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Weekly, technical and administrative work hours: Relationships to the extent R&D professionals innovate and help manage the innovation process

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ABSTRACT

An exploratory study of 2308 R&D professionals working for U.S. based laboratories belonging to 24 large corporations finds inverted-U relationships between the technical, administrative and total hours R&D professionals work per week and the extent they innovate and help manage the innovation process. These relationships suggest that R&D professionals can increase the extent they accomplish these performance objectives by working up to an optimal number of weekly hours and by combining technical hours with up to an optimal number of administrative hours. When R&D professionals work 60 weekly hours by combining 50 technical hours with 10 administrative hours, they maximize the extent they innovate. When R&D professionals work 60 weekly hours by combining 35 technical hours with 25 administrative hours, they maximize the extent they help manage the innovation process. The implications of these findings for having R&D professionals increase the extent they accomplish these performance objectives and, therefore, develop their careers, are discussed.

1. Introduction

In today's highly competitive business environment, innovation is a key source of competitive advantage for many organizations, which delegate substantial responsibility for the innovation process to the R&D laboratory. A primary responsibility of R&D professionals is to innovate. A secondary, but increasingly important responsibility of R&D professionals is to help manage the innovation process (Farris & Cordero, 2002; Jackson, 1998; Levi & Slem, 1995; Reynes, 1999; Waterman, Waterman, & Collard, 1994). Thus, two important performance objectives of R&D professionals are to innovate and to help manage the innovation process.

R&D professionals accomplish these performance objectives by exerting work effort during the week. Early in the Twentieth Century, the reduction of the workweek to the standard 40-hour week was a key labor market issue in the U.S., culminating with the enactment of the Fair Labor Standards Act of 1938 (Rones, Ilq, & Gardner, 1997). Although this act basically targeted non-exempt employees, the standard 40-hour week became traditional after the enactment of this act among R&D professionals working in many U.S. organizations. In today's business environment, however, such factors as globalization, downsizing, and demands for high productivity; professional and organizational cultures that value and reward working more than 40 h; and a desire for career success and a higher income pressure R&D professionals to work more than 40 h per week (Angerer, 2003; Fry & Cohen, 2009; Greenglass, Burke, & Moore, 2003; Hockey & Earle, 2006; Maslach, Schaufeli, & Leiter, 2001; Perlow, 1999; Rothmann & Joubert, 2007; Studt, 2004; Taurasi, 2008; Van Yperen & Janssen, 2002).

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Thus, R&D professionals may feel externally pressured to work more than 40 h per week. For example, managers may schedule meetings and training on weekends or late in the work-day; managers may ask them to deliver additional outputs to the outputs possible in the traditional 40 hour-week; managers may set tight project deadlines; managers may closely monitor time at the worksite; and managers may provide a role model by arriving early at the worksite, staying late, taking work home, working on week-ends, and staying connected 24/7 (Brett & Stroh, 2003; Perlow, 1998). Managers may also make R&D professionals aware that their jobs can be outsourced or moved to locations where wages are lower, and they can be replaced with temps or independent contractors willing to work beyond 40 h (Maume & Bellas, 2001; Rones et al., 1997; Sparks, Faragher, & Cooper, 2001). Moreover, R&D professionals may feel internally pressured to work beyond 40 h. These professionals may view work as central to their lives, may have a high need for career and financial success, may be afraid of failure at work, may be obsessed with work and may have what appears to be endless energy (Harpaz & Snir, 2003; Scott, Moore, & Micely, 1997; Shellenbarger, 2004; Sheridan, 1988; Spruell, 1987).

When R&D professionals work a number of hours per week, they work the majority of these hours at the technical task and the remaining of these hours at the administrative task (Badawy, 1982; Igbaria, Kassicich, & Silver, 1999; Jackson, 1998; Pelz & Andrews, 1976; Petroni, 2000; Younger & Sandholtz, 1997). For R&D professionals, the main task is the technical task. Examples of technical tasks are creating and developing new technologies, products and services; analyzing and solving technical problems; and providing technical support. For R&D professionals, the secondary task is the administrative task. Examples of administrative tasks are organizing the innovation process; leading and coaching other R&D professional and nonprofessional staff; and preparing and controlling plans, schedules and budgets (Cordero & Farris, 1992).

Thus, a relevant question is whether R&D professionals increase the extent they innovate and help manage the innovation process by working more than 40 h per week, and by working some of these hours at the technical task and the balance at the administrative task. In spite of the importance of this question for the effective time management of today's R&D professionals, the authors are not aware of any systematic study providing answers to this question. The purpose of this exploratory study is to search for answers to this question by proposing hypotheses about how weekly hours, and the partitioning of these hours into technical and administrative hours, relate to the extent R&D professionals innovate and help manage the innovation process. Moreover, by testing these hypotheses using a database the authors have obtained from 2308 R&D professionals working for 24 large organizations in the U.S.

2. Theoretical development and hypotheses

2.1. The effects of weekly hours

We use two complementary perspectives to hypothesize the effects of weekly hours on the extent R&D professionals innovate and help manage the innovation process. The first perspective proposes performance benefits to working hours. The second perspective proposes performance costs.

The performance benefits perspective proposes that the longer individuals work, the greater their effort. Moreover, this perspective proposes that the greater the work effort, the greater the job performance (Angerer, 2003; Bakker, Demerouiti, & Verbeke, 2004; Cordes & Dougherty, 1993; Greenglass et al., 2003; Hockey & Earle, 2006; King, de Chermont, West, Dawson, & Hebl, 2007; Lee, 1992).

The performance costs perspective proposes that working hours consume the physical and mental energy of individuals (Bakker et al., 2004). Thus, this perspective proposes that the longer individuals work, the greater their fatigue (Fletcher & Dawson, 2001; Hockey & Earle, 2006; Van Yperen & Janssen, 2002), and the greater their fatigue, the lower their job performance (Bakker et al., 2004; Bartley & Chute, 1947; Hockey & Earle, 2006; Schellenkens, Sijtsma, Vegter, & Meijman, 2000; Van der Linden, Frese, & Sonnentag, 2003; Webster, Richter, & Kruglanski, 1996; Welford, 1968). This reduction in job performance appears to be more pronounced when the task requires substantial information processing (Gardner, 1982; Gonzalez-Munos & Gutierrez-Martinez, 2007), as required by the technical and administrative tasks. When individuals work many hours per week, they deplete their physical and mental energy. When individuals experience this state of acute fatigue week after week, they feel stressed, exhausted and incapable of maintaining rapport with others (Cordes & Dougherty, 1993; Maslach et al., 2001). In other words, they experience burnout (Kalimo, Pahkin, Mutanen, & Toppinen-Tanner, 2003; Shirom, Nirel, & Vinokur, 2006; Taris, 2006; Toppinen-Tanner, Kalimo, & Mutanen, 2002). When individuals experience burnout, their decision-making becomes impaired (Leong, Chang, & Olomolaiye, 2008). Moreover, they lose the ability to pay attention to details (Ng & Feldman, 2008), to process information (Janssen, 2001), and to think creatively (Amabile, Hadley, & Kramer, 2002). Thus, they lose the ability to perform (Angerer, 2003; Taris, 2006; Wright & Bonett, 1997).

We now combine the two perspectives to propose that there are performance gains to working an additional hour when the performance benefits are greater than the performance costs. Moreover, there are performance losses when the performance costs are greater than the performance benefits. At 40 h per week, we expect performance gains with one additional hour. We expect, however, the performance costs (due to fatigue) to increase faster than the performance benefits (due to effort) with each additional hour. Thus, we expect diminishing performance gains with each additional hour up to the optimal hours (when the performance benefits equal the performance costs). Moreover, we expect maximum performance at the optimal hours, and increasing performance losses with each additional hour beyond the optimal hours. Thus, for individuals, *the profitable-hours (PH) range* is expected to start at 40 h and to end at the optimal hours. The PH range is defined as the hourly range within which individuals can increase their performance by working beyond 40 h per week.