitive, physiological, and psychosocial development in children [13,14].

The benefits of family routines, if confirmed, have significant implications for broadening basic and applied research with adolescents. Empirical support for the centrality of family routines for adolescent development, however, remains limited in three important ways. First, few studies of family routines have controlled for prominent parenting behaviors (e.g., support and harshness) and other family environment characteristics (e.g., chaos) that are known to influence development [6,12,13]. Thus, it remains unclear whether predictable, well-structured family environments exert a unique effect on adolescents' development or constitute an artifact of parenting processes and/or levels of household chaos. Second, most research on family routines has concentrated on psychological outcomes with primary school-aged children [7,15]. Consequently, little empirical work has investigated the long-term effects of family routines during adolescence on outcomes in young adulthood, and few studies have also considered the effects of family routines on nonpsychological outcomes at any life stage (for exception, see [6]). Third, minority families and those of low socioeconomic status (SES) appear to be under-represented in this research, despite their elevated risk for experiencing unpredictable and chaotic family environments [16].

To address these limitations, the present 6-year longitudinal study investigated the unique effects of family routines during adolescence on four outcomes when participants were in young adulthood: alcohol use, emotional self-regulation, epinephrine and norepinephrine levels (biological markers of stress resulting from sympathetic nervous system activation), and 4-year university enrollment. These outcomes were selected because they provide developmentally appropriate constructs in domains for which family routines have proven influential in children (i.e., behavioral, psychosocial, physiological, and educational) [5,7,12,13]. On the basis of the previously reviewed literature, we hypothesized that greater levels of family routines during adolescence would be associated with less alcohol use and lower stress hormones as well as greater emotional self-regulation and likelihood of university enrollment. We also conducted moderation analyses to examine whether any effects of family routines on young adult outcomes varied as a function of family characteristics (e.g., socioeconomic risk, parental employment status, and household chaos). Hypotheses were tested from a well-characterized sample of rural African-American adolescents and youths' primary caregiver, with six waves of data collected yearly beginning when youth were 16 years of age. Analytic models included supportive parenting, harsh parenting, family SES risk, youth sex, household chaos, and baseline measures (as available), thereby ruling out several alternative explanations for the hypothesized association of family routines with young adults' outcomes.

Methods

Participants

The present study included a subsample of participants in a longitudinal study of African-American families that began when youth were 11 years of age. All families resided in small towns and communities in rural Georgia in which poverty rates are among the highest in the nation and unemployment rates are above the national average [17]. From lists that schools provided of fifth-grade students, 667 families were selected randomly for an initial assessment [18]. Family routines were first assessed when the youth's mean age was 16 years (M = 16.00; standard deviation [SD] = .38). For the current study, we selected individuals who had completed at least the age of 16- or 17-year assessment to satisfy requirements for missing data estimation. The final study sample included 504 participants. Comparisons of these 504 youth with the 163 who were not included revealed no differences at study enrollment in parenting practices, youth sex, parental education, or other demographic variables (e.g., poverty status). Of the youth in the final sample, 54% were female. Median family income per month was $1,849 (SD = $2,583); 46% of the families' incomes were below 100% of the poverty level, and another 21% of the families' incomes were between 100% and 150% of the poverty level.

Procedures

Six waves of data were collected on an approximately annual basis, three during adolescence (mean ages 16, 17, and 18 years) and three during young adulthood (mean ages 19, 20, and 21 years). Primary caregivers consented to their minor youth's participation in the study, and minor youth assented to their own participation. Youth at age 18 years and older consented to their own participation. African-American field researchers visited families' homes to administer computer-based interviews at each wave of data collection using a standardized protocol. All assessments were conducted in private. Overnight urine voids were collected during all three waves in young adulthood. Participants were compensated $100 at each data collection wave. The study's protocol was approved by the institutional review board of the university at which the research took place.

Measures

Family routines. Primary caregivers reported on routinization in the family using seven items adapted from the Family Routines Inventory [18]. Sample items, which were answered dichotomously (1 if true and 0 if false), included, "We eat together as a family once a day," "[Youth] goes to bed at a regular time," and "Children in my house do regular household chores." Items were summed, with a possible range of 0−7.

Supportive parenting. Parents reported supportive caregiving practices using four items adapted from a scale that Carver et al. [19]

developed; parents responded when youth were 16, 17, and 18 years of age. A sample item was, "[Youth] gets emotional support from me" (1 = *not at all true*; 5 = *very true*). Items were summed, and the resulting composite score was averaged across the three waves of data collection (Cronbach's alpha ≥ .79 at all waves).

Harsh parenting. Parents' reports of verbally and physically harsh parenting were assessed using a four-item scale [20]; parents responded to this measure when the youth were 16 and 17 years of age. A sample item was, "When [Youth] does something wrong, how often do you blow up at [him/her]?" (1 = *never*; 5 = *always*). Items were summed, and the resulting composite score was averaged across the two waves of data collection (Cronbach's alpha ≥ .56 at each wave). Low internal consistency for measures of harsh parenting is common in the literature given low base rates of these disciplinary practices [21].

Household chaos. Chaos and disorganization in the home was assessed using the 15-item Confusion, Hubbub, and Order Scale [22]. Parents were asked to indicate as true (1) or false (0) statements about life in their homes. Examples included, "There is often a fuss going on at our home" and "No matter what our family plans, it usually doesn't seem to work out." Items were summed, with a possible range of 0–15.

Family SES risk. Family SES risk was computed from a six-item index of parent-reported sociodemographic factors. Six standard risk indicators were assessed (e.g., primary caregiver noncompletion of high school; family receipt of Temporary Assistance for Needy Families), with each risk factor scored dichotomously (0 if absent, 1 if present [18]). Items were summed at each wave, with a possible range of 0–6. Scores at each wave were then averaged to create an assessment of mean family SES risk during the youth's high school years.

Alcohol use. Assessments of the frequency of past-month alcohol use, drawn from the Monitoring the Future study [23], were administered when youth were at ages 19, 20, and 21 years. Youth were asked at each wave, "During the past month, on how many days have you had a drink of alcohol?" (0 = *none*; 5 = *twenty or more*). The mean of responses across the three waves were summed to create a composite score of alcohol use from 19 to 21 years of age.

University enrollment. Current enrollment in, or graduation from, a 4-year college/university enrollment was assessed from demographic questions asked at the last assessment. Specifically, participants were asked, "Are you currently enrolled in school or any type of educational program?" and "What is the highest level of education you have completed?" Individuals were coded as "1" if they responded to the first question with "*Yes, I am currently enrolled in a four-year college or university*"; or responded to the second question with "*Bachelor's Degree (BA or BS)*" or higher (all other individuals' were coded as "0"). Twenty-six percent reported enrollment in, or graduation from, a 4-year college/university at the final assessment wave.

Emotional self-regulation. Youth's emotional self-regulation was assessed as a latent variable with three indicators: self-regulation, emotional reactivity, and hostility. Self-regulation was measured using a 17-item questionnaire [24], emotional reactivity was assessed using a six-item scale [25], and hostility was assessed using an eight-item measure [26]. Sample items for self-regulation, emotional reactivity, and hostility were, respectively, "I'm able to accomplish goals I set for myself," "I operate on a short fuse when my emotions are involved," and "You have a lot of anger inside you." Responses ranged from 1 (*strongly disagree*) to 4 (*strongly agree*) for self-regulation and from 1 (*strongly disagree*) to 5 (*strongly agree*) for emotional reactivity and hostility. Items at each wave were summed and then averaged across ages 19–21 years for each construct; the mean composite scores were used as the observed values for the latent variable. Cronbach's alphas across all waves were ≥ .91 for self-regulation, ≥ .63 for emotional reactivity, and ≥ .90 for hostility.

Epinephrine and norepinephrine. The epinephrine and norepinephrine measurement protocol was based on procedures that Evans [27] developed for field studies involving children and adolescents. Details of these protocols in the current sample are reported elsewhere [28]. In brief, on the day of each data collection visit, participants received instructions and supplies for collecting all urine voided overnight from 8 P.M. to 8 A.M. The following morning, a research assistant visited the home and transported the urine to a university laboratory. Epinephrine and norepinephrine were assayed with high-pressure liquid chromatography with electrochemical detection; levels of each biomarker were averaged across the three assessments. The catecholamines, epinephrine and norepinephrine, can result from acute and/or chronic stress, suggesting the need, as we do in the current study, to aggregate repeated measures over time to accurately gauge chronic levels. Multiple studies have used these catecholamines as biological indicators of chronic stress [3].

Additional measures at age 16. To strengthen the causal hypothesis outlined in our conceptual model, we selected additional measures assessed at age 16 to be treated as baseline control variables for each of the outcomes examined. No measures at age 16 were identical to the outcome measures, so we used conceptually similar, developmentally appropriate constructs. For alcohol use, we used a similar one-item measure of past-month alcohol use. For emotional self-regulation, we used youth-reported self-control as measured by eight items from the Children's Self-Control Scale [29] (Cronbach's alpha = .71). For college/university enrollment, we used youth's orientation to schooling as measured via the efficacy subscale of the Academic Orientation Scale that Conger [30] developed (Cronbach's alpha = .80). As no biological data were available from participants prior to age 19, no baseline control for epinephrine and norepinephrine was included.

The Supplementary Data contain a summary table of the waves each measure was collected and its respondent.

Results

Preliminary analyses

Latent growth curve models of family routines during adolescence indicated no significant mean change over time across all families (M = −.08 [SE = .04]; *p* = ns) and no significant variability between families in rate of change over time (σ^2 = .20 [SE = .12]; *p* = ns). Given these results, scores were averaged so that the resulting composite score indicated mean levels of routines between youth ages 16 and 18 years.

Table 1 displays descriptive statistics and bivariate correlations for the sample. Across all three waves, primary caregivers reported engaging in a mean of 4.77 of the seven routines assessed (SD = 1.56), with a median of five routines across. The bivariate correlations between family routines and developmental outcomes supported hypothesis testing and statistical modeling; overall, these associations were modest in magnitude, with the largest involving self-regulation. Measures included as baseline control variables were all correlated with their respective outcome. Missing data were minimal and were handled using full information maximum likelihood estimation. Models were run using Mplus 7.4 software (Muthén & Muthén, Los Angeles, CA) [31].

Table 1
Correlation matrix and descriptive statistics for study variables (N = 504)

	1	2	3	4	5	6	7	8	9	10	11	12	13
Outcomes													
1. Alcohol use	—												
2. Epinephrine	.12												
3. Norepinephrine	−.01	.54											
4. Self-regulation	−.13	.00	.06										
5. Emo. reactivity	.19	−.00	.02	−.53									
6. Hostility	.22	.07	−.01	−.57	.58								
7. Univ. enroll.[a]	.08	−.08	−.03	.19	−.13	−.13							
Predictors													
8. Family routines	−.14	−.10	−.04	.19	−.15	−.15	.14						
9. Supp. parenting	−.06	−.06	.01	.24	−.09	−.11	.15	.36					
10. Harsh parenting	.17	.02	.04	−.14	.14	.11	−.08	−.13	−.23				
11. Household chaos	.08	.02	.05	−.13	.15	.17	−.09	−.32	−.32	.33			
12. Family SES risk	−.09	.01	.07	−.10	.04	.09	−.23	−.02	−.07	.05	.18		
13. Sex[b]	.11	.31	−.05	−.07	−.11	.07	−.09	−.04	−.13	.00	.00	−.01	
M	2.17	6.81	37.36	54.97	16.26	14.41	.26	4.77	16.96	5.73	3.66	2.25	.46
SD	2.30	4.78	21.65	7.04	3.60	5.79	N/A	1.56	2.49	1.28	2.12	1.25	N/A
Percent missing	.00	.60	.60	.00	.00	.00	10.52	.00	.00	.00	.00	.00	.00

Descriptive statistics reflect pairwise deletion. Correlations | r | > .086 were significant at p < .05; correlations | r | > .121 were significant at p < .01.
N/A = not applicable to a dichotomous variable.
[a] Enrolled in, or graduate from, a 4-year college/university.
[b] Male.

Multivariate analyses

Given these preliminary analyses, we proceeded to construct a series of models in which alcohol use, epinephrine levels, emotional self-regulation, and university enrollment were predicted from successive blocks of variables: family routines, sociodemographic factors, and baseline control variables (Block 1), parenting variables (Block 2), and household chaos (Block 3). Alcohol use was measured as a zero-inflated Poisson distribution, given the overdispersion of zero values. Emotional self-regulation was modeled as a latent variable (all factor loadings $\lambda \geq .69$). Logistic regression was used for university enrollment.

Table 2 presents results of these analyses. For all four developmental outcomes, a consistent pattern emerged: family routines demonstrated significant effects across all outcomes above and beyond the effects of other variables included in the model, including baseline control variables. Specifically, with family SES risk, sex, and the available age 16 baseline measures controlled (i.e., Block 1), youth whose primary caregivers reported more family routines during adolescence reported less alcohol use during young adulthood and displayed lower epinephrine (but not norepinephrine) levels compared with youth from families with fewer reported routines. Family routines during adolescence were also associated positively with youth's emotional self-regulation and university enrollment in young adulthood. Odds ratios indicated that every unit of increase in number of family routines was associated with a 10% increase in the likelihood of 4-year university enrollment or graduation. A similar pattern of results appeared after the inclusion of supportive parenting and harsh parenting (Block 2), with family routines continuing to predict alcohol use, epinephrine levels, and emotional self-regulation. Further, after the addition of household chaos into the model (Block 3), significant effects of family routines were evident with respect to epinephrine levels and emotional self-regulation.

Significant effects associated with other predictors were sparse. With other variables in the model controlled, neither supportive parenting nor harsh parenting was associated with any other outcomes in young adulthood. For sociodemographic variables, family SES risk was negatively associated with youth's university enrollment at age 21 and, compared with young women, young men reported more alcohol use, evinced higher epinephrine levels, and were less likely to be enrolled at a 4-year college/university at age 21.

Moderation analyses were conducted following guidelines by Aiken and West [32]. A total of five moderators were examined: baseline levels of family SES risk, parental employment status, family structure, number of kids in the home, and household chaos. Nearly all interactions were nonsignificant.[1] Thus, these findings indicate that the effect of family routines on the four young adult outcomes were stable and did not vary as a function of examined sociodemographic characteristics or household chaos (tabulated results available from first author).

Discussion

Much of family life involves ordinary and repetitious activities: eating meals, doing household chores, getting ready for bed, and so forth. Although commonplace and, at times, seemingly trivial, the degree of predictability and consistency (or lack thereof) in everyday family life appears to have clear implications for adolescent development. From a 6-year prospective study with multi-informant, multilevel data, the current results substantiate the benefits of predictable family environments during adolescence for multiple outcomes in young adulthood for rural African-Americans. Notably, the salutary effects of parent-reported family routines during adolescence were documented across behavioral, physiological, psychosocial, and educational domains and were

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[1] The two interactions that demonstrated statistical significance were: (1) Family Routines × Parental Employment Status predicting epinephrine levels ($B = -0.88$; se = .33; $p < .01$); and (2) Family Routines × Household Chaos predicting norepinephrine levels ($B = 0.68$; se = .27; $p = .01$). Plots of these interactions, in general, indicated that family routines covaried more with their respective outcomes for families with an employed parent (for epinephrine) and with lower levels of household chaos (for norepinephrine). However, given the amount of moderation analyses conducted and lack of significant effects from other analyses, we do not elaborate on these results any further in order to avoid potential findings due to capitalization on chance.

Table 2

Main effects of family routines on young adulthood outcomes

	Model 1 (N = 504)			Model 2 (N = 501)				
	Alcohol use (ages 19–21)[1]			Epinephrine (ages 19–21)			Norepinephrine (ages 19–21)	
	B (se)	B (se)	B (se)	B (β) (se)	B (β) (se)	B (β) (se)	B (β) (se)	
	Block 1	Block 2	Block 3	Block 1	Block 2	Block 3	Block 1	Results of Blocks 2 and 3 not displayed given nonsignificant results from Block 1
Family routines (ages 16–18)	−.08** (.03)	−.06* (.03)	−.06 (.03)	−.28 (−.10)* (.13)	−.29 (−.10)* (.14)	−.29 (−.10)* (.14)	−.61 (−.04) (.62)	
SES risk (age 16–18)	−.06 (.04)	−.07 (.04)	−.07 (.04)	.03 (.01) (.16)	.03 (.01) (.16)	.03 (.01) (.16)	1.15 (.06) (.78)	
Youth sex[2]	.28** (.09)	.28** (.09)	.28** (.09)	2.94 (.31)** (.40)	2.95 (.31)** (.41)	2.95 (.31)** (.41)	−2.04 (−.05) (1.93)	
Baseline control (age 16)	.27** (.07)	.27** (.06)	.27** (.06)	—	—	—	—	
Supp. parenting (age 16–18)		−.01 (.02)	−.01 (.02)		.03 (.02) (.09)	.03 (.01) (.09)		
Harsh parenting (ages 16–17)		.07* (.03)	.06* (.03)		.03 (.01) (.16)	.03 (.01) (.16)		
Household chaos (ages 16–18)			.01 (.02)			−.04 (−.02) (.11)		

	Model 3 (N = 463)			Model 4 (N = 415)		
	Emotional self-regulation (ages 19–21)			University enrollment (age 21)[3]		
	B (β) (se)	B (β) (se)	B (β) (se)	Odds ratio (se)	Odds ratio (se)	Odds ratio (se)
	Block 1	Block 2	Block 3	Block 1	Block 2	Block 3
Family routines (ages 16–18)	.54 (.15)** (.17)	.44 (.13)* (.18)	.41 (.12)* (.18)	1.10* (.05)	1.08 (.05)	1.08 (.05)
SES risk (age 16–18)	−.25 (−.06) (.21)	−.22 (−.05) (.21)	−.19 (−.05) (.21)	.79** (.06)	.80** (.06)	.80** (.06)
Youth sex[2]	−.06 (−.01) (.53)	−.02 (−.00) (.53)	−.02 (−.00) (.53)	.83 (.15)	.84 (.15)	.84 (.15)
Baseline control (age 16)	.67 (.51)** (.07)	.65 (.49)** (.07)	.64 (.49)** (.07)	1.08** (.02)	1.08** (.02)	1.08** (.02)
Supp. parenting (age 16–18)		.14 (.06) (.12)	.12 (.05) (.12)		1.03 (.03)	1.04 (.03)
Harsh parenting (ages 16–17)		−.31 (−.07) (.21)	−.28 (−.06) (.21)		.96 (.05)	.95 (.05)
Household Chaos (ages 16–18)			−.10 (−.04) (.14)			1.01 (.04)

Abbreviations: RMSEA = root mean square error of approximation; CFI = comparative fit index; SRMR = standardized root mean square residual.

[1] Standardized parameters are not available because alcohol use was modeled as a zero-inflated Poisson distribution.

[2] Dichotomous variable (1 = male).

[3] Dichotomous variable (1 = currently enrolled in, or graduate from, 4-year university).

Model 1 was estimated using Monte Carlo integration algorithm with restricted maximum likelihood estimation given zero-inflated Poisson distribution. Models 2 was estimated using maximum likelihood estimation and was fully constrained (no model fit indices). *$p < .05$; **$p < .01$. Models 3 and 4 were estimated using maximum likelihood estimation. Model 4 was fully constrained (no model fit indices). Model 3 fit: Block 1: $\chi^2(7) = 30.429$ ($p < .01$). CFI = .96; RMSEA = .085, [.06, .12], SRMR = .027. Block 2: $\chi^2(11) = 45.89$ ($p < .01$). CFI = .94; RMSEA = .083, [.06, .11], SRMR = .028. * $p < .05$; ** $p < .01$. Block 3: $\chi^2(13) = 50.78$ ($p < .01$). CFI = .93; RMSEA = .079, [.06, .10], SRMR = .026. * $p < .05$; ** $p < .01$.

observed to be independent from the effects of SES risk, biological sex, and baseline control variables as well as, in most instances, supportive parenting, harsh parenting, and household chaos.

Findings from the current study highlight the developmental significance of family routines for adolescents in addition to young children, where most prior research has focused [7,33]. The present findings are also consistent with prior research suggesting the benefits of family routines on multiple domains of development, including psychological and physiological well-being [5]. Given emerging research indicating that excelling in areas of education, psychosocial adjustment, and behavior adjustment can come at a cost for minority youths' physical health [34], there is a clear need for future research that identifies processes that simultaneously promote psychological and physiological health. The present results suggest that a predictable, consistent family environment may represent such a construct.

The current results also have important implications for applied research and practice, particularly family-centered prevention endeavors. Traditionally, family-centered prevention programs have devoted little attention to family routines, focusing instead on cognitive-behavioral techniques common to parenting and couple-focused programs [35,36]. Both the current results and others [6], however, suggest that enhancing predictability in the family environment may be as influential on children's development as enriching family members' behaviors. In addition, for children residing in chaotic, unpredictable family environments, even well-designed cognitive-behavioral interventions may be ineffective without first addressing instability in the home [37]. Recent applied research efforts focused on modifying household routines to promote children's health behaviors have documented increases in sleep duration and decreases in television viewing among young children [38].

Future research is needed to investigate mechanisms through which family routines exert this effect in young adults, as well as for whom the effect of family routines is more (or less) pronounced. Although multiple studies have considered family routines as mediators linking some aspect of parenting or parent well-being to child functioning [11,12], less empirical attention has been given to the mechanisms through which routines exert this effect. In theorizing for young children, parental efficacy, behavior monitoring, and coherence of family relationships have been suggested as potential mechanisms [7]. Given writing on the effects of family routines on planning, future orientation, and schemas of caregivers' trustworthiness [39,40], we speculate that at older ages, personal routines, delay discounting, and willingness to seek out instrumental and emotional support from family members are pertinent constructs for consideration in future research on mechanisms through which family routines exert this effect. Future research can also consider factors that account for family routines' prediction of variability in levels of epinephrine, but not norepinephrine. Because the effects of epinephrine are brought about by the adrenal medulla, whereas norepinephrine effects are brought about by the sympathetic nervous system, these results may suggest that family routines more directly shape adrenal activity than the sympathetic nervous system.

Several limitations of the study should be addressed in future research. First, family routines were not assessed prior to youth age 16, precluding examinations of the effect of routines at earlier developmental stages. Second, the lack of observational data limits cross-validation of self-report responses. Third, although statistical models controlled for earlier levels of most outcomes, causality cannot be empirically confirmed given the lack of experimental randomization. These limitations notwithstanding, the results of this study demonstrate the unique predictive significance of family routines during adolescence for rural African-Americans' developmental outcomes and provide empirical support for increasing attention to family routines in basic and applied research designed to promote child and family well-being.

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