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Evening adolescents: The role of family relationships and pubertal development

Juan Francisco Díaz-Morales [a,*], Cristina Escribano [a], Konrad S. Jankowski [b], Christian Vollmer [c], Christoph Randler [c]

[a] Complutense University of Madrid, Campus de Somosaguas, s/n, 28223 Madrid, Spain
[b] Faculty of Psychology, University of Warsaw, Poland
[c] University of Education Heidelberg, Germany

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ABSTRACT

Accumulating evidence suggests that evening-type adolescents are exposed to a number of determinants that might have a negative impact on their health condition. Despite the fact that biological and psychosocial factors are interrelated, their impacts on the shift toward eveningness during puberty have been considered only separately. In this study, the effects of frequency of conflicts and functional autonomy on the relationship between pubertal development and Morningness–Eveningness (M–E) were tested together. A sample of 2081 adolescents aged 12–16 completed pubertal development, M–E, family frequency of conflicts and functional autonomy scales. Results indicated that greater functional autonomy and more conflicts in the family were unique predictors of greater eveningness, and they both together were better predictors of M–E than an advanced age and pubertal development. Apart from biological development, family relationship seems an important factor explaining progressive tendency toward eveningness during puberty and adolescence. Some implications to adolescent development were indicated.

Introduction

One striking phenomenon of the human circadian rhythm is a shift in Morningness–Eveningness (M–E) or preferred sleep timing twice during each individual's life. First, there is a shift toward eveningness during the age of puberty, and second, a shift back toward morningness, which could be viewed as a biological marker of the end of adolescence (Roenneberg et al., 2004). After reaching adolescence, most people gradually become more and more morning-types (Hur, 2007). However, this increase to morningness during adulthood might also be triggered by social and environmental factors (i.e. *zeitgebers*) such as work timetables, family responsibilities, physical exercise and natural light exposition, temperature or latitude (Adan et al., 2012; Wittmann, Dinich, Merrow, & Roenneberg, 2006).

Extreme evening orientation has been considered as a risk factor to health in a society which tends to be oriented toward morning. Accumulating evidence suggests that evening-type adolescents are exposed to a number of determinants that might have a negative impact on their health condition (Delgado, Díaz-Morales, Escribano, Collado & Randler, 2012;

* Corresponding author.
E-mail address: juanfcodiaz@psi.ucm.es (J.F. Díaz-Morales).

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Tzischinsky & Shochat, 2011) and also to lower life satisfaction further in life span (Díaz-Morales, Jankowski, Vollmer, & Randler, 2013). Among adolescents, evening preference has been associated with an array of disturbances including emotional problems (Gaina et al., 2006), eating disorders (Schmidt & Randler, 2010), behavioral and health risk difficulties (Gau et al., 2007), poor physical and mental health, low self-esteem, and negative family relationship and school functioning (Randler, 2011).

While increasing age in adulthood is associated with a greater tendency toward morningness (Di Milia & Randler, 2013), younger people are likely to rate themselves as more evening-oriented (Carskadon, Vieria, & Acebo, 1993). This shift occurs around the age of 12–13 years, it has widely been described all around the world, and, consequently it has been considered that this change is based on biological changes throughout puberty (Hagenauer, Perryman, Lee, & Carskadon, 2009). Carskadon et al. (1993) showed that morningness was negatively related to puberty stage among girls, concluding that psychosocial factors were less influential, since the contact with older students at school or having older siblings was not related to M–E. In the same line, Hagenauer et al. (2009) concluded that social factors cannot completely account for the shift toward eveningness during adolescence given that: (1) a number of researches showed that bedtime delay was observed earlier in girls than in boys coinciding with their earlier pubertal development; (2) the shift toward eveningness is observed in several countries and cultures (but see West Africa, Borchers & Randler, 2012); (3) adolescents continue to show a delayed circadian phase even in laboratory studies where social influence is limited. At the same time, their circadian timing system becomes delayed and drives them to wake up later, and previous researches have proposed the influence of gonadal hormones on sleep patterns (Jenni, Achermann, & Carskadon, 2005). Also, in young adult men, higher testosterone was found in evening oriented men (Randler et al., 2012). However, psychosocial factors may also contribute to this change in M–E during adolescence, but evidence is scarce (Randler, Bilger, & Díaz-Morales, 2009; Takeuchi et al., 2001). For instance, data from West Africa show only a small change toward eveningness in adolescents (Borchers & Randler, 2012) which should be similar to studies from the northern hemisphere when biological factors could play an exclusive role.

However, although maturational changes exert an influence on the shift toward eveningness during adolescence (Steinberg, 2002), it cannot be excluded that such a shift is also affected by psychosocial factors. A variety of factors influence adolescents' sleep and their potential reciprocal interactions are complex. The possible influencing factors have been clustered into physiological (e.g., circadian pattern of melatonin secretion), psychiatric (e.g., affective disorders), socio-cultural and psychological factors (Brand, Gerber, Hatzinger, Beck, & Holsboer-Trachsler, 2009). Prior research has showed that lifestyle is related to sleep among adolescents. Activities such as attending sports, music concerts in the evenings and on weekends, socially desirable behavior such as going to bed later, employment alongside schooling, homework requirements, and the availability of television or internet may individually confer to differences in sleep patterns. For instance, physical activity in the morning has an impact on adolescents' sleep patterns and circadian rhythms (Kalak et al., 2012a) and regular physical activity was a protective factor against child–parent conflicts (Sigfusgottir, Asgeirsdottir, Sigurdsson, & Gudjonsson, 2011).

As adolescents get older, both their academic responsibilities and interest in night life increase, feeling independent from parental supervision, while the majority of high schools start earlier. All these psychosocial factors may contribute to the well-known shift toward eveningness during early and late adolescence (i.e. adolescents delay dramatically rise time and bedtime), and research could evaluate their relevance considering both biological and psychosocial measures together. This is especially important because the relationship between the delayed sleep–wake rhythm characteristic of adolescence period and psychological functioning has been considered bi-directional (Bajoghli, Alipouri, Holsboer-Trachsler, & Brand, 2013), or not only determined by biological factors. According to Takeuchi et al. (2001) several factors such as environmental (light and temperature), social (family life and school schedules), physiological (meal timing), and psychological (parental discipline about sleep habits) may act as *zeitgebers* of the sleep–wake rhythm of adolescents. During both childhood and adolescence bedtimes were decided by parents to a greater extent in a suburban district in Japan compared to the urban one. The above authors suggested that the family lifestyle characterized by agriculture and/or forestry, which requires earlier rise times, could attenuate the shift toward eveningness in the suburban district.

One important psychosocial factor related to sleep among adolescents is family functioning, which has not been intensively investigated. Bajoghli et al. (2013) compiled only twelve studies about the relation between adolescents' sleep and family functioning. Changes in the adolescents' sleep–wake rhythm were negatively related to parental involvement in shift-work, poor family climate, and familial stress. On the other hand, parenting styles, such as support and commendation, combined with absence of negative parenting styles such as reproach, restriction and inconsistency were associated with better sleep quality among the adolescents (Brand et al., 2009). There has been even shown a concordance between adolescents' and their parents' sleep and well-being (Kalak et al., 2012b). It seems that a positive home atmosphere favors high quality sleep among offspring (Tynjälä, Kannas, Levälahti, & Välimaa, 1999), and total sleep time increased with more restricted parental rules, such as earlier bedtime (Lemola, Schwartz, & Siffert, 2012). Increasing sleep time by parental monitoring might be of particular importance for adolescents, as its reduction might lead to health problems (Gangwisch et al., 2010). In this line, Randler et al. (2009) found that parental monitoring showed an influence on chronotype measured by midpoint of time in bed: higher bedtime discipline was associated to earlier sleep timing, whereas those adolescents who decided about their bedtime reported shorter sleep onset latency. Age was a stronger statistical predictor of M–E than pubertal development or parental monitoring, but both were significant predictors of sleep timing suggesting that psychosocial factors could be influential on M–E and coupled to the biological ones.

These findings suggest that quality of family life is related to adolescents' sleep. Parents' and adolescents' personalities and behavior exert a significant impact on the quality of their mutual relationships (Denissen, van Aken, & Dubas, 2009). However