

“The Economics of Sleep: An Intertemporal Model of Sleep Choice,” just beginning (joint with James Cardon, Eric Eide & Mark Showalter)

The issue of sleep has received relatively little attention in economics despite the fact that nearly a third of a person’s life is spent in slumber. Results from other disciplines suggest that sleep affects productivity and the quality of life in general (Webb, 1993). Sleep patterns appear to have a genetic component, but individual choice also plays an important role (Webb, 1993; Benca, 1993; Partinen et al, 1983). Our research uses a ‘rational-choice’ framework to explore the interplay between individual choice and the body’s innate need for sleep.

Existing models of sleep rely on a biological model of human behavior, ignoring that individuals have some control over the timing of sleep, and to a more limited degree, the ‘typical’ amount of sleep they consume. This choice aspect of sleep is often on display in stress situations such as students ‘cramming’ for exams, medical residents working extended shifts, or individuals rushing to meet a work deadline. Adjusting to “jet-lag” is another common experience where choice comes into play. These intertemporal choices have fueled a large market for sleep-inducing and sleep-preventing pharmaceutical products.

Previous economic research on the topic of sleep has used very simple, static models of choice (Biddle and Hamermesh (1990)). Our research uses computer simulation to solve a dynamic model of intertemporal sleep choice. Previous mathematical models of sleep originate in biological and medical disciplines and do not account for the ability people have to choose, to some degree, the quantity and quality of sleep. We use our framework to explore issues of worker productivity, the development of human capital over time, and the use of sleep-aid and sleep-preventing products. Our computer simulation model follows the pattern used in Cardon and Showalter (2007) which examines a complex dynamic model of health expenditures calibrated to match observable behavior. We calibrate our model using the American Time Use Survey.