

Dear Tired in Topeka,

Your mother-in-law is right; your children probably do need more sleep than they are currently getting in order to optimize their cognitive development. Children and adolescents need more sleep than adults, and sleep influences their cognitive development in several different ways. First, sleep is important for feeling one's best, rather than moody, irritable, and uncooperative (Spruyt, Aitken, So, Charlton, Adamson, & Horne, 2008; Jung, Molfese, Beswick, Jacobi-Vessels, & Molnar, 2009; Wolfson & Carskadon, 1998). Second, sleep promotes learning by facilitating concentration and reducing distractedness (Jung et al., 2009). Finally, the process of sleep itself improves memory, pattern recognition, and other aspects of learning. (Gomez, Bootzin, & Nadel, 2006; Backhaus, Hoeckesfeld, Born, Hohagen, & Junghanns, 2008).

According to Spruyt and colleagues (2010) infants who slept longer at night had better temperaments and general development. Long daytime naps were no longer necessary for infants by the time they reached 12 months of age. This study did not find a direct correlation between performance on cognitive tests and sleep duration. However, a baby with a more easy-going temperament will be more open to new experiences and stimuli, and could experience faster cognitive development because of this.

For older children, the affects of sleep on learning are clearer. Preschoolers, between the ages of three and five, need at least ten hours of sleep per night in order to learn at their optimal level. (Jung et al., 2009). In one study, children were given cognitive test at the beginning and end of the semester; those who slept longer per night made greater gains in score. They also had lower rates of problem behaviors that can interfere with learning, such as inattentiveness and low frustration tolerance. For adolescents, aged about ten to nineteen, students who slept longer had better moods, better attitudes toward school, and better grades (Meijer, 2008; Wolfson & Carskadon, 1998). Students said themselves that they needed about nine hours of sleep in order to feel their best (Wolfson & Carskadon, 1998). Students with As and Bs slept about eight and a half hours on school nights. Similarly to preschoolers, middle and high school students who got less than sufficient sleep experienced negative moods and problem behaviors, such as arriving late to class on a regular basis.

Sleep also seems to have a more direct impact on cognition. Two studies, one by Gomez and colleagues (2006) and one by Backhaus and colleagues (2008), support this conclusion. In the first study, fifteen-month-olds were exposed to an invented language with clear relationships between some of the words: one specific sound always came before a word, a second sound always followed it (Gomez, Bootzin, & Nadel, 2006). The infants were exposed before either their regular naps or times of day when they would be awake. In a test four hours later, infants who slept seemed to remember the language better, and to generalize the word relationship rules to sounds they had not heard before. This study showed that sleep improves pattern recognition, abstraction, and generalization, as well as memory. The second study tested the memory of older children, ages nine to twelve (Bauckhaus et al., 2008). The children read a list of words, and were tested before and after they slept. Significantly, the children's memory always improved after they slept, even though some children went to bed immediately after reading the word list, others eight hours later. This indicates that it was not the passage of time which helped, but something about the sleep itself.

These studies indicate not only the importance of sleep for learning, but specific recommendations for each age group. Young infants, those under one year of age, should have long nightly sleep as well as long naps during the day. Around one year, diurnal naps can be reduced. Preschool-aged children need at least ten hours of sleep per night, while adolescents

should receive nine or close to nine. Children and adolescents who receive sufficient sleep experience many benefits besides improved memory and cognitive functioning. They also feel more alert and have better moods and behavior, all of which are important for the process of learning.

Works cited:

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