Associations Between Family Structure and Child Cognitive Outcomes in the First Three Years of Life

by
Rebecca M. Ryan
Christy Brady-Smith
& Jeanne Brooks-Gunn

National Center for Children and Families
Teachers College, Columbia University

Head Start's Seventh National Research Conference,
Washington, DC, June 2004

Abstract

The present study uses data from the Early Head Start (EHS) Research and Evaluation Project to compare cognitive scores (Bayley MDI) among children with married, cohabiting and non-coresident biological parents at 14, 24, and 36 months. ANOVAs reveal that the groups do not have significantly different cognitive scores at 14 months; differences emerge later, with children of married parents scoring higher than both unwed groups at 24 and 36 months. OLS regressions suggest that at both 24 and 36 months maternal demographic characteristics (race, age, education, urbanicity) explain between 25% and 30% of the variation associated with cohabitation, with maternal parenting explaining an additional 15%. Maternal demographics explain a larger percent of the variation associated with non-coresidency (58-63%), while maternal parenting also adds somewhat to the model. When maternal demographics are controlled, neither income, maternal emotional wellbeing, nor father involvement are associated with child outcomes or explain a significant proportion of the variation associated with family structure.

Introduction

Research on child development within nontraditional families has consistently found an association between parents' relationship status and child wellbeing (McLanahan, 1997), with children of single and unmarried parents showing poorer cognitive outcomes than those living in married, two-parent families (Korenman, Kaestner, & Joyce, 2001; Sandefur & Wells, 1999). Recent policy initiatives to promote marriage among unwed parents were inspired at least in part by demonstrated links between family structure and child development (Fagan, 2001; Ooms, 2002). Prior research, however, has failed to determine if poorer child outcomes among unwed families are associated with parents' marital or residency status, nor has it illuminated how family structure relates to child outcomes over time. In this study, we address weaknesses in the current literature by examining cognitive scores of infants and toddlers with married, cohabiting but unwed, or non-coresident parents. Using stepwise OLS regressions, we examine whether factors that influence entry into family structure – maternal demographic characteristics – or factors that could be influenced by family structure – family processes – account for variation among the groups.

Research Questions

1) Are there differences in cognitive development from ages 1 to 3 among children of married, cohabiting and non-coresident parents?
   a) Are differences associated with marriage or co-residency?
   b) Do differences change over time?

2) What factors account for differences? Those associated with selection into certain family structures or those potentially influenced by family structure?

Method: Sample

- Participants in the Early Head Start (EHS) Research and Evaluation Project
  - 17-site longitudinal evaluation of EHS services
  - 50% randomly assigned to receive EHS services (program group)

- 711 low-income mothers and their children
  - Mothers interviewed at baseline & when child was 14-, 24-, & 36-months-old
  - Child assessments at ages 14, 24, & 36 months
  - Sample includes only White (*n*=413) and Black (*n*=298) mothers and children assessed at all timepoints (*N*=711)
  - Program and control groups combined; program status controlled in all analyses

Method: Main Variables

- **Family structure** –

  Mother-report at 14 months:

  1) *Married* to biological father (*n*=216, 30.4%)
  2) *Cohabiting* with biological father (*n*=108, 15.2%)
  3) *Non-coresident* with biological father (*n*=387, 54.4%)

- **Child cognitive development** –

  Bayley Scales of Infant Development: Mental Development Index (MDI) standardized scores at 14 months (*M*=98.8, *SD*=10.5), 24 months (*M*=90.4, *SD*=13.2) and 36 months (*M*=92.0, *SD*=12.3)

Method: Explanatory Variables

- **Selection Factors**: variables that precede child's birth, *cannot be* affected by family structure, but are associated with family structure:
  - Maternal Demographics (race, age at child's birth, education, urban)

- **Non-selection Factors**: variables that could change after child's birth, could be affected by family structure, and are associated with family structure
  - Income
  - Parenting
  - Maternal Wellbeing
  - Father Involvement

Method: Explanatory Variables, cont.

Construct	Variable	Time	Description
Maternal Demographics	Race	Baseline	Indicator variable for Black
	Age	Baseline	Indicator variable for teenage (<20) at child's birth
	Education	Baseline	Indicator variable for < High School/GED Indicator variable for > High School/GED
	Urbanicity	Baseline	Indicator variable for site is urban
Income	Poverty Level	Baseline	Indicator variable for <33% of FPL Indicator variable for >100% of FPL
Parenting	Maternal Supportiveness	14 months	Coded from 10-min videotaped free play interaction between mother and child; Responsiveness to child's cues, expressions of love, and quality of stimulation
Maternal Wellbeing	Depression	14 months	CESD; sum of 20-item mother-report measure of mood within last week; e.g., "You felt lonely"; from < 1 day (=0) to 5-7 days/wk (=3)
Father Involvement	Father-child activities	24 months	Mean of 4 mother-report items on freq. of father-child activities (reading, feeding, going outside and playing w/child); 6-point scale

Method: Analytic Strategy

Question 1:

ANOVAs to determine if mean Bayley MDI scores differ among family structure groups at 14, 24, and 36 months unadjusted for maternal demographics or other explanatory variables

Question 2:

OLS regression analyses to determine if factors that influence family structure – maternal demographics – or factors that could be influenced by family structure – income, parenting, parent wellbeing or father involvement – account for variation in scores.

Explanatory Variables by Family Structure

	Full	Married		Cohabiting		Non-Cores.		
Maternal Demographics (%)								
Black	41.9	15.7	a	35.2	b	58.4	c	***
Teenage	38.0	19.4	a	38.9	b	48.1	b	***
<HS	35.4	19.0	a	38.9	b	43.7	b	***
>HS	30.1	41.7	a	23.1	b	25.6	b	***
Urban	47.0	29.6	a	60.2	b	53.0	b	***
Income (%)								
<33% Poverty	24.8	12.0	a	24.1	b	32.0	b	***
Above Poverty	12.0	20.4	a	9.3	b	8.0	b	***
Mat. Supportiveness	4.08	4.45	a	4.02	b	3.88	b	***
[*SD*]	[1.05]	[.97]		[.93]		[1.07]		
Mat. Depression	13.11	12.99		13.03		13.21		ns
[*SD*]	[9.71]	[8.66]		[9.78]		[9.71]		
Father Involvement	3.90	5.26	a	4.83	b	2.77	c	***
[*SD*]	[1.93]	[0.92]		[1.39]		[1.84]		

Note. *N*s for supportiveness, depression and father involvement range from 644-694; percentages indicate proportion within family structure group; different subscripts across groups denote significant differences at $p<.10$ in Bonferroni-adjusted pairwise comparisons; ***$p<.001$.

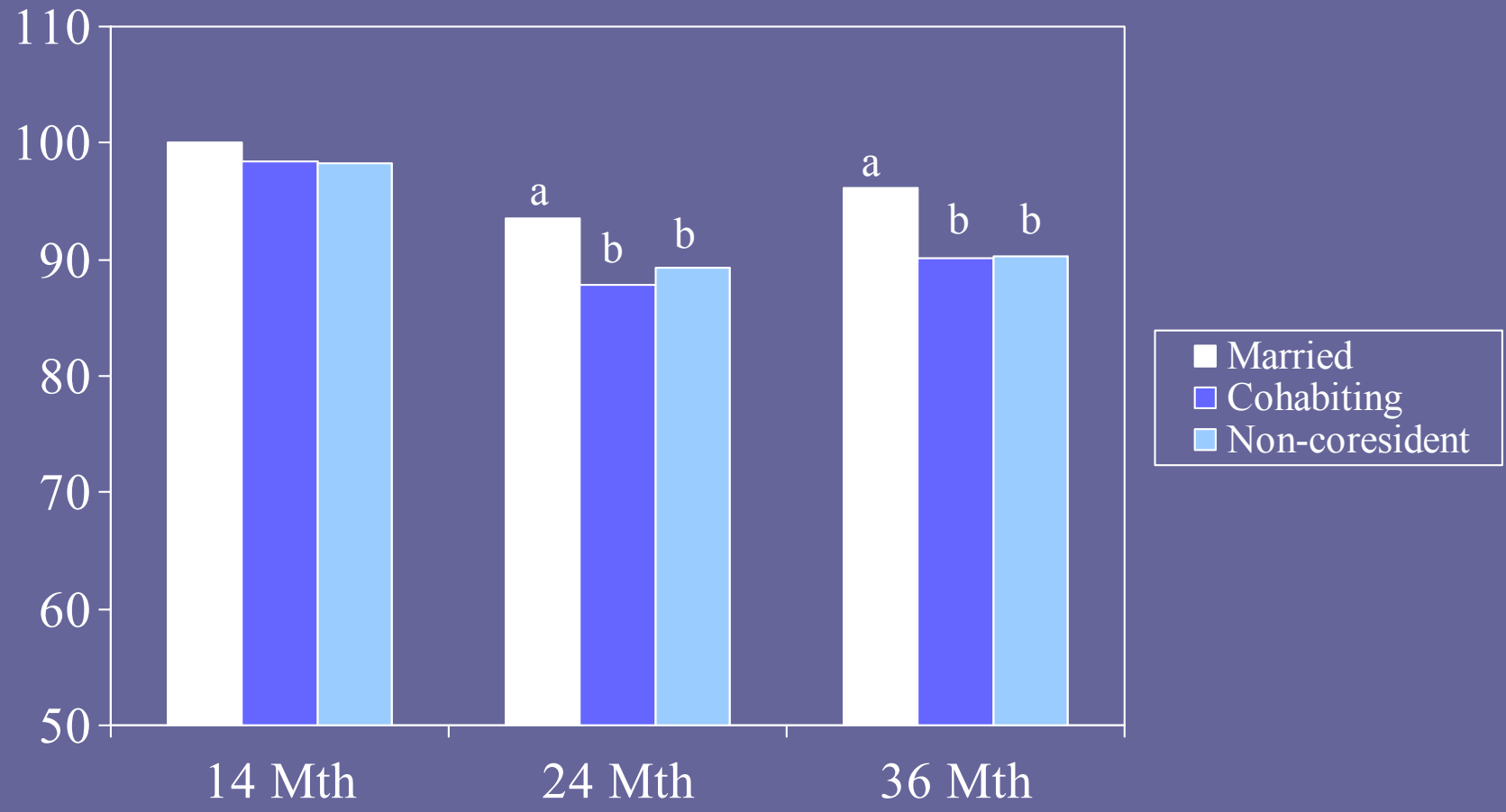
Results: Question 1

- Differences in Bayley scores among groups emerge at 24 months, with children of married parents scoring higher than those of both unwed groups.

- Differences are more strongly associated with marriage than residency, as there are no differences between children of cohabiting and non-coresident parents.

- Differences among children of married and unwed parents increase over time, with the largest increase between 14 and 24 months.

Unadjusted Bayley MDI Scores at 14, 24, and 36 Months by Family Structure



Note. *N*=711; different subscripts across groups denote significant differences at $p<.001$ in Bonferroni-adjusted pairwise comparisons.

Results: Question 2

- Maternal demographics account for 25 - 30% of the difference between children of married and cohabiting parents, with maternal supportiveness accounting for an additional 14% at 24 months and 17% at 36 months.

- Maternal demographics account for 58 - 63% of the difference between children of married and non-coresident parents, with maternal supportiveness accounting for an additional 16% at 24 months and 8% at 36 months.

- Neither income, maternal depression, nor father involvement account for a notable percentage of the variation in scores.

- Once maternal demographics and parenting are entered into models, the coefficient for non-coresident becomes marginally to non-significant, while the coefficient for cohabitation remains significant.

Effect of Family Structure on 24-Month Bayley MDI Scores when Explanatory Variables Added to OLS Regression Models

	Married	Cohabiting			Non-Cores.			R^2	R^2 Change	
		b	*SE*		*b*	*SE*				
Step 1: Family structure only	Omitted	-5.12	1.65	**	-4.38	1.21	***	0.03	n/a	
Step 2: Enter maternal demographics (+ program)	Omitted	-3.62	1.67	*	-1.64	1.32		0.09	0.07	***
Step 3: Enter income	Omitted	-3.42	1.68	*	-1.40	1.35		0.10	0.01	
Step 4: Enter maternal supportiveness	Omitted	-2.61	1.63		-0.79	1.31		0.16	0.06	***
Step 5: Enter maternal depression	Omitted	-2.67	1.63	+	-0.80	1.31		0.16	0.00	
Step 6: Enter paternal involvement	Omitted	-2.71	1.63	+	-1.05	1.56		0.16	0.00	

Note. N=605. +p<.10; *p<.05; **p<.01; ***p<.001; in step 2, Black (b=-5.60, p<.001) and program (b=3.54, p<.001) are significant; in step 4, maternal supportiveness (b=3.54, p<.001) is significant; no other coefficients are significant.

Effect of Family Structure on 36-Month Bayley MDI Scores when Explanatory Variables Added to OLS Regression Models

	Married	Cohabiting			Non-Cores.					
		b	*SE*		*b*	*SE*		R^2	R^2 Change	
Step 1: Family structure only	Omitted	-5.70	1.53	***	-5.98	1.12	***	0.05	n/a	
Step 2: Enter maternal demographics (+ program)	Omitted	-4.28	1.51	**	-2.61	1.20	*	0.15	0.10	***
Step 3: Enter income	Omitted	-4.31	1.52	**	-2.65	1.22	*	0.15	0.00	
Step 4: Enter maternal supportiveness	Omitted	-3.50	1.46	*	-2.03	1.18	+	0.22	0.07	***
Step 5: Enter maternal depression	Omitted	-3.55	1.46	*	-2.05	1.18	+	0.22	0.00	
Step 6: Enter paternal involvement	Omitted	-3.57	1.47	*	-2.19	1.40		0.22	0.00	

Note. N=605. +p<.10; *p<.05; **p<.01; ***p<.001; in step 2, Black (b=-7.69, p<.001), urban (b=2.30, p<.05) and program (b=2.54, p<.01) are significant; in step 4, maternal supportiveness (b=3.55, p<.001) is significant; no other coefficients are significant.

Results: Summary

- Selection factors account for a larger percent of the variation between children of married and non-coresident parents than they do between children of married and cohabiting parents.

- At 36 months, maternal parenting accounts for twice as much of the variation between children of married and cohabiting parents than it does between children of married and non-coresident parents.

- Taken together, these findings suggest selection factors account for most of the variation in children's scores associated with residency, while potential non-selection factors account for a notable amount of the variation associated with cohabitation.

- Much of the variation associated with cohabitation was not accounted for in these models, suggesting that omitted selection or non-selection factors might be driving the negative association between cohabitation and children's cognitive outcomes.

Discussion

Our results suggest that children growing up in different family structures have different cognitive developmental trajectories, and that those differences emerge and expand during early childhood. By distinguishing between children of married, cohabiting, and non-coresident parents, we were able to determine that differences are associated more with marriage than residency, at least during the early years. However, demographic factors that select parents into marriage, rather than factors that marriage could theoretically influence, account for most of the variation in children's cognitive scores associated with non-coresidency and a large percent of the variation associated with cohabitation. Maternal parenting also accounts for a notable percent of the variation, particularly between married and cohabiting parents' children, suggesting that among two-parent families parenting quality may explain some of the difference between children of married and unwed couples. It is important to note that although we categorize parenting as a non-selection factor, parenting quality could either influence selection into marriage (e.g., men choose to marry more supportive women) *or* be influenced by marriage (e.g., in more stable relationships, women can be more supportive parents).

References

Bayley, N. (1993). *Bayley Scales of Infant Development: Manual* (2nd ed.). New York: The Psychological Corporation, Harcourt, Brace, & Company.

Fagan, P. (2001). Encouraging marriage and discouraging divorce. *Backgrounder*, #1421. March 26, 2001. http://www.heritage.org/Research/Family/loader.cfm?url=/commonspot/security/getfile.cfm&PageID=2229

Korenman, S., Kaestner, R. & Joyce, T. J. (2001). Unintended pregnancy and the consequences of nonmarital childbearing. In L. L. Wu & B. Wolfe (Eds.), *Out of wedlock: Causes and consequence of nonmarital fertility* (pp.259-286). New York: Russell Sage Foundation.

McLanahan, S. (1997). Parent absence or poverty: Which matters more? In G. J. Duncan and J. Brooks-Gunn (Eds.), *Consequences of growing up poor* (pp.35-48). New York: Russell Sage Foundation.

Ooms, T. (August 2002). Marriage and government: Strange bedfellows? Center for Law and Social Policy, Policy Brief, Couple and Marriage Series, 1. http://www.clasp.org/DMS/Documents/1028563059.86/Marriage_Brief1.pdf

Sandefur, G. & Wells, T. (1999). Does family structure really influence educational attainment? *Social Science Research, 28*, 331-357.