

Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

Journal of Adolescence

journal homepage: www.elsevier.com/locate/adolescence

Sleep, low self-control, and deviance: Direct and indirect links across immigrant groups and socioeconomic strata



Alexander T. Vazsonyi*, Gabriela Ksinan Jiskrova, Albert J. Ksinan

Department of Family Sciences, University of Kentucky, 316 Funkhouser Building, Lexington, KY, 40506, United States

ARTICLE INFO

Keywords:

Sleep problems
Sleep quantity
Low self-control
delinquency

ABSTRACT

Sleep functioning is concurrently and longitudinally associated with norm-violating behaviors; however, the specific correlates contributing to these links remain unknown. Moreover, despite known mean-level differences in sleep functioning across immigrant and non-immigrant youth as well as socioeconomic strata, it is largely unknown whether links between sleep and norm-violating behaviors vary across groups. The current study tested the direct effects of sleep problems and sleep quantity on measures of deviance, as well as the indirect links via low self-control. It also tested moderating effects by immigrant and SES groups, indicated by parental education, on the associations and mean-level differences in sleep functioning. Results from structural equation models based on cross-sectional data from a national probability sample of Swiss adolescents ($N = 6,866$) provided evidence of both direct as well as indirect links between sleep and deviance, via low self-control. Despite mean-level differences, the tested links were invariant across immigrant and SES groups, with one modest exception in the magnitude of effect.

Sleep functioning has been repeatedly found to predict externalizing behaviors in adolescents, both concurrently and longitudinally (Astill, Van der Heijden, Van IJzendoorn, & Van Someren, 2012). Given the robustness of these links, efforts have focused on understanding how lack of sleep or sleep difficulties translate into higher rates of norm-violations and deviance. To date, several candidate pathways explaining this link have been proposed. First, some proportion of the association between sleep patterns and adolescent adjustment is attributable to genetic factors (Barclay, Eley, Maughan, Rowe, & Gregory, 2011); however, this does not fully account for the sleep-adjustment link (Barnes & Meldrum, 2015; Matamura et al., 2014), leaving some variance to be explained. Second, Kouros and El-Sheikh (2015) found that unfavorable sleep patterns predicted externalizing behaviors in adolescents via daily mood disruptions. Third, several physiological factors such as vagal tone (El-Sheikh, Erath, & Keller, 2007) and the behavioral activation system (Hasler, Allen, Sbarra, Bootzin, & Bernert, 2010) have been found to mediate the sleep functioning-adjustment link. Lastly, as sleep functioning has been shown to predict executive functioning (Astill et al., 2012), some research has provided evidence that self-control or self-regulation mediates the link between sleep functioning and measures of norm-violating or externalizing behaviors (Meldrum, Barnes, & Hay, 2015; Peach & Gaultney, 2013).

The present study tested low self-control as mediator in the link between sleep functioning, operationalized as sleep problems and sleep quantity, and deviance in a large, cross-sectional, national probability sample of Swiss adolescents. Additionally, because sleep functioning has been found to be associated with minority and socioeconomic status (SES; Grandner, Williams, Knutson, Roberts, & Jean-Louis, 2016), the study tested whether these links varied across immigrant groups and socioeconomic strata.

* Corresponding author. University of Kentucky, Department of Family Sciences, 316 Funkhouser Building, Lexington, KY, 40506, United States.
E-mail address: vazsonyi@uky.edu (A.T. Vazsonyi).

<https://doi.org/10.1016/j.adolescence.2018.06.002>

Received 9 November 2017; Received in revised form 15 May 2018; Accepted 5 June 2018

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1. The role of self-control

Several studies have examined whether poor sleep (i.e., short sleep duration and sleep problems) has been associated with facets of executive functioning, including low self-control. Based on previous cross-sectional studies, higher subjective sleepiness (but not sleep duration) was associated with poorer executive functioning in adolescents (Anderson, Storfer-Isser, Taylor, Rosen, & Redline, 2009). Similarly, Owens, Dearth-Wesley, Lewin, Gioia, and Whitaker (2016) found that daytime sleepiness was associated with executive functioning, while sleep duration was not. In contrast, Kuula et al. (2018) reported some effects of sleep duration on performance of behavioral tasks that focused on executive functioning in an adult sample. The authors did not find an effect of sleep duration on self-reported, trait-like executive functioning. However, in another study by Kuula et al. (2015), sleep problems and lack of sleep were associated with poorer performance in tasks measuring executive functioning.

Longitudinal studies of the relationship between sleep functioning and facets of executive functioning, including self-control, are rare; however, the existing ones found some support for the relationship. Children with a greater decline in sleep problems during childhood were found to have higher executive control in late adolescence (Friedman, Corley, Hewitt, & Wright, 2009); additionally, Williams, Nicholson, Walker, and Berthelsen (2016) reported that classes of children with attentional and emotional regulation problems were characterized by escalating sleep problems during childhood. Two experimental studies showed that lower sleep duration was associated with an increased emotional lability and restless-impulsive behavior in children (Gruber, Cassoff, Frenette, Wiebe, & Carrier, 2012) and greater risk-taking on a behavioral task in young adults (Rossa, Smith, Allan, & Sullivan, 2014).

Low self-control (Gottfredson & Hirschi, 1990) has been consistently found to be positively associated with a variety of norm-violating behaviors, including alcohol use, drug use, delinquency, and deviance (Vazsonyi, Mikuška, & Kelley, 2017). Hence, it is reasonable to expect that the links between unfavorable sleep functioning and measures of deviance might be partly attributable to low self-control. Two previous studies have tested this hypothesis. Based on the National Longitudinal Study of Adolescent Health (Add Health) sample, Peach and Gaultney (2013) found that short sleep duration and late bedtimes directly predicted delinquency; late bedtimes indirectly predicted delinquency via impulsivity and sensation-seeking, both facets of low self-control according to Gottfredson and Hirschi (1990). Meldrum et al. (2015) examined this question in a longitudinal sample of middle to late adolescents. They found that sleep problems predicted low self-control; in turn, low self-control predicted higher delinquency, and the relationship between sleep problems and delinquency was mediated by low self-control. This provides some support for the link between sleep functioning and delinquency, via self-control.

2. Links between ethnic and immigrant minorities, socioeconomic strata, and sleep

Given the known health disparities among ethnic, racial, immigrant minorities and youth part of different socioeconomic strata, some authors have examined whether these disparities are associated with poor sleep functioning (Anujoo et al., 2014; Carnethon et al., 2016; Petrov & Lichstein, 2016). Results from these studies confirmed that ethnic/racial minority status and socioeconomic disadvantage were associated with poor sleep in adult samples from the United States (Carnethon et al., 2016; Chen et al., 2015; Grandner et al., 2016; Petrov & Lichstein, 2016) and Europe (Anujoo et al., 2014).

Studies focusing specifically on immigrant populations have found inconsistent results, where some provided evidence that immigrants reported poorer sleep than members of the majority populations in the United States (Ertel, Berkman, & Buxton, 2011) and in Europe (Steiner, Johansson, Sundquist, & Wändell, 2007; Taloyan, Johansson, Johansson, Sundquist, & Koctürk, 2006), while others reported better sleep among first generation immigrants (Seicean, Neuhauser, Strohl, & Redline, 2011; Whinnery, Jackson, Rattanaumpawan, & Grandner, 2014). Other studies did find differences in sleep functioning between immigrant and non-immigrant or majority groups (Clever & Bruck, 2013; Villaruel & Artazcoz, 2017).

Disparities in sleep functioning have also been found in child and adolescent samples. Ethnic/racial minority children and children living in areas with high neighborhood distress experienced poorer sleep functioning than their European American peers or than children living in safer, more affluent neighborhoods (Combs, Goodwin, Quan, Morgan, & Parthasarathy, 2016; Daniel, Grant, Chawla, & Kothare, 2010; Moore et al., 2011; Spruyt, Anguh, & Nwabara, 2014).

It is important to note that the vast majority of studies examining the relationship between sleep and ethnic, racial, or immigrant minority membership or socioeconomic strata were focused on studying mean-level similarities or differences. Although these studies have greatly contributed to our understanding of disparities in sleep functioning across groups, it is essential to test how ethnicity, race, immigrant, and socioeconomic status (SES) moderate the associations between sleep functioning and adjustment. For example, El-Sheikh, Kelly, Buckhalt, and Hinnant (2010) found that the association between poor sleep and poor adjustment was stronger in African-American children and children from lower SES households, in comparison to their peers. Based on the same sample, Philbrook, Hinnant, Elmore-Staton, Buckhalt, and El-Sheikh (2017) found that the link between sleep functioning and cognitive functioning was moderated by children's ethnic/racial group membership.

3. The current study

The current cross-sectional study tested the associations between sleep functioning (sleep problems and quantity), low self-control, and deviance, in a nationally representative sample of Swiss adolescents. More specifically, it tested both mean-level similarities or differences in sleep problems and quantity across immigrant groups and socioeconomic strata (indicated by parental education), but also whether immigrant and socioeconomic strata moderated the associations between sleep functioning, self-control, and deviance.

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