The urge to sleep is one of our most demanding needs and the common observation that sleepiness is irresistible leads to the putative conclusion that sleep is a necessity (Carlson, 2001). Sleep consistency or the amount of sleep a person obtains relative to the amount they desire to obtain, however, appears to be declining among college students. In 1978, 24.4% of college students reported dissatisfaction in sleeping patterns; 10 years later, 53.4% were dissatisfied with their sleeping patterns (Hicks, Mistry, Lucero, Lee, & Pellegrini, 1989). In this study, 147 college students out of a sample of 782 (18.8%) reported they reliably slept for 7 to 8 hr per night for 5 or more years. In 1992 only 83 college students out of a sample of 451 (18.4%) slept 7 to 8 hr reliably for 1 to 5 years and only 50 students (11.09%) slept the same amount of time for 5 or more years (Hicks, Johnson, & Pellegrini, 1992). According to Hicks and Pellegrini (1991), in 1969 the median hours of sleep for college students was 7.75 hr, decreasing in 1979 to 7.13 hr and decreasing further to 6.75 hr by 1989. Mean sleep duration was found to be 7.30 hr, ($SD = .86$) in 1978, which had decreased to a mean of 6.82 hr, ($SD = 1.04$) in 1988 (Hicks, et al., 1989). These data represent a decline in the amount of sleep and self-reported sleep consistency over recent decades.

The National Sleep Foundation (2002) study of 1,010 adults who were 18 years or older reported that the amount of sleep for individuals had not changed in the years 1998 to 2002, however that study encompassed many age groups, not just college students. It can be tentatively argued that sleep consistency and length may be decreasing in college students but not among the general adult population. The present study was designed in part to examine this possibility.

As to why sleep duration could be decreasing, insomnia might be partly responsible. In recent years, 68% of adults 18 to 29 years of age reported having experienced insomnia a few nights a week (National Sleep Foundation, 2002). This is a higher percentage relative to adults aged 30 to 64 (59%) or adults 65 years or older (44%). Currently, between one third to one fourth of the adult population suffers from insomnia at least occasionally and 9% of the popula-

Author note: The authors would like to thank Dr. Debra Spear and Dr. Virginia Norris as well as two anonymous reviewers for their comments on earlier drafts of this paper.

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Average Sleep Times Among Undergraduate College Students

Psychology students (N = 996) were instructed to record in an informal sleep diary the time they went to bed, the time they awoke, and the time they set the alarm over a period of either 5, 7, 10, 20, or 25 nights in an attempt to measure sleep length among a college student population. The average amount of sleep among our participants was 7.69 hr, approximating another study (Kripke, Garfinkel, Wingard, Klauber, & Marler, 2002) which found an average sleep length of 7 hr.
tion suffer from insomnia regularly (Ancoli-Israel & Roth, 1999; National Sleep Foundation, 2002). This condition not only affects the amount of sleep obtained each night, but it also creates problems in work production, psychological dysfunction, and mortality (National Commission on Sleep Disorders Research, 1993). In support of this view, the National Sleep Foundation (2002) also found that 44% of the adult participants experienced interference of daily activities at least a few days a month due to daytime sleepiness.

Since the last sleep duration research focusing on college students was completed over a decade ago and to extend the earlier research of sleep length with a college population, the present study examined sleep length over a multi-year period among students at South Dakota State University. Our purpose was to verify the sleep patterns of current college students relative to prior studies and to see if mean sleep length had further decreased relative to the earlier studies.

Method

Participants

In the present study, participants (N= 996) were either college students in an introductory psychology course or students in upper division psychology courses (males = 383, females = 613) in the years 1997-2000 at South Dakota State University (SDSU). All participants were compensated with extra credit points in their respective classes. Demographic data for the participants was assumed to closely mirror the present-day demographics of the SDSU student population; however, actual demographic data for the participant pool was only reported by a small fraction of participants and we cannot conclude the participants are a truly random sample of the typical student population at South Dakota State University. Females were more likely to be enrolled in psychology courses than were males, a trend seen nationally (Denmark, 1998). In the fall of 2002, the student body was 52.5% female and 47.5% male. Ethnicity data for SDSU students was as follows: 98.3% of the student body was White/Caucasian, 1.0% American Indian/Alaska Native, 0.05% African-American/Black, 0.05% Native Hawaiian/Pacific Islander, and 0.07% other. In the population of new students at SDSU in the fall of 2002, 97% graduated from high school in 2002.

Design and Procedure

Participants were instructed to maintain a sleep diary, reporting data on the time they went to bed (hour and minute, e.g., 11:35 p.m.), the time they awoke and stayed up and awake for the day (e.g., 8:45 a.m.), and the point in time they had set their alarms as the intended awakening time (e.g., 8:45 a.m.) in a self-report method. Naps were not included in data collection and mid-sleep period awakenings due to extraneous variables (hunger, thirst, urination, etc.) were not defined as awakening for the day. Naps were not included so that the primary intended sleep period was the data of interest; naps may supplement a person’s total amount of sleep but are not typically the main sleep period of most persons. All participants were instructed to make all observations of these times with the same clock. The sleep reports were measured over a period of 5 (n = 550), 7 (n = 213), 10 (n = 111), 20 (n = 39), and 25 (n = 83) consecutive nights. The different numbers of observations is largely due to participant choice. Most participants were willing to monitor the sleep for a five day school week. When weekend nights and longer periods of observation were requested, far fewer participants were willing to participate and the compensation rate for extra credit points was perceived as less favorable by most participants. The different number of observations were collected to see if the typical five day school week was imposing on a participant’s desired or sought after amount of sleep. The extended observation periods were collected to look for periods when sleep might have been altered by a short term period of high demand such as a series of midterm exams. It was hoped that these different intervals of sleep observations could be used to reveal trends in the data and to increase external validity. Since, however, few participants were willing to monitor and record their sleep on weekends and for longer periods of time than five days, these data are not included in our analysis.

The total hours of sleep were identified per participant, per sleep period, and averaged for the respective groups of males or females and number of days of data collection. The raw data were given to different researchers for calculating the average sleep length and agreement across different researchers for these calculations was found to be 89.65%. Interrater agreement rates of over 80% are considered acceptable (Kazdin, 1982). Errors in calculation were subsequently corrected.

Results

Our results are reported in terms of both the mode and an overall mean. Although our participants reported on their sleep for different intervals, the most frequently reported length of sleep was not significantly different for the different groups based on a two sample t test. The mean sleep length for the different groups also overlapped greatly. As a result, the data are discussed here only in an aggregate sense. The most frequently reported sleep length (the mode) for males and females in terms of whole hour blocks
was 7 to 8 hr per night \( (n = 381) \); an overall average of all participants was found to be \( M = 7.69 \), \( (SD = 0.99) \). The second most common sleep length obtained in terms of whole hour blocks was 8 to 9 hr \( (n = 286) \). The third most common amount of sleep was 6 to 7 hr \( (n = 198) \). The number of participants who reported their length of sleep above 8 to 9 hr \( (n = 92) \) and less than 6 hr \( (n = 38) \) was substantially less. A two sample \( t \) test was calculated to compare the actual difference between the sleep length of males and females. There was a slight difference in the amount of sleep of male participants \( (M = 7.63 \text{ hr}, SD = .97) \) and female participants \( (M = 7.73 \text{ hr}, SD = 1.00) \) but this difference was not statistically significant \( t(df = 994), p > .05 \). Since the participant pool included far more females than males, Figure 1 presents the percentages of males and females reporting the differing sleep lengths (see Figure 1). Although the present data on gender differences were not statistically significant, the present data do resemble other findings. The National Sleep Foundation (2002) reported that males were less likely to sleep as long as females \( (6.7 \text{ hr versus } 7.0 \text{ hr respectively}) \) although the difference was not as small. While the difference found between males and females in the present study was small, approximately 6 min, the difference found between the sexes in the 2002 study was substantially more, approximately 18 min.

**Discussion**

The present data add to and clarify the results of other studies on length of sleep in college students. The results of this study showed that the mean length of sleep was 7.69 hr for both males and females and the modal length of sleep was between 7-8 hr in terms of whole-hour blocks. In 1978, the mean reported length of sleep was 7.30 hr, and in 1988, participants slept for 6.82 hr as the mean reported sleep length (Hicks, Mistry, Lucero, Marical, & Pellegrini, 1990). The present data would tend to indicate that average sleep length has not decreased as predicted by earlier studies and the average sleep length has actually increased substantially, at least as reported by the present participants. The difference between the present mean and the 1978 or the 1988 mean cannot be tested for sta-
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Statistical significance as the 1990 publication does not report sufficient measures of dispersion.

The reason for the most common amount of reported sleep being approximately 8 hr (M = 7.69 in the present study) was likely due to the age of the participants (Carskadon & Dement, 1987). These researchers found that as individuals age, they tend to engage in less sleep. In pre-adolescent children, the average sleep time is 10 hr whereas an individual who is in their late teens is averaging about 7 hr of sleep. There could be many reasons for decreased sleep among late adolescents and young adults such as the increased demand of academic interests and high expectations, not to mention social activities (e.g., “partying” and non-social actions such as playing video games and Internet use by college students. In addition, basic physiological changes could be responsible for the decrease (Carlson, 2001.)

There are many other factors to consider that might affect the length of sleep of students such as demands from school and social activities. It is likely that work and study schedules influence the amount of sleep a student obtains (Medeiro, Mendes, Lima, & Araujo, 2001). The more time that a person spends working, studying or in active recreation, less time is subsequently available in which to sleep, although specific actions of a participant can alter slow wave sleep duration (Horne & Minard, 1985) or rapid-eye movement sleep (REM) duration (Smith & Lapp, 1991). That is to say, different activities during the waking hours such as demanding physical tasks versus a high mental demand can alter the relative percentages of slow wave sleep and or REM sleep in a subsequent sleep period.

The current data have the limitations of any survey or study based on participants’ self-report, including issues of truthfulness, and the fact that these are retrospective data and therefore based on the participant’s ability to remember. The validity of such self-reported measures may be questionable due to reactivity by participants (Kazdin, 1982). The fact that the participants were self-monitoring may have altered their sleep habits. Studies of sleep conducted outside of a laboratory necessarily rely on self-report as it is almost impossible to conduct a study such as this without the self-report of participants. Although these participants used a non-standardized instrument in the form of a sleep diary, the use of instruments such as the Daily Sleep Questionnaire (Munroe, 1967) have been used and also suffer from lack of standardization and possible reactivity (Ascher & Gilligan, 1988). Other studies, however, have found sizable positive correlations between sleep laboratory recordings and participant’s self-reported measurements of sleep (Bootzin & Engle-Friedman, 1981). The 2002 study by the National Sleep Foundation cited herein is itself a self-report survey of sleep habits. The use of sleep diaries to have participants record their sleep behaviors is not necessarily a fatal flaw in the current study and will likely have to be used in such studies in the future.

Studies of sleep length such as the present study are important and informative for a number of reasons. Without adequate sleep, workers are much more at risk for industrial accidents. Most industrial accidents occur on the overnight shift (e.g., “the graveyard shift”) when the demand for sleep is likely greatest. Also, insomnia has been correlated with lost time at work, symptoms of depression, and increased risk of various health problems (Benca, 2001; Simon & VonKorff, 1997). Sleep length has been correlated with mortality rates in a number of studies (Kripke, Simons, Garfinkel, & Hammond, 1979; National Commission on Sleep Disorders Research, 1993). The amount of sleep that any person obtains is very basic biological data with significant implications far beyond the bedroom.

### References


