

A Life History Assessment of Early Childhood Sexual Abuse in Women

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Life history theory provided a framework for examining the relations among child sexual abuse (CSA), childhood adversity, and patterns of reproductive development and behavior. A community survey that assessed CSA, life history variables (e.g., age of menarche), and social and family background was administered to 623 women (mean age = 26.9 years). Independent of social and family background, CSA was associated with earlier age of (a) menarche, (b) first sexual relationship, (c) desire to have children, (d) first childbirth, and (e) lower self-evaluated physical attractiveness. Cluster analyses revealed different patterns of experiential correlates of reproductive development within the group of abused women, suggesting CSA may operate in combination with other childhood circumstances to modify the timing and pattern of individual maturation.

Keywords: child development, child sexual abuse, menarche, life history theory, evolution

Child sexual abuse (CSA) is experienced by as many as one in three girls in the United States (Finkelhor, 1987) and is a risk factor for anxiety, mood, and personality disorders and lower overall physical, emotional, and social well-being (e.g., Molnar, Buka, & Kessler, 2001; Steel, Sanna, Hammond, Whipple, & Cross, 2004). Recent studies suggest that CSA is also associated with earlier pubertal onset (Brown, Cohen, Chen, Smailes, & Johnson, 2004; Herman-Giddens, Sandler, & Friedman, 1988; Romans, Martin, Gendall, & Herbison, 2003; Trickett & Putnam, 1993; Turner, Runtz, & Galambos, 1999), earlier sexual activity (Hotte & Rafman, 1992), and risk for teenage pregnancy (Brown et al., 2004; Herrenkohl, Herrenkohl, Egolf, & Russo, 1998), as well as an older subjective age (Turner et al., 1999). The pattern suggests that CSA may result in hastened reproductive maturation in girls.

In the current article, we propose a life history model for conceptualizing how and why CSA and other adverse childhood experiences may modify the timing of reproductive development and behaviors. Life history research is focused on determining the evolutionary and proximate influences on individual differences in reproductive pattern and expression, as related to heritable and social and ecological influences (see Charnov, 1993). Childhood sexual abuse is of particular interest because of the potential relation between CSA and early sexual development and for reasons described in the following sections. In these sections, we also

review theory and research on proximate social influences on the timing of expression and pattern of reproductive development.

Evolution of Childhood

Function of Childhood

From a life history perspective, the length of human childhood evolved to allow children the opportunity to practice and refine the physical, behavioral, and social traits that enhanced survival and reproduction during human evolution, such as parenting skills and their ability to compete for status, resource control, and preferred mates in adulthood (e.g., Alexander, 1987; Geary, 2002). The combination of these traits determines individuals' *reproductive potential*. In theory, the longer the childhood, the greater the opportunity to accrue reproductive potential before actual reproduction. However, delayed reproduction carries the potential cost of death before having the opportunity to reproduce (Chisholm, 1993), and for women, delayed reproduction reduces the overall length of the reproductive life span (Menken, Trussell, & Larsen, 1986). These cost–benefit trade-offs create the potential for the evolution of phenotypic plasticity in the timing of the expression of individual maturation (see also Geary, 2002). Accompanying this plasticity are social and ecological cues that modify reproductive timing such that the transition from childhood to adulthood (hereafter referred to as *reproductive debut*) occurs when the potential costs of delay outweigh the potential benefits of further delay. The family, the wider kin group (Geary & Flinn, 2001), and peers (Harris, 1995) represent the primary social contexts in which development occurs and thus are the arenas in which human childhood evolved and in which the cues that influence the phenotypic expression of reproductive debut should be found.

Early Social Experiences

Several social and experiential correlates of the age of expression of three core life history traits—age at menarche, age at sexual initiation, and age at first childbirth—are provided in Table 1. The pattern of relations described in Table 1 suggests that the transition

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We thank Patricia Vigil for her support and contributions to this work; Mary Hoard for assistance in constructing the survey; and Amanda Rose, Charles Borduin, and Mark Flinn for suggestions on a draft of this article. The research was supported in part by a Gus T. Ridgel Graduate Fellowship awarded to Jacob M. Vigil.

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Table 1
Social Correlates of Three Life History Traits

Trait	Source
Early menarche	
Adolescent depression, intrafamilial conflict	Kim & Smith, 1998
Less paternal caregiving, father absence	Ellis, McFadyen-Ketchum, Dodge, Pettit, & Bates, 1999; Romans, Martin, Gendall, & Herbison, 2003
Parental education	Hulanicka, 1999
Parental psychopathology, exposure to unrelated males	Ellis, 2002
Greater number of siblings	Hoier, 2003
Younger age at first sexual intercourse	
Earlier menarche and self-reported depression	Kim & Smith, 1998
Older subjective age and autonomy from parents	Rosenthal, Smith, & de Visser, 1999
Less educational proficiency and parent's academic expectations	Schvaneveldt, Miller, Berry, & Lee, 2001
Instability of intact nuclear (i.e., biological) families	Wu & Thomson, 2001
Parental education	Pedersen, Samuelsen, & Wichstrom, 2003
Peer norms	Rucibwa, Modeste, Montgomery, & Fox, 2003
Younger age at first childbirth	
Low self-esteem	Herrenkohl, Herrenkohl, Egolf, & Russo, 1998
General socioeconomic disadvantage	Geronimus, 1991
High local mortality rates	Bereczkei & Csanaky, 2001

Note. The heritability (h^2) of life history traits ranged from .51 for age at menarche to .21 for age at first childbirth (see Kirk et al., 2001; Rowe, 2002), indicating that at least half of the variance associated with reproductive timing may be attributable to variation in individuals' social experiences, such as child sexual abuse.

from childhood to adulthood is correlated with myriad individual (e.g., educational proficiency), familial (e.g., father absence), peer (norms), and other (e.g., local life expectancy) social experiences and most generally with disadvantages in terms of parental availability, education, and income (Ellis, McFadyen-Ketchum, Dodge, Pettit, & Bates, 1999; Wu & Thomson, 2001). Disadvantages in terms of self-evaluation (Herrenkohl et al., 1998) and low levels of communitywide resources (Geronimus, 1991) are also associated with earlier reproductive debut. With respect to phenotypic plasticity, the availability of familial and wider resources that can enhance individual reproductive potential may cue the expression of biological mechanisms that delay maturation—for instance, by providing the individual with resources that will increase their attractiveness and allow for more successful competition over preferred mates in adulthood. In contrast, low levels of familial and wider community resources may cue reduced ability to add to reproductive potential and thus lower relative benefits to delayed maturation.

In this sense, negative childhood experiences are stressful, in part because they signal *reduced opportunity* to accrue reproductive potential, thereby restricting individuals' reproductive options (e.g., potential mating partners) and/or competencies (e.g., parenting) in adulthood. By the same analyses, the availability of resources in childhood (e.g., parental investment in children's education) is experienced as positive (e.g., affectively) because these enhance the opportunity to add to reproductive potential. In any case, for most individuals there may be both negative (i.e., cuing early development) and protective (i.e., cuing later development) influences that modify the timing and pattern of reproductive development.

Childhood Sexual Abuse

Childhood experiences that signal reduced opportunity to accrue reproductive potential and thus reduced benefits to delay reproduction are predicted to covary with earlier reproductive debut. Childhood sexual abuse may signal reduced opportunity in several ways. First, the experience of CSA implies reduced parental or kinship investment, and a failure to protect the girl from sexual exploitation may signal an unwillingness or an inability to provide this investment. Second, considerable evidence shows that CSA lowers women's appraisals of self-worth, appreciation of their body image, and general self-esteem (e.g., Trickett & Putnam, 1993). As in adult rape, CSA circumvents victims' mate choice (Thornhill & Palmer, 2000) and violates victims' sense of chastity, a trait that influences men's mate preferences (see Geary, Vigil, & Byrd-Craven, 2004) and that is highly cherished by women (Mitchell & Wellings, 1998). If CSA results in the implicit sense of reduced value as a potential long-term mate, then this form of exploitation is predicted to influence women's self-evaluation, especially in terms of traits that men consider in their choice of long-term mates, such as physical attractiveness (Geary et al., 2004; Li, Bailey, Kenrick, & Linsenmeier, 2002). In addition, CSA may psychologically and physiologically signal the beginning of reproductive debut through the experience of sexual activity and thus may hasten reproductive development.

Current Project

From a life history perspective, CSA may lower a victim's reproductive potential and thus hasten maturational development. More precisely, because individual reproductive debut comprises physiological, behavioral, and psychological indicators of maturation,

tion, CSA is predicted to be associated with earlier age at (a) menarche onset, (b) first sexual experience (discounting the abuse), (c) first childbirth, (d) subjective desire to have children, and (e) perceived readiness to take on parental obligations. The age of expression of these traits is also predicted to be influenced by indicators of parental investment (e.g., educational encouragement), wealth, and communitywide resources, in addition to CSA. On the basis of men's mate preferences, adult victims of CSA are predicted to report more negative evaluations of their physical appearance than are nonabused adults and to evaluate their physical appearance more negatively than they would other aspects of their self-image.

Method

Participants

The current study is based on a larger assessment of mating strategies in a demographically diverse sample of American women from communities in two U.S. regions: several rural and suburban mid-Missouri towns ($n = 418$) and the southwestern city of Albuquerque, New Mexico, and surrounding towns ($n = 205$). In Missouri and New Mexico, women were recruited from various community locations, such as city libraries, recreational parks, and participants' private residences (door to door). Prospective participants who appeared to be between 18 and 50 years of age were solicited to complete a survey that explored "women's relationships." They were assured of their rights of confidentiality and were told that they would receive \$5 for their participation. Participants took between 10 and 30 min to complete the survey and were then paid and debriefed. The participants were instructed not to put their name anywhere on the survey and to place it in a large envelope with other surveys when finished.

The final sample consisted of 623 participants (ages 18–56 years; $M = 26.9$, $SD = 8.5$). The racial composition of the sample was heterogeneous (40% European American, 27% African American, 21% Latin American, 4% Asian American, 4% Native American, and 4% "other" or biracial), and the average income of the participants was low, with the mean yearly income under \$10,000 and the modal yearly income between \$0 and \$5,000 (measured categorically). Over 53% of the sample reported that they were currently receiving some form of governmental financial assistance (e.g., food stamps, Medicare, etc.). The average educational level was 12.5 years ($SD = 2.4$) and ranged from fourth grade to advanced graduate degrees.

Measures

The measure was a self-report questionnaire designed to assess a wide range of traits and issues, including personal (e.g., socioeconomic status [SES], racial background) and developmental (e.g., parental SES) background, family-of-origin relationships (e.g., parent-child arguments), sexual abuse experience, self-image assessments, and life history traits.

Early experiences. These items were designed to assess different aspects of parental SES, parental investment, family dynamics (e.g., parental and parent-child conflicts), and encouragement of college attendance. Parental SES items pertained to parents' educational level, income, history of governmental financial assistance, and material luxuries; parental investment was measured by the amount of time spent with fathers, having a father co-parent, and number of siblings; and family conflict was measured on the basis of reported level (on a 5-point scale) of parent-parent and parent-child conflict. The survey also included an item on estimates of community income ranges during childhood; this provided an index of the economic and thus social-competitive context within which the family-of-origin was situated.

CSA experiences. Although the classic literature includes varying age and assessment criteria for CSA (Finkelhor, 1987), in the present assessment we refer for two reasons to any acts of CSA that occurred before a girl was 14 years of age. First, Kendall-Tackett and Simon (1988) reported that the average age at onset and cessation of CSA was 7.5 years and 13 years, respectively. Second, a cutoff age of 14 years ensured that CSA occurred before full sexual maturation. Another area of methodological consideration concerns the validity of self-report techniques when assessing CSA experiences. For instance, Lange et al. (1999) found that women are quite willing to discuss CSA through self-disclosure questionnaires—perhaps even more so through this method than through face-to-face interviews (e.g., see Tang, 2002). In addition, assessments of self-report surveys and in-depth interview techniques demonstrate considerable consistency between the two methods, whereby discrepant biases typically reveal a more conservative prevalence with the former method (Dill, Chu, Grob, & Eisen, 1991). Given these considerations, we assessed CSA by means of the following single item: "I was sexually abused before age 14" (yes or no). Similar techniques have been used elsewhere (e.g., Wilsnack, Wonderlich, Kristjanson, Vogeltanz-Holm, & Wilsnack, 2002) and have ensured minimal intrusion on the participants' confidentiality while capturing women's subjective interpretation of CSA.

Life history variables. Previous assessments of women's self-disclosed, retrospective accounts of various life history traits (e.g., age at menarche) suggest that these events are reliably and validly recalled (Must et al., 2002; Romans et al., 2003). For example, Must et al. demonstrated that over 79% ($n = 448$) of women accurately recalled (within 1 year) their previously documented age at menarche an average of 29 years later. In the current study, participants were asked to respond (in terms of age) to the following items: "I got my first period when I was (___) years old"; "I was (___) years old when I first had sexual intercourse"; "My age at the birth of my first child was (___)"; "I felt the DESIRE to have children when I was (___) years old"; "I felt I was READY to have children when I was (___) years old."

Self-image assessments. Participants were asked to rate themselves on four personal qualities ("looks," "kindness," "intelligence," and "talent") that are consistent with traditional measures of self-image (Palazzi, De Vito, Luzzati, Guerrini, & Torre, 1990). For each quality, participants were asked to indicate their self-evaluative assessments on an interval scale, ranging from 1 (*low*) to 5 (*high*), during elementary school and as a teenager.

Reliability

Using a sample of 36 undergraduate women in a classroom setting, we assessed test-retest reliability (4 weeks apart) for items used in the following analyses. The test-retest correlation for the occurrence ($n = 4$) or not ($n = 32$) of CSA was .85. At the time of the first measurement, 3 of the 36 women reported CSA, and at the second assessment, these women and a fourth woman reported CSA. The remaining 32 women indicated at each assessment that they had not experienced CSA. The test-retest correlations for the core life history traits (i.e., menarche, first sexual intercourse, and first childbirth) ranged from .91 to .99 and were acceptable, as were those for the age of first desire to have children (.78) and first readiness to have children (.74). Test-retest correlations for the self-evaluation items (i.e., looks, kindness, intelligence, and talent) ranged from .60 to .85. The remaining test-retest correlations for the demographic and early family relations items were also acceptable and ranged from .37 to .99.

Results

The results are presented in four sections. In the first, we examine the relations among the life history traits; and in the second and third, we contrast life history timing and self-

evaluations, respectively, for women who reported CSA and those who reported no such abuse. We used cluster analyses in the final section to assess childhood correlates (e.g., parental investment) of reproductive development and behavior for the women who reported CSA.

Relations Among Life History Traits

The correlations among and the mean ages for the five life history traits are shown in Table 2. Age of menarche showed significant ($ps < .05$) but low-to-moderate correlations with all other traits except age of readiness for children ($p > .05$). The two psychological traits were moderately correlated, as were age at first sexual intercourse and age of first childbirth. The patterns of correlations suggest both common and unique influences on the age of expression of these life history traits.

CSA, Reproductive Development, and Childhood Background

To test the hypothesis that CSA results in an earlier onset of each of the life history traits, we split the sample into two groups: women who reported CSA ($n = 152$) and those who reported no CSA ($n = 464$); 7 participants did not respond to the CSA item. As shown in Table 3, the CSA group reported an earlier age of onset for all five life history traits ($ps < .01$). It is also clear from the relations shown in Table 3 that the CSA group was disadvantaged on all of the childhood SES variables ($ps < .05$): They reported lower levels of parental investment (e.g., degree of father involvement) and higher levels of parent-child and parent-parent conflict ($ps < .001$), and they differed on several personal traits (e.g., ease of making new friends).

Next, setwise regression equations (whereby all of the variables in the conceptual set, e.g., family dynamics, were entered simultaneously) were used to estimate the relation between CSA and the life history variables while controlling for the sets of childhood SES variables, family characteristics variables, and personal traits, respectively. For each of the five life history traits, we performed four analyses. In the first three, CSA was simultaneously entered as a predictor variable along with each of the three respective sets of category variables (i.e., childhood SES, familial characteristics, and personal traits). In the final analysis, CSA was simultaneously entered as a predictor variable along with all of the variables that showed a significant or near-significant ($p < .10$) relation with any of the life history traits in the first three analyses. The inclusion of near-significant predictors in this last analysis ensured a more conservative assessment of the relation between CSA and the

life history variables. For all analyses, the life history and predictor variables were standardized ($M = 0, SD = 1$).

The results for the set of childhood SES variables revealed that CSA was associated, above and beyond the influence of reported childhood SES variables, with significantly ($ps < .05$) earlier age of onset for four of the five life history traits: menarche, $t(347) = -3.35, p < .01, \beta = -.19$; first sex, $t(316) = -3.15, p < .01, \beta = -.18$; first desire, $t(271) = -2.70, p < .01, \beta = -.17$; and first childbirth, $t(169) = -2.53, p < .05, \beta = -.19$. CSA was associated with an earlier age of onset for the first readiness trait, but this difference was not statistically significant, $t(228) = -1.80, p < .10, \beta = -.12$. The reported childhood SES variables were not as consistently related to the life history traits as CSA. Among the relations that were significant, community income was associated with later age at first sex, $t(316) = 2.49, p < .05, \beta = .16$, and higher familial resources (buying a new car) was associated with later desire to have children and later age at first childbirth, $t(271) = 2.57, p < .01, \beta = .17$, and $t(169) = 2.51, p < .05, \beta = .21$, respectively. Father's and mother's education were also related to later age at childbirth, $t(169) = 2.41, p < .05, \beta = .19$, and later age at readiness to have children, $t(228) = 3.15, p < .01, \beta = .24$, respectively. Because the predictors were entered as a set, each of the significant relations indicated independent influences, in addition to the variance accounted for by the other predictors, such as CSA.

The same pattern is evident among the family characteristics variables: CSA was associated, above and beyond reported family dynamics, with earlier age at menarche, $t(548) = -4.29, p < .01, \beta = -.20$; first sex, $t(508) = -4.88, p < .01, \beta = -.22$; first desire, $t(432) = -2.20, p < .05, \beta = -.11$; first readiness, $t(374) = -2.46, p < .05, \beta = -.13$; and first childbirth, $t(305) = -2.84, p < .01, \beta = -.17$. Among significant family characteristics, parent's encouragement of college attendance was independently associated with later age at first sex, $t(508) = 2.00, p < .05, \beta = .09$, and having fewer siblings was independently associated with later menarche, $t(548) = 2.50, p < .05, \beta = .11$. Age at mother's first childbirth was independently associated with later age at first sex, $t(508) = 3.45, p < .01, \beta = .16$; first readiness, $t(374) = 4.79, p < .01, \beta = .25$; and first childbirth, $t(305) = 4.51, p < .01, \beta = .26$.

With respect to the personal characteristics, CSA was independently related to earlier menarche, $t(581) = -3.69, p < .01, \beta = -.16$; first sex, $t(524) = -4.27, p < .01, \beta = -.18$; first desire, $t(450) = -2.42, p < .05, \beta = -.12$; first readiness, $t(390) = -3.02, p < .01, \beta = -.16$; and first childbirth, $t(319) = -2.62, p < .01, \beta = -.15$. Being overweight during childhood was associated with earlier menarche, $t(581) = -3.33, p < .01, \beta = -.14$, and later, with first desire, $t(450) = 2.28, p < .05, \beta = .11$; having health problems was associated with earlier age at first sex, $t(524) = -2.93, p < .01, \beta = -.12$. It is interesting that ease at making new friends during childhood was associated, above and beyond the other personal characteristics, with earlier menarche, $t(581) = -3.14, p < .01, \beta = -.17$; first readiness, $t(390) = -2.89, p < .01, \beta = -.19$; and first childbirth, $t(319) = -1.98, p < .05, \beta = -.15$. Later menarche was also associated with later age at first sex, $t(524) = 3.43, p < .01, \beta = .14$. Ethnic effects were estimated with dummy-coded contrasts between the White group and the other groups. Relative to the White participants, the Asian participants reported a later age of first sex, $t(524) = 6.81,$

Table 2
Mean Ages and Correlations Among Life History Traits

Life history (in years)	<i>M</i>	<i>SD</i>	1	2	3	4	5
1. Menarche	12.53	1.78	—				
2. First sex	16.10	2.76	.15**	—			
3. First desire for children	19.20	4.69	.09*	.35**	—		
4. Felt ready for children	21.09	4.91	.05	.32**	.64**	—	
5. First childbirth	19.46	4.00	.12*	.42**	.49**	.65**	—

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

Table 3
Life History Outcomes and Childhood Characteristics for CSA and Nonabused Groups

Variable	CSA group		Nonabused group		<i>t</i>	<i>df</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Outcome traits						
Age at menarche	12.07	1.84	12.68	1.73	3.71**	606
Age at first sexual intercourse	14.85	2.94	16.55	2.54	6.27**	232
Age at desire for children	17.95	4.89	19.63	4.56	3.52**	480
Age at readiness for children	19.91	5.11	21.56	4.77	3.12**	416
Age at first childbirth	18.50	3.02	19.93	4.35	3.52**	303
Childhood SES						
Child's community income (\times 10k/year)	3.48	2.07	4.23	2.27	3.16**	487
Parents' governmental financial assistance ^a	53%	0.50	27%	0.44	-5.75**	537
If parents ever bought a new car	51%	0.50	71%	0.46	4.32**	565
If parents owned their own home	45%	0.50	64%	0.48	3.74**	527
Fathers' education level	12.10	2.98	12.94	3.30	2.49*	509
Mothers' education level	11.87	2.82	12.74	2.93	3.02**	551
Family characteristics						
Parents talked about going to college ^a	56%	0.50	76%	0.43	4.54**	223
Age at mother's first childbirth	19.40	3.23	20.90	4.29	4.47**	324
Number of siblings	3.45	2.30	2.65	1.90	-3.91**	222
Father listed as a caretaker ^a	43%	0.50	64%	0.48	4.60**	612
Degree of father involvement (0-4)	1.61	1.37	2.49	1.34	6.93**	607
Parent-child arguments (0-4)	1.97	1.10	1.59	1.00	-4.00**	610
Parent-parent arguments (0-4)	2.15	1.21	1.55	1.02	-5.49**	221
Personal traits						
Overweight as a child ^a	24%	0.43	21%	0.41	<1	610
Major health problems as a child ^a	19%	0.40	5%	0.23	-4.05**	184
Number of friends (0-3)	2.03	0.94	2.46	0.78	4.98**	220
Ease in making new friends (1-5)	3.63	1.27	4.03	1.10	3.44**	228
Race (% of non-Hispanic Whites)	56%	0.49	62%	0.49	1.30	604
Childhood looks (1-5)	2.70	1.13	3.04	0.99	3.57**	605
Childhood kindness (1-5)	3.89	1.06	4.02	0.98	1.38	607
Childhood intelligence (1-5)	3.59	1.16	3.83	0.95	2.32*	221
Childhood talent (1-5)	3.13	1.29	3.46	1.13	2.76**	229

Note. CSA = childhood sexual abuse; SES = socioeconomic status.

^a Measured as a dichotomous variable; thus, the mean can be considered as a proportion of positive response.

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

$p < .01$, $\beta = .28$, and first desire to have children, $t(450) = 2.85$, $p < .01$, $\beta = .13$. Hispanic participants reported an earlier age at feeling ready to have children, $t(390) = -2.31$, $p < .05$, $\beta = -.12$; no other ethnic contrasts were significant.

The results for the final analysis confirm the relation between CSA and the life history traits, as shown in Table 4. In addition, many of the life history traits were associated with indicators of parental investment or competency and with community wealth. Higher reported community income was associated with later age at first sexual intercourse and first childbirth, whereas higher reported levels of parent-child conflict were associated with earlier age at first sexual intercourse and earlier age at first desire to have children.

CSA and Self-Evaluations

A mixed analysis of variance (ANOVA) with CSA as a between-groups factor and self-evaluated childhood variables

(looks, kindness, intelligence, and talent) as a within-group factor was performed to test the prediction that CSA would specifically affect victims' self-evaluated childhood "looks." The results revealed a significant effect for group, $F(1, 604) = 13.10$, $p < .01$, and evaluation type, $F(3, 1812) = 150.70$, $p < .01$, but the predicted interaction between group and evaluation type was not significant, $F(3, 1812) = 1.61$, $p > .10$. However, because the four self-image traits were significantly correlated (ranging from .24 to .58, $p < .05$) and based on our a priori hypothesis, we used a series of four simultaneous multiple regression analyses to further test the relation between CSA and self-evaluated childhood traits. In each analysis, CSA was entered as a predictor of one of the rated traits (e.g., looks), along with the three other self-image variables. The results revealed that CSA was associated, above and beyond the correlations between looks and the three other self-evaluation variables, with lower self-evaluated looks, $t(605) = -2.17$, $p < .05$, $\beta = -.07$. In contrast, CSA was not related to self-evaluated

Table 4
Relation Between Significant Childhood SES, Family, and Personal Predictors of Five Life History Traits, and Child Sexual Abuse

Predictor variable	Criterion variables	
	β	t
Menarche		
Parents talked about college	-.06	-1.41
Number of siblings	.09	2.13**
Overweight	-.13	-3.21**
Number of friends	.11	2.01*
Ease of making friends	-.16	-3.12*
Sexual abuse	-.18	-4.28**
First sexual intercourse		
Average community income	.13	2.64**
Parents talked about college	.04	< 1.00
Age at mother's first childbirth	.09	1.85
Parent-child conflict	-.09	-1.83
Health problems	-.08	-1.62
Menarche	.12	2.69**
Asian contrast	.22	4.79**
Sexual abuse	-.15	-3.08**
First desire		
Bought a new car	.14	2.88**
Parent-child conflict	-.12	-2.58*
Overweight	.10	2.07*
Asian contrast	.12	2.62**
Sex abuse	-.11	-2.29*
First readiness		
Mother's education	.20	3.47**
Age at mother's first childbirth	.17	3.13**
Ease of making friends	-.16	-3.09**
Self-evaluated intelligence	.06	1.22
Hispanic contrast	-.04	-0.77
Sexual abuse	-.13	-2.46*
First childbirth		
Average community income	.15	2.10*
Bought a new car	.11	1.65
Father's education	.19	2.81**
Age at mother's first childbirth	.23	3.49**
Ease of making friends	-.12	-1.84
Self-evaluated kindness	.09	1.43
Sexual abuse	-.17	-2.65**

Note. SES = socioeconomic status.
 * $p < .05$. ** $p < .01$.

kindness, intelligence, or talent once the three other self-evaluation items were controlled.

We used the same procedure to assess the relation between CSA and participants' teenage assessments. Once again, a mixed ANOVA revealed significant effects for group, $F(1, 602) = 12.10$, $p < .01$, and evaluation type, $F(3, 1806) = 57.80$, $p < .01$, and a nonsignificant interaction, $F(3, 1806) < 1$, $p > .10$. Initial multiple regression analyses indicated that CSA was not related to participants' self-reported teenage looks, $t(603) = -.65$, $p < .52$, $\beta =$

$-.02$, after controlling for teenage kindness, intelligence, and talent. However, the relation between CSA and self-evaluated teenage looks may have been confounded by additional variables associated with heterosexual relationships; in particular, we assumed that relationships with boys may increase self-evaluated looks. When age at first sexual intercourse (an indicator of heterosexual relationships) was entered as an additional predictor, the relation between CSA and teenage looks was significant, $t(553) = -2.23$, $p < .03$, $\beta = -.08$. As before, CSA experience did not independently predict teenage kindness, intelligence, or talent after controlling for each of the remaining three self-image variables ($p > .10$), whether or not age at first sexual intercourse was entered as an additional predictor.

Cluster Analysis

To explore if life history patterns differed within the CSA group, we used a *K*-means cluster analysis to create nonoverlapping groups that maximized within-cluster homogeneity. Cluster profiles were assessed with the three life history variables that are likely to have been recalled with the greatest accuracy: age at menarche, age at first sexual intercourse, and age at first childbirth. Initial analyses indicated, on the basis of cluster size and associated *F* tests, that a five-cluster solution provided a clear separation of groups. However, two of the five clusters consisted of small numbers of participants ($n = 6$ and $n = 2$) and thus were dropped.

As shown in Table 5, the three remaining clusters showed distinct life history patterns and were labeled *early maturers*, *moderate maturers*, and *late maturers*. Comparison of the three CSA groups and the nonabused group in terms of mean ages for the life history traits revealed significant ($p < .01$) differences for menarche, first sexual intercourse, age at first childbirth, and individuals' reproductive delay (the time lapse between menarche and age at first childbirth). Follow-up tests using a Bonferroni correction ($p < .05$, $c = 4$) revealed that the early maturers reported an earlier age of onset for each of these life history traits than did the nonabused participants, whereas the sexually abused moderate maturers only differed from the nonabused participants on age at first childbirth and reproductive delay. In contrast, the sexually abused late maturers reported a later age at first childbirth and longer reproductive delay than did the nonabused participants. It is important to note that among the CSA groups, the reproductive delay reported by the late maturers was over twice as long as that of the early maturers.

Among the CSA victims, different patterns of childhood experiences were reported across the three clusters. Examination of individuals' childhood experiences revealed group differences on time spent with father, $F(2, 139) = 4.11$, $p < .02$; mother's age at her first childbirth, $F(2, 134) = 7.05$, $p < .01$; whether parents talked to them about going to college, $F(2, 139) = 3.36$, $p < .04$; and whether their parents were able to afford a new car during childhood, $F(2, 130) = 3.43$, $p < .04$. Follow-up tests ($c = 3$) revealed that late maturers were significantly ($ps < .05$) more likely than early maturers to report that they had spent more time with their fathers, that mothers had been older at first childbirth, and that their parents had talked with them about going to college. The moderate maturers were more likely than the early maturers to report that their parents had bought a new car. Examination of individual differences on mother's educational attainment revealed

Table 5
Life History Traits of Three CSA Cluster Profiles and Nonabused Women

Group	<i>n</i>	Age at menarche	Age at first sexual intercourse	Age at first childbirth	Reproductive delay (in years)
Nonabused CSA	464	12.68 _a	16.55 _a	19.93 _a	7.17 _a
Early maturers	48	11.15 _b	12.72 _b	16.03 _b	4.90 _b
Moderate maturers	53	12.83 _a	16.02 _a	17.88 _b	5.26 _b
Late maturers	43	11.98 _{a,b}	17.06 _a	22.56 _c	10.40 _c

Note Reproductive delay refers to time lapse from menarche to age at first childbirth. Different subscripts indicate significant mean differences. CSA = child sexual abuse.

a trend for group differences in the expected direction: $F(2, 124) = 2.66, p < .07$ (for early maturers, $M = 11.56, SD = 2.57$; for moderate maturers, $M = 11.28, SD = 2.52$; for late maturers, $M = 12.60, SD = 3.15$). In comparison with the nonabused participants, only the early and moderate maturers reported significantly less time spent with their fathers during childhood, a younger age at mother's first childbirth, and parents who did not talk with them about going to college. With regard to their parents ever having bought a new car, only the early maturers significantly differed from the nonabused participants; the early maturers were less likely to report this.

Finally, examination of the current circumstances of the CSA groups revealed differences in income level, $F(2, 138) = 4.30, p < .02$; likelihood of being on some sort of government financial assistance, such as welfare, $F(2, 138) = 4.44, p < .01$; educational attainment, $F(2, 139) = 7.98, p < .01$; number of pregnancies, $F(2, 140) = 6.87, p < .01$; and number of children, $F(2, 140) = 4.54, p < .01$. Follow-up tests revealed that the early maturers compared with the late maturers reported significantly lower incomes, greater likelihood of being on financial assistance, lower educational levels, and having had more pregnancies and children.

Discussion

The current study approached the timing of expression of reproductive development in the context of the evolutionary extension of childhood (Bogin, 1999), the associated cost–benefit trade-offs that accompany individuals' opportunity to accrue reproductive potential before adulthood (Alexander, 1987; Geary, 2002), and earlier or later maturation. We proposed that CSA may cue low levels of parental and kinship investment, reduced family protection, and/or violate female victims' sense of attractiveness (i.e., by influencing their perceived chastity), resulting in reduced opportunity to accrue reproductive potential and reduced benefit to delay maturation.

With the method used in the current study, we were not able to explicitly link CSA to assessments of parental and kinship investment during childhood, but we were able to assess the more general prediction that CSA will be associated with earlier reproductive development and an earlier onset of reproductive behavior. Consistent with this hypothesis and previous research (e.g., Brown et al., 2004; Romans et al., 2003), CSA was related, above and beyond reported childhood SES characteristics and family dynamics, to an earlier age of onset for all of the physical, behavioral, and psychological life history traits we assessed. As a group and in

comparison to women who reported no CSA, CSA victims experienced menarche about 6 months earlier, began sexual relationships more than 1½ years earlier, and had their first child nearly 1½ years earlier. The cluster analyses suggested that earlier reproductive debut was especially pronounced for women who experienced CSA in combination with other forms of childhood adversity (e.g., less time spent with fathers) and that higher levels of parental and economic support may be protective factors that mitigate the influence of CSA on reproductive development and behavior. Even with higher levels of parental and economic support, the later maturing CSA victims reported an age of menarche that was nearly 8½ months earlier than the age reported by the nonabused women.

Although the relations were not as consistent as those associated with CSA, higher levels of reported family (e.g., bought a new car) and community (average community income) resources were associated with later reproductive debut, as predicted, whereas higher levels of parent–child conflict were related to earlier age at first sexual intercourse and age at first desire to have a child (for similar findings, see Rucibwa, Modeste, Montgomery, & Fox, 2003). In all, the parental, community, and family dynamic variables were correlated with the behavioral (e.g., age at first sexual intercourse) and psychological (e.g., age at first desire to have a child) components of reproductive debut but not with age of menarche once CSA was controlled.

Finally, we predicted that CSA may negatively influence girls' and women's self-evaluation, especially as related to traits that are linked to men's mate choices—in particular, physical attractiveness. In keeping with this prediction, CSA was associated with lower self-evaluated looks in childhood and during the teenage years but was not related to self-evaluated kindness, intelligence, or talent. These later findings are consistent with the thesis that CSA lowers victims' sense of attractiveness and are in keeping with other research that shows a relation between self-evaluations, attributional styles, and the psychological distress that accompanies CSA (Steel et al., 2004).

The present findings, though provocative, should be considered with caution because of the retrospective nature and self-report source of CSA experience. Such methodological considerations are the subject of current debate (e.g., see Kendall-Tackett & Becker-Blease, 2004) and may have affected our results through recall bias (see Widom, Raphael, & DuMont, 2004) and the use of a single-item criterion to identify abuse victims, as this may contribute to misinterpretation (e.g., regarding the definition of

sexual abuse), inconsistencies (because of the subjectivity of this item), and lower response rate. Moreover, the correlational nature of the analyses and single time assessment do not allow for causal inferences to be drawn, as the reported relations may reflect the effect of early experiences on reproductive development (Belsky, Steinberg, & Draper, 1991), genetic influences on reproductive development (Rowe, 2002), genes that influence both parental behavior and children's reproductive development (Comings, Muhleman, Johnson, & MacMurray, 2002), or some mix of factors.

Nonetheless, our large community sample provided a good initial opportunity to test our hypotheses with adult women who, on average, have experienced reduced opportunity during childhood and are old enough to have had the opportunity to have children. The overall pattern for these women is consistent with other life history models and research (e.g., Belsky et al., 1991; Ellis et al., 1999) but is most generally interpretable in terms of phenotypic plasticity that should modify the timing of reproductive maturation in accordance with opportunity and risk in the current ecology (Alexander, 1987; Geary, 2002). Familial conflict, parental investment, and family and community wealth are all predicted to contribute to this opportunity. CSA can be placed in the context of this wider life history perspective, and on the basis of our findings, it might be a particularly salient influence on girls' reproductive development and behavior.

References

- Alexander, R. D. (1987). *The biology of moral systems*. Hawthorne, NY: Aldine de Gruyter.
- Belsky, J., Steinberg, L., & Draper, P. (1991). Childhood experience, interpersonal development, and reproductive strategy: An evolutionary theory of socialization. *Child Development, 62*, 647–670.
- Berezkei, T., & Csanaky, A. (2001). Stressful family environment, mortality, and child socialisation: Life-history strategies among adolescents and adults from unfavourable social circumstances. *International Journal of Behavioral Development, 25*, 501–508.
- Bogin, B. (1999). Evolutionary perspective on human growth. *Annual Review of Anthropology, 28*, 109–153.
- Brown, J., Cohen, P., Chen, H., Smailes, E., & Johnson, J. G. (2004). Sexual trajectories of abused and neglected youths. *Journal of Developmental & Behavioral Pediatrics, 25*, 77–82.
- Charnov, E. L. (1993). *Life history invariants: Some explorations of symmetry in evolutionary ecology*. New York: Oxford University Press.
- Chisholm, J. S. (1993). Death, hope, and sex: Life-history theory and the development of reproductive strategies. *Current Anthropology, 34*, 1–24.
- Comings, D. E., Muhleman, D., Johnson, J. P., & MacMurray, J. P. (2002). Parent–daughter transmission of the androgen receptor gene as an explanation of the effect of father absence on age of menarche. *Child Development, 73*, 1046–1051.
- Dill, D. L., Chu, J. A., Grob, M. C., & Eisen, S. V. (1991). The relation of abuse history reports: A comparison of two inquiry formats. *Comprehensive Psychiatry, 32*, 166–169.
- Ellis, B. J. (2002). Of fathers and pheromones: Implications of cohabitation for daughters' pubertal timing. In A. Booth & C. Ann (Eds.), *The Pennsylvania State University Family Studies Symposia Series: Just living together: Implications of cohabitation on families, children, and social policy* (pp. 161–172). Mahwah, NJ: Erlbaum.
- Ellis, B. J., McFadyen-Ketchum, S., Dodge, K. A., Pettit, G. S., & Bates, J. E. (1999). Quality of early family relationships and individual differences in the timing of pubertal maturation in girls: A longitudinal test of an evolutionary model. *Journal of Personality and Social Psychology, 77*, 387–401.
- Finkelhor, D. (1987). The sexual abuse of children: Current research reviewed. *Psychiatric Annals, 17*, 233–241.
- Geary, D. C. (2002). Sexual selection and human life history. *Advances in Child Development and Behavior, 30*, 41–101.
- Geary, D. C., & Flinn, M. V. (2001). Evolution of human parental behavior and the human family. *Parenting: Science and Practice, 1*, 5–61.
- Geary, D. C., Vigil, J., & Byrd-Craven, J. (2004). Evolution of human mate choice. *Journal of Sex Research, 41*, 27–42.
- Geronimus, A. T. (1991). Teenage childbearing and social and reproductive disadvantage: The evolution of complex questions and the demise of simple answers. *Family Relations, 40*, 463–471.
- Harris, J. R. (1995). Where is the child's environment? A group socialization theory of development. *Psychological Review, 102*, 458–489.
- Herman-Giddens, M. E., Sandler, A. D., & Friedman, N. E. (1988). Sexual precocity in girls: An association with sexual abuse? *American Journal of Diseases of Children, 142*, 431–433.
- Herrenkohl, E. C., Herrenkohl, R. C., Egolf, B. P., & Russo, M. J. (1998). The relationship between early maltreatment and teenage parenthood. *Journal of Adolescence, 21*, 291–303.
- Hoier, S. (2003). Father absence and age at menarche. *Human Nature, 14*, 209–233.
- Hotte, J., & Rafman, S. (1992). The specific effects of incest on prepubertal girls from dysfunctional families. *Child Abuse & Neglect, 16*, 273–283.
- Hulanicka, B. (1999). Acceleration of menarcheal age of girls from dysfunctional families. *Journal of Reproductive and Infant Psychology, 17*, 119–132.
- Kendall-Tackett, K., & Becker-Blease, K. (2004). The importance of retrospective findings in child maltreatment research. *Child Abuse & Neglect, 28*, 723–727.
- Kendall-Tackett, K. A., & Simon, A. F. (1988). Molestation and the onset of puberty: Data from 365 adults molested as children. *Child Abuse & Neglect, 12*, 73–81.
- Kim, K., & Smith, P. K. (1998). Childhood stress, behavioural symptoms and mother–daughter pubertal development. *Journal of Adolescence, 21*, 231–240.
- Kirk, K. M., Blomberg, S. P., Duffy, D. L., Heath, A. C., Owens, I. P., & Martin, N. G. (2001). Natural selection and quantitative genetics of life history-traits in Western women: A twin study. *Evolution, 55*, 423–435.
- Lange, A., De Beurs, E., Dolan, C., Lachnit, C., Sjollem, S., & Hanewald, G. (1999). Long-term effects of childhood sexual abuse: Objective and subjective characteristics of the abuse and psychopathology in later life. *Journal of Nervous and Mental Disease, 187*, 150–158.
- Li, N. P., Bailey, J. M., Kenrick, D. T., & Linsenmeier, J. A. W. (2002). The necessities and luxuries of mate preferences: Testing the tradeoffs. *Journal of Personality and Social Psychology, 82*, 947–955.
- Menken, J., Trussell, J., & Larsen, U. (1986, September 26). Age and infertility. *Science, 233*, 1389–1394.
- Mitchell, K., & Wellings, K. (1998). First sexual intercourse: Anticipation and communication. Interviews with young people in England. *Journal of Adolescence, 21*, 717–726.
- Molnar, B. E., Buka, S. L., & Kessler, R. C. (2001). Child sexual abuse and subsequent psychopathology: Results from the National Comorbidity Survey. *American Journal of Public Health, 91*, 753–760.
- Must, A., Philips, S. M., Naumova, E. N., Blum, M., Harris, S., Dawson-Hughes, B., et al. (2002). Recall of early menstrual history and menarcheal body size: After 30 years, how well do women remember? *American Journal of Epidemiology, 155*, 672–679.
- Palazzi, S., De Vito, E., Luzzati, D., Guerrini, A., & Torre, E. (1990). A study of the relationship between life events and disturbed self-image in adolescents. *Journal of Adolescence, 13*, 53–63.
- Pedersen, W., Samuelsen, S. O., & Wichstrom, L. (2003). Intercourse debut age: Poor resources, problem behavior, or romantic appeal? A

- population-based longitudinal study. *Journal of Sex Research*, 40, 333–345.
- Romans, S. E., Martin, J. M., Gendall, K., & Herbison, G. P. (2003). Age of menarche: The role of some psychosocial factors. *Psychological Medicine*, 35, 933–939.
- Rosenthal, D. A., Smith, A. M., & de Visser, R. (1999). Personal and social factors influencing age at first sexual intercourse. *Archives of Sexual Behavior*, 28, 319–333.
- Rowe, D. C. (2002). On genetic variation in menarche and age at first sexual intercourse: A critique of the Belsky–Draper hypothesis. *Evolution and Human Behavior*, 23, 365–372.
- Rucibwa, N. K., Modeste, N., Montgomery, S., & Fox, C. A. (2003). Exploring family factors and sexual behaviors in a group of Black and Hispanic adolescent males. *American Journal of Health Behavior*, 27, 63–74.
- Schvaneveldt, P. L., Miller, B. C., Berry, E. H., & Lee, T. R. (2001). Academic goals, achievement, and age at first sexual intercourse: Longitudinal, bidirectional influences. *Adolescence*, 36, 767–787.
- Steel, J., Sanna, L., Hammond, B., Whipple, J., & Cross, H. (2004). Psychological sequelae of childhood sexual abuse: Abuse-related characteristics, coping strategies, and attributional style. *Child Abuse & Neglect*, 28, 785–801.
- Tang, C. S. (2002). Childhood experience of sexual abuse among Hong Kong Chinese college students. *Child Abuse & Neglect*, 26, 23–37.
- Thornhill, R., & Palmer, C. (2000). *A natural history of rape: Biological bases of sexual coercion*. Cambridge, MA: MIT Press.
- Trickett, P. K., & Putnam, F. W. (1993). The impact of child sexual abuse on females: Toward a developmental, psychobiological integration. *Psychological Science*, 4, 81–87.
- Turner, P. K., Runtz, M. G., & Galambos, N. L. (1999). Sexual abuse, pubertal timing, and subjective age in adolescent girls: A research note. *Journal of Reproductive and Infant Psychology*, 17, 111–118.
- Widom, C. S., Raphael, K. G., & DuMont, K. A. (2004). The case for prospective longitudinal studies in child maltreatment research: Commentary on Dube, Williamson, Thompson, Felitti, and Anda (2004). *Child Abuse & Neglect*, 28, 715–722.
- Wilsnack, S. C., Wonderlich, S. A., Kristjanson, A. F., Vogeltanz-Holm, N. D., & Wilsnack, R. W. (2002). Self-reports of forgetting and remembering childhood sexual abuse in a nationally representative sample of U.S. women. *Child Abuse & Neglect*, 26, 139–147.
- Wu, L. L., & Thomson, E. (2001). Race differences in family experience and early sexual initiation: Dynamic models of family structure and family change. *Journal of Marriage and Family*, 63, 682–696.

Received June 2, 2004

Revision received November 15, 2004

Accepted December 12, 2004 ■

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