



**WHY—not how--WOULD NATURAL
SELECTION CRAFT AN ORGANISM
WHOSE FUTURE FUNCTIONING IS
INFLUENCED BY ITS EARLIER
EXPERIENCES?**

Jay Belsky

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**FATHER ABSENCE AND REPRODUCTIVE STRATEGY:
AN EVOLUTIONARY PERSPECTIVE¹**

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Henry Harpending**

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Draper & Harpending, 1982

Females raised in father absent households:

“show early expression of *sexual interest and assumption of sexual activity, negative attitudes toward males, and poor ability to establish long-term relationships with one male”*
(i.e., reproductive strategy)



Developmental Critique

- Old wine in a new bottle?**
- Law of Parsimony**
- Developmental mechanism/process?**
- Original Prediction?**

[*Child Development*, 1991, 62, 647–670. © 1991 by the Society for Research in Child Development, Inc.
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Theoretical Paper

**Childhood Experience, Interpersonal
Development, and Reproductive Strategy:
An Evolutionary Theory of Socialization**

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Laurence Steinberg

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DEVELOPMENTAL PATHWAYS OF DIVERGENT REPRODUCTIVE STRATEGIES

TYPE I

Marital discord
High stress
Inadequate \$ resources

Harsh, rejecting
insensitive
Inconsistent

Insecure attachment
Mistrustful internal
working model
Opportunistic interpersonal
orientation



Aggressive
Noncompliant



Anxious
Depressed

Early maturation / puberty

Earlier sexual activity
Short-term, unstable
pair bonds
Limited parental investment

A. FAMILY CONTEXT

B. CHILDREARING
Infancy / Early Childhood

**C. PSYCHOLOGICAL /
BEHAVIORAL
DEVELOPMENT**

**D. SOMATIC
DEVELOPMENT**

**E. REPRODUCTIVE
STRATEGY**

TYPE II

Spousal harmony
Adequate \$ resources

Sensitive, supportive,
responsive
Positively affectionate

Secure attachment
Trusting internal working
model
Reciprocally-rewarding
interpersonal orientation

Later maturation / puberty

Later sexual activity
Long-term, enduring
pair bonds
Greater parental investment

Psychological Bulletin
2004, Vol. 130, No. 6, 920–958

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0033-2909/04/\$12.00 DOI: 10.1037/0033-2909.130.6.920

Timing of Pubertal Maturation in Girls: An Integrated Life History Approach

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Summary. Psychosocial acceleration theory posits that warm, cohesive family environments slow down pubertal development, whereas dangerous or conflictual family environments accelerate it. Empirical research to date has provided reasonable, though incomplete, support for the theory. On the one hand, there is converging evidence from a number of methodologically sound studies that greater parent–child warmth and cohesion is associated with later pubertal development. This research also suggests that greater frequency of parent–child interactions predicts later puberty. On the other hand, the proposed accelerating effect of parent–child conflict and coercion on pubertal development is yet to be clearly established.

Source: Ellis, 2004, p. 935-936.

RECENT STUDIES HIGHLIGHTING EFFECTS
OF ADVERSE REARING CONDITIONS



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Available online at www.sciencedirect.com



Drug and Alcohol Dependence 88S (2007) S50–S59

**DRUG and
ALCOHOL
DEPENDENCE**

www.elsevier.com/locate/drugaldep

Pubertal maturation and the development of alcohol use and abuse

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EFFECTS OF CHILD MALTREATMENT

By age 13, 14.3% of sample of 1400+ children had been maltreated according to own or parental report (4.3% physical abuse, 10.0% sexual abuse).

	<u>Mean Age of Tanner IV</u>
Maltreated	11.6 years (sd = 1.0)
Non-maltreated	12.1 years (sd = 1.3)

(OR: 0.75, $p < .011$)

Child Development, November/December 2007, Volume 78, Number 6, Pages 1799 – 1817

Family Environments, Adrenarche, and Sexual Maturation: A Longitudinal
Test of a Life History Model

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University of Arizona

Marilyn J. Essex

University of Wisconsin—Madison

Retrospective
Recall

Preschool

3rd Grade

5th Grade

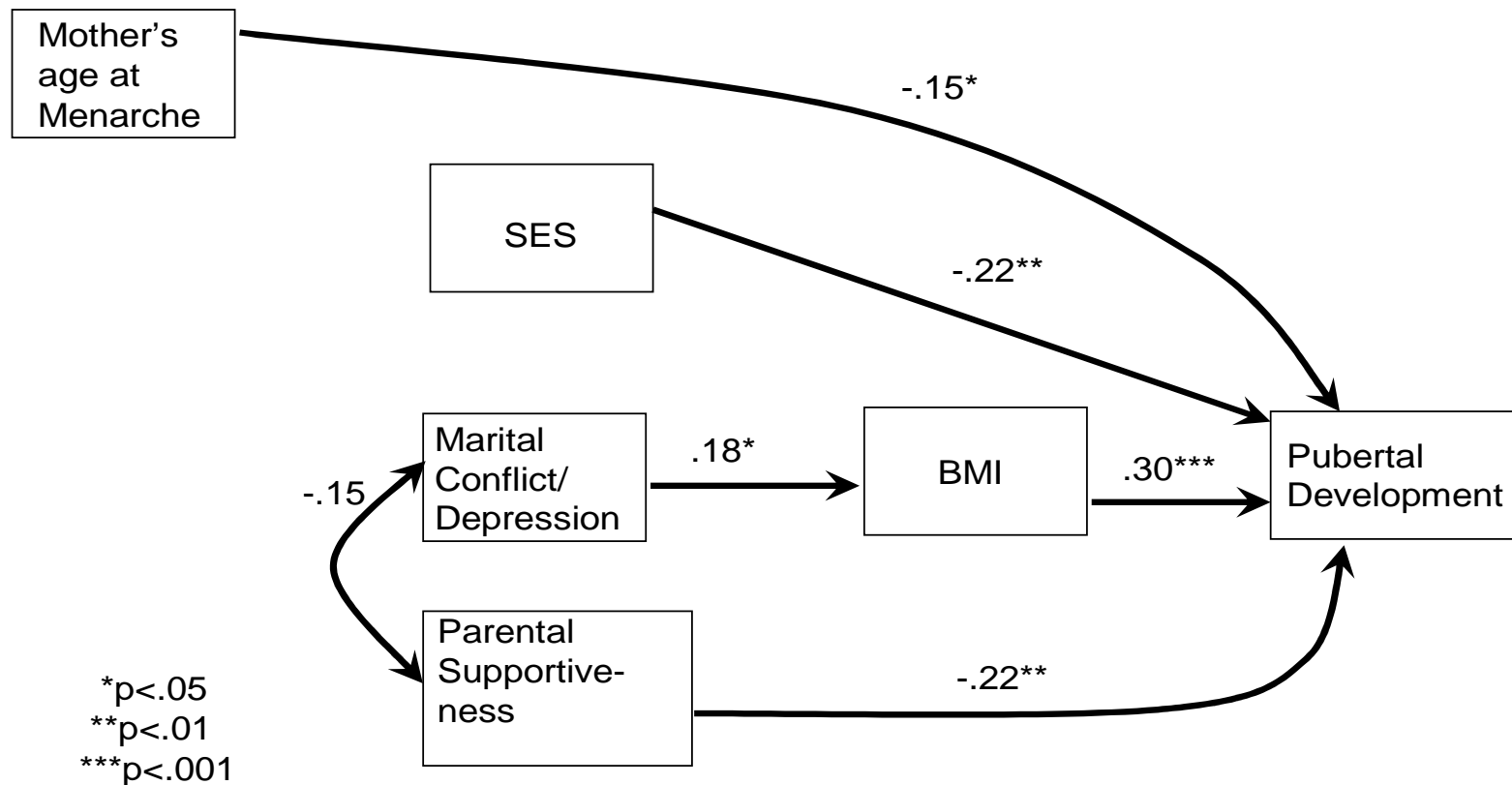


Figure 1: ***High Pubertal Development Score reflects accelerated development (i.e., greater secondary sex characteristics) (N = 139).*** . .

Developmental Psychology 2010, Vol. 46, No. 1, 120–128

The Development of Reproductive Strategy in Females: Early Maternal
Harshness → Earlier Menarche → Increased Sexual Risk Taking

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Birkbeck University of London

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Temple University

Renate M. Houts

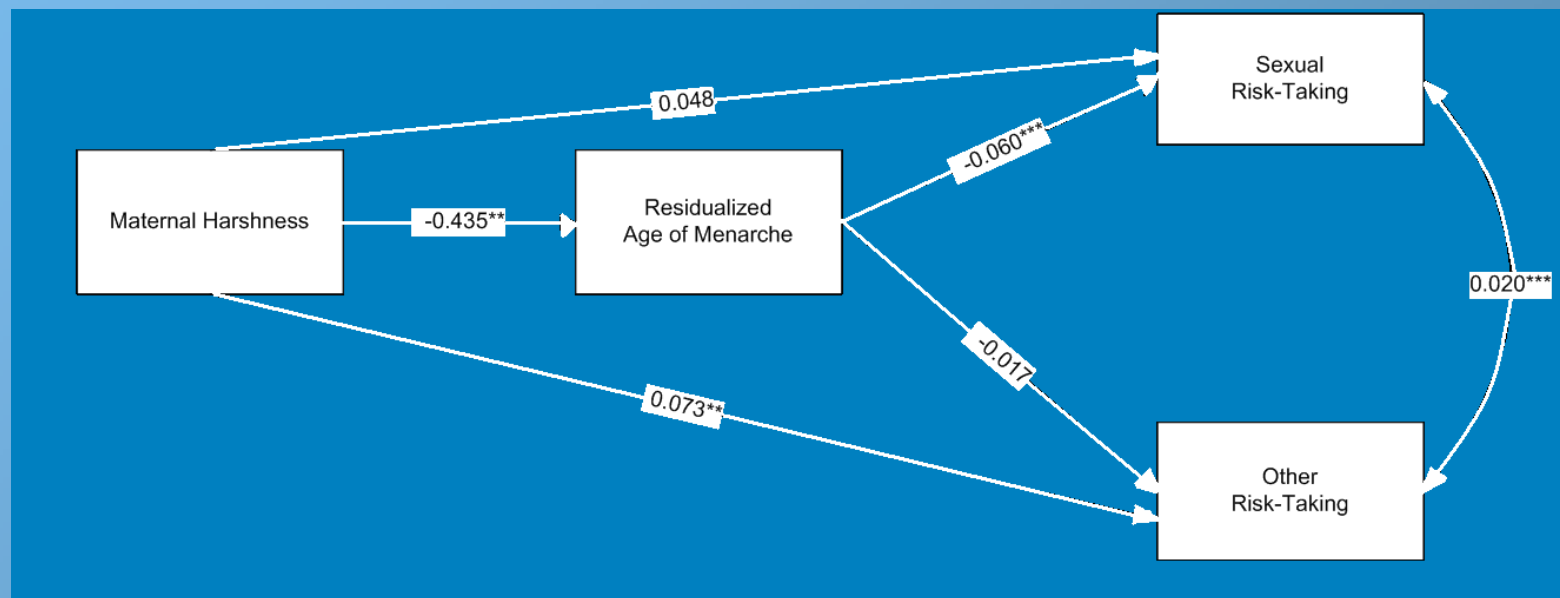
Duke University

Bonnie L. Halpern-Felsher

*University of California, San
Francisco*

the NICHD Early Child
Care Research Network

Unstandardized model estimates connecting maternal harshness with sexual and other risk-taking via residualized age of menarche



Tests of Model Fit:

χ^2 (12, N = 526) = 14.380; p = 0.2771

Comparative Fit Index (CFI)	0.979
Tucker-Lewis Index (TLI)	0.968
Root Mean Square Error of Approximation (RMSEA)	0.034
95% Confidence Interval	(0.000, 0.088)



Institute for the Study
of Children, Families
and Social Issues



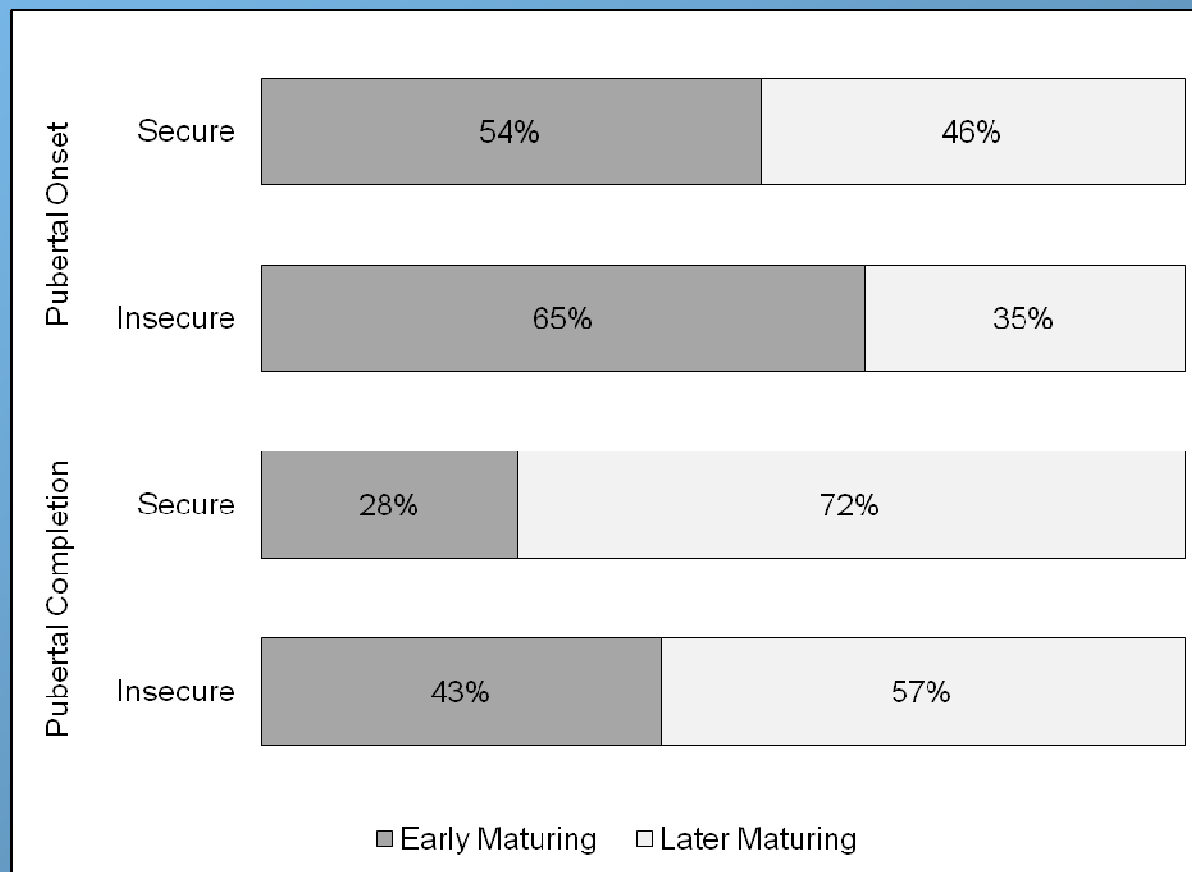
Can Very Early Experience/Development Predict Pubertal Timing?

Belsky, J., Houts, R.M. & Fearon, R.M.P (2010). Infant Attachment Security and Timing of Puberty: Testing an Evolutionary Hypothesis. *Psychological Science*, 21, 1195-1201



Attachment security and timing of pubertal onset and completion

(Early onset: pubertal onset <10½ years; early completion: <13½ years.)





**BUT GIVEN THAT THE FUTURE IS
INHERENTLY UNCERTAIN,
SHOULD ALL ORGANISMS BE
EQUALLY SUSCEPTIBLE TO
ENVIRONMENTAL INFLUENCES?**



CONDITIONAL *AND* ALTERNATIVE REPRODUCTIVE STRATEGIES: Differential Susceptibility to Environmental Influences

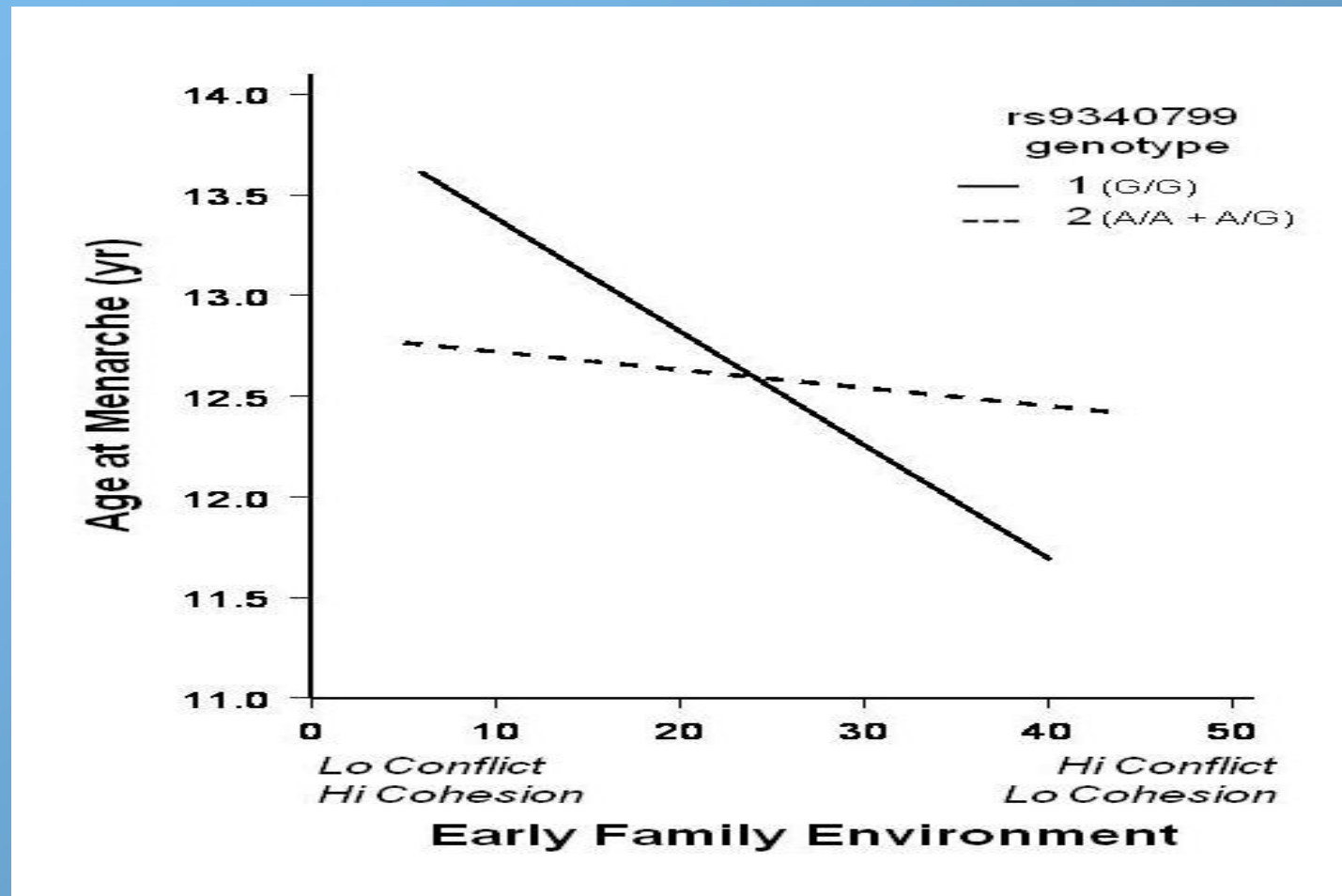
Belsky, J. (2000). Conditional and Alternative Reproductive Strategies: Individual Differences in Susceptibility to Rearing Experience. In J. Rodgers, D. Rowe, & W. Miller (Eds.), Genetic Influences on Human Fertility and Sexuality: Theoretical and Empirical Contributions from Biological and Behavioral Sciences (pp. 127-146). Boston: Kluwer



Testing Conditional vs.
Alternative Reproductive
Strategy Hypothesis:
Estrogen Receptor- α (*ESR1*)
Polymorphism as Moderator



Early Family Environment and Age of Menarche



Manuck, S. et al. (in press). Reported Early Family Environment Covaries with Menarcheal Age as a Function of Polymorphic Variation in Estrogen Receptor- α (*ESR1*). *Development & Psychopathology*



Future Directions Mechanisms of Influence?

By what physiological mechanism(s) might rearing experience, including insecurity-inducing insensitive mothering and maternal harsh control, come to regulate biological development and, thereby, reproductive strategy? Belsky et al. (1991) speculated that a neuroendocrine subsystem intertwined with other endocrine systems could provide a pathway linking experiences in the family with pubertal timing. More recently, Chisholm and associates (2005) theorized that the hypothalamic-pituitary-adrenal (HPA) axis in particular, which is directly involved in stress regulation, may play a critical role in the process.



Mechanisms of Influence?

(cont)

Recent elegant experimental research with rats by Cameron and associates (2008; Cameron, Fish & Meaney, 2008) showed not only that maternal licking and grooming of the newborn pup enhances stress regulation, delays the onset of puberty and reduces sexual activity, with the reverse being true of its absence, but that such effects on rat reproductive strategy are mediated by maternal-care effects on gene expression, via methylation.

What remains unclear, of course, is whether these same processes operate in the early regulation of reproductive strategy in humans.