

Pubertal maturation:  
Relations to adolescent mental health in two ethnic groups

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This study makes use of data from the Maryland Adolescent Growth in Contexts Study (Eccles & Sameroff, PIs). The author gratefully acknowledges the contributions of Jacquelynne Eccles and Arnold Sameroff, the project staff, and the adolescents and their families participating in the research. Please address correspondence to Alice Michael, Center for Human Growth and Development, Room 1011SW, 300 North Ingalls Building, Ann Arbor, MI. 48109. (email: [alicem@umich.edu](mailto:alicem@umich.edu))

## ABSTRACT

The current study investigates the relations between pubertal timing and adolescent mental health for both white and African-American adolescents during the 8th grade. Adolescents are participants in the Maryland Adolescent Growth in Context Study (MAGICS; Eccles & Sameroff, P.I.s). Consistent with theories of off-time development, previous research has established links between early maturation and worse mental health for girls, and between late maturation and lower self-esteem for boys. However, these associations have rarely been tested beyond middle-class white samples.

This study replicates the findings for white adolescents; off-time development had negative consequences for girls' self-esteem and eating behavior, and for boys' anger, eating and self-esteem. However, these associations did not hold true for the African-American adolescents. Findings suggest that pubertal timing may have limited explanatory value when examined in isolation. Possible social and psychological processes which may be moderating the associations between pubertal timing and mental health include; the meaning of maturation in the family and social contexts, cultural messages about ideal body-type, and individual preparation for and expectations about changes associated with puberty.

## INTRODUCTION

Researchers investigating processes and correlates of pubertal maturation have found the timing of maturation relative to the peer group to have implications for adolescent mental health. The results of these studies are typically consistent with models of off-time development or social deviance, which predict negative consequences for individuals who achieve normative milestones significantly earlier or later than their age-mates. Early maturation has been identified as a risk factor for the development of depression, eating disorders, and low self-esteem for girls. Late maturation has been identified as a risk factor for boys' self-esteem. However, these associations have rarely been examined beyond middle-class white samples.

The current study investigates these associations in a large sample of both African-American and white girls and boys. As the physical changes that occur during puberty are given psychological and social meaning within broader social contexts, we would expect differences in context (such as ethnic group membership) to impact the relationship between of pubertal timing and mental health during adolescence.

## RESEARCH QUESTIONS

\*Can we replicate previous findings for early maturing girls and late maturing boys; do these adolescents indicate worse mental health than their on-time peers in 8th grade?

\*Are these patterns the same for African-American and white girls and boys?

## METHOD

### Participants

This sample of eighth graders ( $n=868$ ) is drawn from the second wave of the Maryland Adolescent Growth in Context Study (MAGICS). The sample is roughly two-thirds African American ( $n=550$ ) and one-third white ( $n=318$ ), and represents a wide range of socioeconomic backgrounds across racial/ethnic groups. The adolescents were 13.5 years old (range 13-14) at the time of data collection. There were comparable numbers of boys ( $n=437$ ) and girls ( $n=431$ ).

## MEASURES

### Pubertal Growth

(adapted from the Petersen Pubertal Scale, 1988)

<u>Item</u>	<u>White</u>		<u>AfricanAmerican</u>		<u>Range</u>
	<u>Girls</u>	<u>Boys</u>	<u>Girls</u>	<u>Boys</u>	
Growth Spurt*	2.91	2.54	2.79	2.47	1=not yet begun 4=changes completed
Skin Changes*	2.78	2.64	2.62	2.37	1=not yet begun 4=changes completed
Perception of Timing Relative to Peers	3.00	2.88	2.90	2.94	1= a lot sooner 3= about the same 5=a lot later
Breast Development <sup>g</sup>	3.63		3.00		0=not yet begun 1=began in 3rd grade 6=began in 8th grade
Menarche <sup>g</sup>	4.40		4.05		1=3rd grade 6=8th grade
Voice Change <sup>b</sup>		2.78		2.63	1=not yet begun 4=voice changed completely
Sex Organ Development <sup>b</sup>		3.30		3.09	1= began in 4th grade 5= began in 8th grade

**Pubertal Index:** 5 items are standardized and averaged to create overall index of growth. Higher scores indicate later maturation.

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\* Items reversed in Pubertal Index

<sup>g</sup> Items asked of girls only

<sup>b</sup> items asked of boys only

Note: Overall, African-American adolescents reported somewhat earlier maturation than did Whites. As expected, girls reported earlier maturation than did boys. In particular, African-American girls reported maturing earlier than did White girls (average about 1/2 a grade earlier on most measures).

## Pubertal Timing

Groups of **Early**, **On-Time** and **Late** maturing adolescent boys and girls were identified by individuals' scores on the overall puberty index using the following criterion.

Puberty Index Ranking	Pubertal Timing
Earliest 1/6	Early
Middle 2/3	On-Time
Latest 1/6	Late

Because there were some significant differences in the maturational timing between African-Americans and whites, membership in pubertal timing groups was established within both ethnicity and gender.

### Stability of Puberty Index Ratings

Estimates of pubertal timing using this index demonstrate moderate stability between 6th and 8th grade. Cross-time correlations were ( $r=.63$ ) for girls, and ( $r=.50$ ) for boys.

## Mental Health

<u>Scale</u>	<u>Mean</u>	<u>Range</u>
Children's Depression Inventory (CDI: Kovacs, 1983)	9.75	1-44
Anger	2.34	1-5
Eating Disturbance	1.95	1-6
Low Self-Esteem	2.14	1-5
Low Resilience	2.16	1-5

Note: Adolescent self-reported items were factor analysed to confirm inclusion in these scales. Internal consistence ratings (Chronbach's alpha) were adequate for the measures presented here.

## RESULTS

**\*Can we replicate previous findings for early maturing girls and late maturing boys; do these adolescents indicate worse mental health than their “on-time” peers in 8th grade?**

As can be seen in the following graphs, pubertal timing does relate to eating disturbance and self-esteem difficulties for white girls and boys.

No differences in levels of depression or resilience emerged as a function of pubertal timing.

### Early maturing white girls

- \*elevated levels of eating disturbance (early > on-time, late)
- \*lower self-esteem (early > on-time)

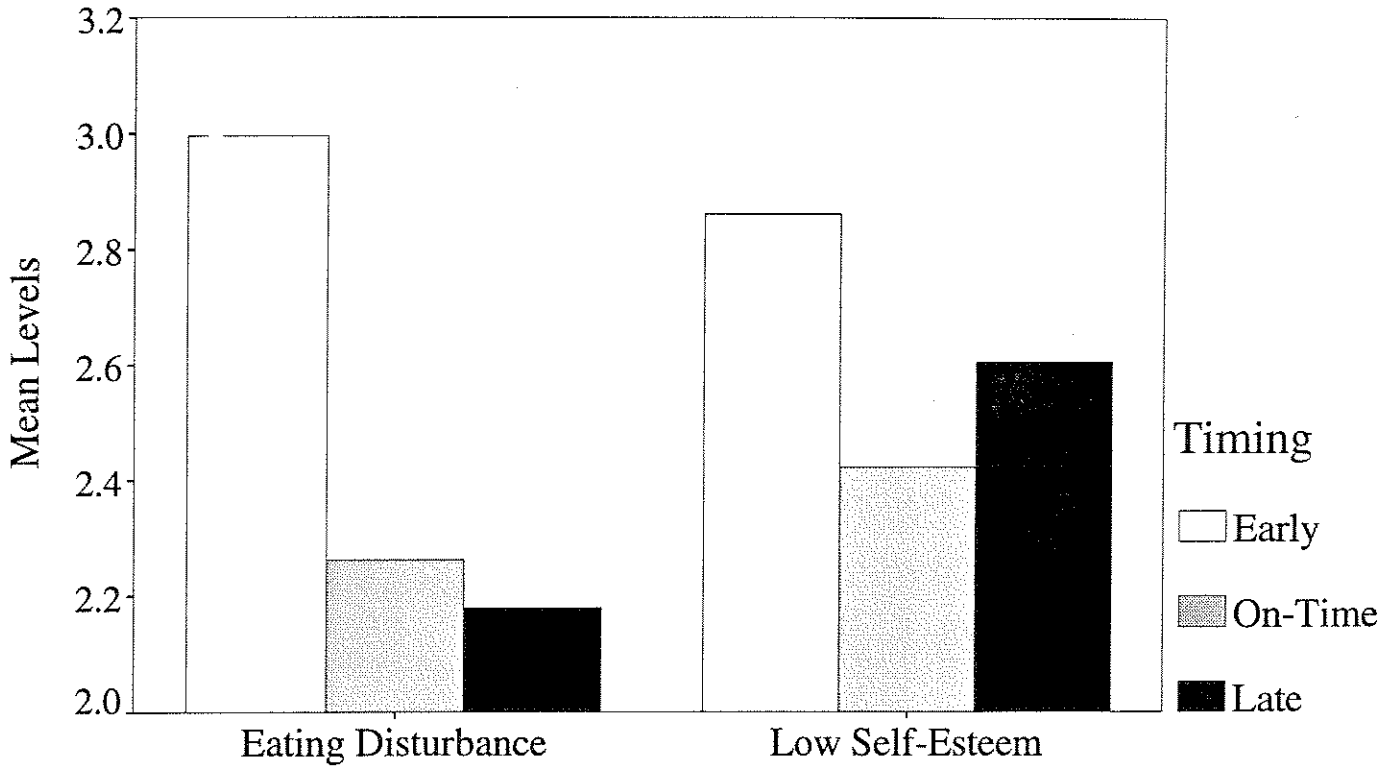
### Late maturing white boys

- \*lower anger (late < on-time)
- \*elevated levels of eating disturbance (late > on-time, early)
- \*lower self-esteem (late > early)

**\*Are these patterns the same for African-American and white girls and boys?**

No significant differences emerged between pubertal timing groups for African-American boys' or girls' mental health. Patterns are not consistent across these ethnic groups.

### Pubertal Timing Effects for White Girls' Mental Health

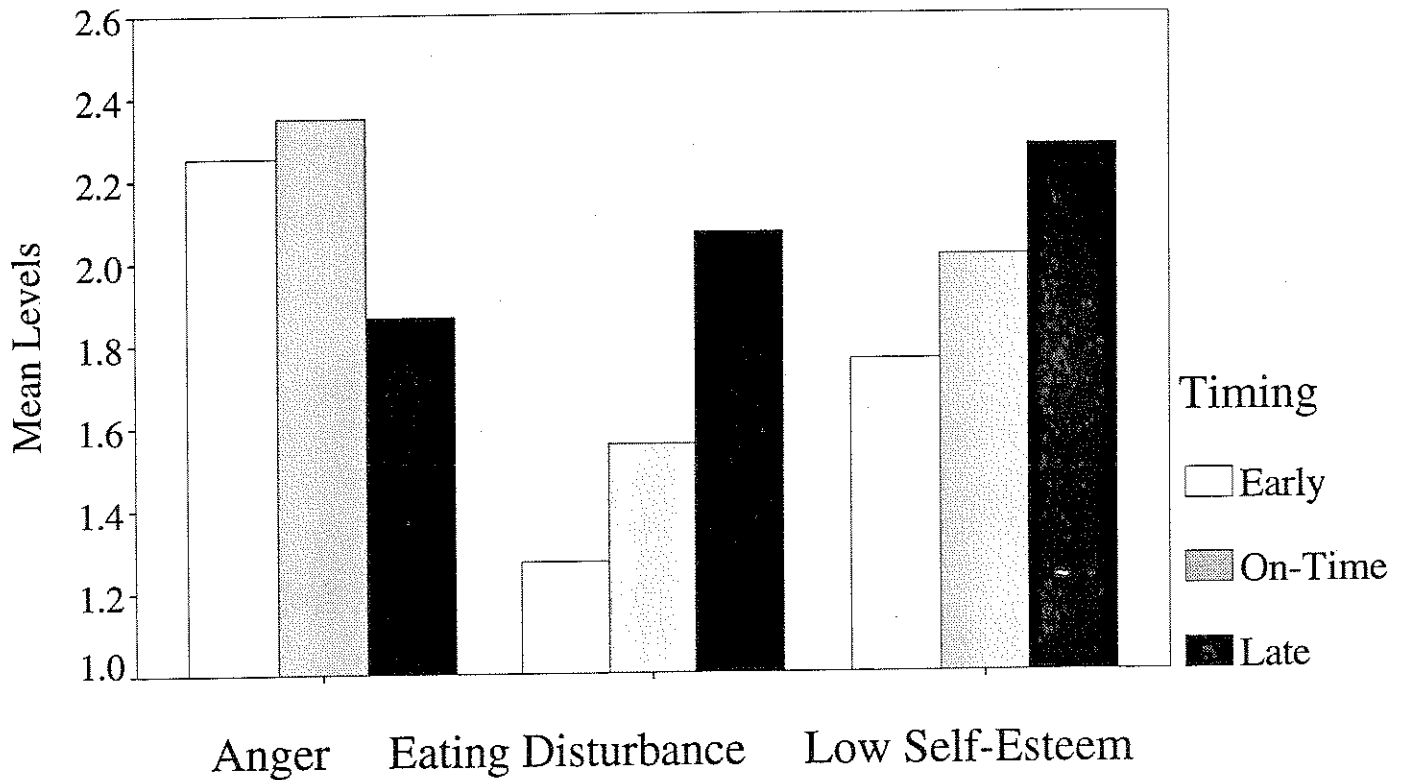


**Early maturing white girls**

\*elevated levels of eating disturbance (early > on-time, late)

\*lower self-esteem (early > on-time)

## Pubertal Timing Effects for White Boys' Mental Health



### Late maturing white boys

\*lower anger (late<on-time)

\*elevated levels of eating disturbance (late>on-time, early)

\*lower self-esteem (late>early)



## DISCUSSION

Results of this study indicate that the relations between the timing of puberty and adolescent mental health are not universal. Early maturing white girls evidenced greater difficulties with eating and self-esteem, as did late maturing white boys. However, no differences in mental health were found for African-American adolescents as a function of pubertal timing.

Of particular interest is the finding that early maturing African-American girls are the “earliest of the early” in this sample. Theory would suggest that they might evidence greater psychological distress than the white girls, as they are the first to enter puberty and thus the most “off-time.” The fact that their mental health is not affected by maturational timing contradicts stage-termination theories which explain early pubertal maturation as problematic because it occurs within an individual not yet emotionally or cognitively developed enough to cope with these physical changes.

Rather, the finding suggests that there are differences in the social experiences and expectations for these groups of girls. Pubertal development for some girls may be a welcome event coupled with more control, acceptance in adult or peer culture, or ascendance in status at home and in the broader community. Differences in social class, parental expectations about adolescence, or messages and preparation the adolescent receives regarding development could be aspects of the social/cultural environment useful to investigate in future studies.

The finding that late maturing white boys are less angry highlights the need to consider both timing and status effects of puberty on mental health. The late maturing white boys’ lower anger scores could be a function of having not entered puberty yet, as increased anger may be a function of both hormonal changes and increased conflicts and demands for independence which typically accompany maturation. As with the girls, however, the non-replication of the findings with African-American boys suggests that there may be differences in the social/cultural environments which serve to change the relation between pubertal timing and mental health.

Overall, results highlight the need to attend to both social and psychological contexts in which pubertal development occurs. Pubertal timing effects do not appear to be universal, although the particular aspects of the context which serve to alter this relationship remain speculative.

