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Early pubertal timing and adult adjustment outcomes: Persistence, attenuation, or accentuation?

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ABSTRACT

Early pubertal timing is associated with internalizing and externalizing problems during adolescence. However, few studies explicitly test whether early puberty is especially problematic for those with pre-existing problems (i.e., accentuation) and little is known about whether the negative correlates of early pubertal timing persist past young adulthood. We address these questions using longitudinal data from up to 451 participants in the Iowa Youth and Families project (e.g., Ge, Conger, & Elder, 1996, 2001). We replicated and extended previous results reported for this sample during adolescence (e.g., early maturing boys and girls reported more substance use) and found some evidence for accentuation in adolescence for psychological distress and substance use. However, correlations between early puberty and adult outcomes assessed up to two decades later were largely indistinguishable from zero including attenuation effects. These results suggest that any negative correlates of early pubertal timing are attenuated by the fourth decade of life.

1. Introduction

Adolescents who experience puberty earlier than their same-sex and same-age peers (i.e. early pubertal timing) report higher rates of depression, anxiety, hostility, delinquency, substance use, and precocious sexual activity than their later maturing peers (e.g., Baams, Dubas, Overbeek, & van Aken, 2015; Brooks-Gunn, Warren, Rosso, & Gargiulo, 1987; Dimler & Natsuaki, 2015; Flannery, Rowe, & Gulley, 1993; Ge, Kim, Brody, Conger, Simons, Gibbons, & Cutrona, 2003; Mendle & Ferrero, 2012; Mendle, Turkheimer, & Emery, 2007; Negri & Susman, 2011; Ullsperger & Nikolas, 2017; White, Deardorff, & Gonzales, 2012). Although recent work has questioned whether the effect sizes associated with early timing are large enough to warrant public concern (Smith-Woolley, Rimfeld, & Plomin, 2017), there is consistent evidence that early pubertal timing is associated with a range of negative outcomes in adolescence. Important remaining questions concern whether early puberty primarily accentuates tendencies toward problematic behavior (e.g., Caspi & Moffitt, 1991) and whether the correlates of early pubertal timing persist across the life span (e.g., Boden, Fergusson, & Horwood, 2011; Copeland et al., 2010; Natsuaki, Biehl, & Ge, 2009; Stattin & Magnusson, 1990). This paper addresses these questions using data from the Iowa Youth and Families project, a longitudinal study that has followed focal participants from approximately ages 13 to 35 (e.g., Conger & Conger, 2002; Ge, Conger, & Elder, 1996, 2001).

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2. Early pubertal timing and adolescent development

Although a number of perspectives attempt to account for the association between early pubertal timing and adolescent outcomes (e.g., Caspi & Moffitt, 1991; Ge & Natsuaki, 2009; Smith-Woolley et al., 2017; Ullsperger & Nikolas, 2017), the developmental readiness hypothesis appears to have the strongest support. This account posits a linear association between early pubertal timing and negative outcomes. The gist of this explanation is that adolescents who experience puberty earlier compared to their later maturing peers are not as prepared for the social and emotional demands that accompany this transition.

One modification to the developmental readiness hypothesis is the possibility that the experience of early puberty is primarily problematic for youth who are already showing signs of distress (e.g., Caspi & Moffitt, 1991). This is known as the *accentuation* hypothesis (see also Ge & Natsuaki, 2009), which asserts that early pubertal timing is a stressful transition that reinforces and magnifies existing behavioral and emotional tendencies. The first evidence for the accentuation hypothesis was provided by Caspi and Moffitt (1991) who found that early maturing girls with a history of childhood behavior problems at age 9 experienced the most adjustment difficulties throughout adolescence. Further tests of the accentuation hypothesis have been limited due to data requirements needed to test this idea including the need for earlier measures of distress (see Ge & Natsuaki, 2009). Nonetheless, the accentuation hypothesis is an important qualifier of the developmental readiness hypothesis.

Gender is often considered important when evaluating the impact of early pubertal timing on developmental outcomes (e.g. Ullsperger & Nikolas, 2017). Many classic studies focused exclusively on girls and popular discussion often emphasizes the impact of early puberty on girls (Deardorff & Greenspan, 2014). However, studies that have evaluated the impact of early pubertal timing in boys and mixed-sex samples tend to find that early maturation is problematic for boys as well (e.g., Ge, Conger, & Elder, 2001; Smith-Woolley et al., 2017). Indeed, recent meta-analytic studies found no evidence for gender differences in the association between early pubertal timing and adolescent externalizing problems (Dimler & Natsuaki, 2015) as well as adolescent psychopathology more broadly (Ullsperger & Nikolas, 2017). Thus, the general findings about the negative correlates of early pubertal timing appear to apply to both girls and boys; and, we test this issue in the current study. Indeed, Cohen, Cohen, and Brook (1995) suggest that researchers should directly test for gender differences rather than separately analyze data for males and females in the absence of statistical evidence for gender differences.

3. Long-term impact of early pubertal timing

When compared to the evidence that early pubertal timing is associated with negative outcomes during adolescence, relatively little is known about long-term impacts of early puberty beyond adolescence and young adulthood. Stattin and Magnusson (1990) remarked about a shortage of studies on the long-term impact of puberty and little has changed in the last quarter-century (see Copeland et al., 2010). For example, Dimler and Natsuaki (2015) noted there was “limited knowledge regarding the long-term effect of early pubertal timing” (p. 162). Copeland et al. (2010) outlined two hypotheses about the long-term effects of early puberty - the *attenuation* and *selective persistence* hypotheses.

The attenuation hypothesis predicts that the impact of early puberty weakens in adulthood, likely because of general developmental trends toward increases in psychological health and personality maturity during the transition to adulthood (e.g., Caspi, Roberts, & Shiner, 2005; Galambos, Barker, & Krahn, 2006). In contrast, the selective persistence hypothesis predicts that early maturation has lasting general effects that pervades multiple areas of functioning. The idea behind this hypothesis is that early puberty increases the likelihood that adolescents encounter so-called snares (e.g., Moffitt, Caspi, Harrington, & Milne, 2002) such as addiction, teen parenthood, school drop-out, and arrest that decrease the probability of a successful transition to adulthood and heightens risks for adjustment difficulties across multiple outcomes.

The bulk of studies in the literature seem to support the attenuation hypothesis. For example, Boden et al. (2011) examined associations between age of menarche and psychosocial outcomes in early adulthood including antisocial behaviors, educational attainment, mental health outcomes, and sexual behaviors in a birth-cohort sample of New Zealand women. Aside from their finding that earlier menarcheal age was associated with an increased risk of pregnancy and sexually transmitted infections by age 18, Boden et al. (2011) suggested that links between age of menarche and risks of adverse outcomes by age 30 are small to nonexistent. Copeland et al. (2010) tested associations between pubertal timing and psychosocial outcomes at age 21 for women including crime, substance use, peer problems, family relationships, sexual behavior, mental health, and education/SES. Early puberty was not associated with any negative outcomes with the exception of a significant interaction between pubertal timing and adolescent conduct disorder predicting depression during young adulthood.

These recent findings about longer-term outcomes associated with early pubertal timing are consistent with the classic work by Stattin and Magnusson (1990) who studied a sample of Swedish women and examined outcomes regarding family life, education, work, social support, personality, criminal offenses, and substance use measured when their sample participants were at about 25 years of age. Aside from noting that only 2% of the early maturing women (those whose menarcheal age was before 11) entered college or university compared to 12–15% of the later maturing women, there were few indications of lasting effects. Stattin and Magnusson remarked that “no convincing relationship between menarcheal age and adult social maladjustment was established” (Stattin & Magnusson, 1990, p. 340).

Boden et al. (2011), Copeland et al. (2010), and Stattin and Magnusson (1990) are notable for the breadth of constructs they assessed but their focus was limited to women. The longer-term studies that have used mixed-sex samples tend to find mixed results. Natsuaki et al. (2009) found evidence of attenuation for outcomes like depression whereas Graber, Seeley, Brooks-Gunn, and Lewinsohn (2004) found more complicated results. They reported evidence consistent with attenuation for males followed to age 24

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