
Lifestyle Balance: A Review of Concepts and Research

Charles H. Christiansen & Kathleen M. Matuska

Abstract

The perceived stress of time-pressures related to modern life in Western nations has heightened public interest in how lifestyles can be balanced. Conditions of apparent imbalance, such as workaholism, burnout, insomnia, obesity and circadian desynchronization, are ubiquitous and have been linked to adverse health consequences. Despite this, little research has been devoted to the study of healthy lifestyle patterns. This paper traces the concept of lifestyle balance from early history, continuing with the mental hygiene movement of the early twentieth century, and extending to the present. Relevant threads of theory and research pertaining to time use, psychological need satisfaction, role-balance, and the rhythm and timing of activities are summarized and critiqued. The paper identifies research opportunities for occupational scientists and occupational therapists, and proposes that future studies connect existing research across a common link—the identification of occupational patterns that reduce stress. The importance of such studies to guide health promotion, disease prevention and social policy decisions necessary for population health in the 21st century is emphasized.

Key Words

Activity patterns
Health promotion
Stress
Time-use
Role
Resiliency

Charles Christiansen, EdD, OTR, OT(C), FAOTA, is George T. Bryan Distinguished Professor and Dean, School of Allied Health Sciences, the University of Texas Medical Branch at Galveston, Galveston, Texas, USA. His research interests include understanding human occupations and lifestyle patterns and their relationship to subjective well-being, resilience, health and quality of life.

Kathleen Matuska, MPH, OTR/L, is Associate Professor and Graduate Program Director, Department of Occupational Science and Occupational Therapy, The College of St. Catherine, St. Paul, Minnesota, USA. Her research interests include lifestyle patterns and their relationship to well-being. She also studies lifestyle adaptations to chronic illness, particularly in persons with Multiple Sclerosis.

Address for correspondence:

cchristi@utmb.edu

The importance of a healthy, balanced lifestyle is widely advocated within developed nations, where it is commonly perceived that the demands of modern living often exceed people's ability to cope with them. Occupational scientists and therapists have been historically interested in this topic, knowing that the daily patterns of occupations chosen by individuals can either create a balanced or imbalanced lifestyle and influence one's state of health. Although the concept of a balanced lifestyle seems implicitly understood, no consensus definition, model or measure has emerged to guide theory development. Only a handful of studies within economics, psychology, sociology, family studies, leisure science, occupational science, and the health professions (particularly occupational therapy and public health) have been published on the topic. The assumptions we explore in this paper about lifestyle balance are that a life congruent with one's values, skills and interests, composed of daily health habits, and relatively low in chronic stress will relate to positive life outcomes such as life satisfaction and quality of life. Additionally, we identify known indicators of imbalance, since much can be learned about healthy lifestyles by examining activity patterns that seem clearly unhealthy, stressful, or incongruent.

We begin by tracing the origins of the concept of lifestyle balance, beginning with ancient philosophers and continuing with efforts in the United States of America, linking these concepts to modern research on adaptation to stress. Next, we review and critique the limited research that directly relates to lifestyle balance in the areas of time use, role theory, theories of psychological need, and chronobiology. Thirdly, we identify personal and environmental conditions that place people at risk for lifestyle imbalances and identify concepts from the literature that reflect such imbalances. Finally, we attempt to identify obvious conceptual bridges across existing research, arguing that additional understanding of healthy lifestyle patterns is essential if public health efforts toward disease prevention and health promotion are to be effective and social policy is to be well informed.

The literature selected for this review included papers published in scholarly journals over the past 25 years retrievable from the following electronic indexes: *Cumulative Index to Nursing and Allied Health Literature (CINAHL)*, *Index Medicus*, *PsychInfo*, *Social Science Citations Index (SSCI)*, and *Web of Science*. The literature searches were performed using the following keywords: Activity patterns, balance, health, lifestyle, life satisfaction, quality of life, resiliency, roles, time use, work/life balance and well-being.

Only papers consisting of reviews or reports of empirical research were included.

Evidence of a perceived lack of lifestyle balance is widespread within developed countries, as seen in increased reports of stressful lives. For example, in the United States of America during 1990 and 1993, over half of surveyed respondents reported experiencing "a lot" or "moderate" stress during the previous year (Bachmann, 2000; Robinson, & Godbey, 1997). Nearly half of U.S. workers report that their jobs interfere some or a lot with their personal lives, and nearly three quarters of working mothers and fathers feel they do not have enough time to spend with their children (Bond, Galinsky, & Swanberg, 1998). A study by the Conference Board of Canada found that the number of Canadians who reported moderate and high levels of stress as a result of perceived work-family imbalance increased from 26.7% in 1989 to 46.2% in 1999 (Bachmann). Given the growing need for successful adaptation to stressful lives in modern times, studying lifestyle balance is timely and useful for understanding important components in life considered necessary for reducing the consequences of chronic stress and for enhancing health and well-being. For this paper, we adopted a working definition of lifestyle balance as: "A consistent pattern of occupations that results in reduced stress and improved health and well-being." In the sections to follow, we use this definition to trace the history of the concept of lifestyle balance and to describe and compare approaches that have been taken by researchers interested in the same or closely related constructs.

Historical Beliefs about Beneficial Ways of Living

The idea that living a balanced lifestyle will lead to health and well-being has persisted for centuries. Aristotle described human flourishing in the context of life activities that were virtuous and balanced to the interests, goals, values and capabilities of the individual (Aristotle, 1908). Hippocrates, and later Galen, each maintained that emotions influenced physical health, and these ideas persisted well into the Middle Ages (Sternberg, 1997). Teachings from belief systems ranging from Chinese medicine to Native American healing hold that maintaining health requires a balance among thoughts, actions and feelings, and that the physical and social environments in which people live provide them with both opportunities and challenges for meeting needs and maintaining well-being (Alter, 1999).

In Western cultures, understanding of lifestyle balance is deeply rooted in the history of society such as the changes brought about by Protestant reformation, industrialization, and Victorian ideals (Pierce, 2003). These periods changed daily patterns of living through modern forms of paid work and adaptation was necessary, such as creating new emphasis on leisure, with resultant health problems associated with sedentary lives. Clearly then, a common theme across the ages has been that well-being and happiness can be promoted by patterns of occupation that reflect a satisfactory relationship with self, others and the environment.

Lifestyle Balance and the Mental Hygiene Movement

In the United States, many current ideas regarding lifestyle balance have their roots in the work of Adolf Meyer. Meyer was the celebrated chairman of the Department of Psychiatry at Johns Hopkins University and an influential proponent of the mental hygiene movement of the early twentieth century. The mental hygiene movement resulted from widespread concern with societal changes that created unsanitary living conditions and other stressful circumstances. This effort was tantamount to a public health initiative that encouraged fitness, nutrition, active engagement, personal growth and other healthful practices to protect mind and body from harmful consequences.

Meyer championed a view of mental health he called psychobiology. His theory held that lifestyle and biological factors interacted to explain mental illness (Dreyer, 1976). In Meyer's view, mental illness was seen as a maladaptive response to the problems of living, brought about by the rapid growth of industry and crowded living conditions in cities (Rossi, 1962). Meyer believed many health problems could be understood as disorders of activity, which he called 'ergasias' (Lief, 1948).

Meyer's clinical approach relied on understanding the lifestyle patterns of his patients as derived from a detailed activity history. His views were contrary to existing notions of the time that sought to link biological structures with mental illness (Dewsbury, 1991). Because he believed that healthy habits of lifestyle could help prevent mental illness, Meyer was a strong proponent of occupational therapy and the habit training interventions attributed to Eleanor Clarke Slagle. His association with this nascent field led to his invitation to address the first annual meeting of the Society for the Promotion of Occupation Therapy, in the United States. During that presentation, Meyer proposed a philosophy of occupation therapy, in which he observed:

The whole of human organization has its shape in a kind of rhythm. It is not enough that our hearts should beat in a kind of rhythm, always kept up to a standard at which it can meet as well as wholesome strain without upset. There are many other rhythms which we must be attuned to: the larger rhythms of night and day, of sleep and waking hours, of hunger and its gratification, and finally the big four—work and play and rest and sleep, which our organism must be able to balance even under difficulty. The only way to attain balance in all this is actual doing, actual practice, a program of wholesome living as the basis of wholesome feeling and thinking and fancy and interests. (Meyer, 1922, p. 6)

Meyer advocated for community-based programs to prevent the consequences of these threats to mental health. Adolf Meyer's ideas can be regarded as early precursors to modern

stress research in that they recognized the negative health consequences of stressful life circumstances and the importance of lifestyle patterns to both physical and mental health.

The Connection between Concepts of Lifestyle Balance and Modern Stress Research

Twenty years after Meyer's address to the occupational therapy society, the physiologist Walter Cannon (1939) published his theory of homeostasis, asserting that because environments are continuously changing, people must constantly find ways to adapt if they are to survive and flourish. Later, Hans Selye defined the demands of the environment as stressors and his theory of the General Adaptation Syndrome created interest in the types of life events that lead to distress, a bodily reaction to stressors that has a cumulative negative influence on health (Selye, 1946). Further research by Harold Wolff, drawing on the earlier work of Meyer, linked life events with the accumulation of stress (Wolff & Goodell, 1968; Wolff, Wolff & Hare, 1950).

In the past quarter century, perhaps because of the growing recognition that psychosocial factors play a major role in the most prevalent and costly health conditions of our time, there has been a renewed interest in lifestyle factors and their influence on health, particularly as these relate to the body's stress responses (Baum, Garofalo, & Yali, 1999; McEwen, 2001; Seeman, Singer, Ryff, Love & Levy-Storms, 2002). Three important areas of research have contributed to what we know about lifestyles and stress. These include: (a) the major sources of stress in everyday life, (b) the cumulative physiological affects of stress upon health, and (c) the human characteristics and lifestyle conditions that buffer or remediate stress, sometimes described as resiliency. This broad literature has conclusively established that the stress experienced during everyday life can have a cumulative impact on physical and mental health (Kemeny, 2003; Kiecolt-Glaser, McGuire, Robles & Glaser, 2002). Identifying lifestyle patterns that enable people to manage the demands of everyday life more successfully and therefore promote health, prevent illness, and improve perceived well-being by reducing stress was the central idea in Adolf Meyer's psychobiological perspective and is an implicit tenet underlying much of the research on behavior and health that has been conducted during the past century.

Comparing Lifestyle Balance and Quality of Life

Because of limited research, the concept of lifestyle balance lacks empirical support and an agreed upon definition. Consequently, one can rightly question how the construct differs from other and perhaps related notions of positive state, such as quality of life, subjective well-being and life satisfaction. Veenhoven's (2000) work on quality of life is useful here because it helps situate the concept of life balance within an overarching concept of quality of life that he proposed can be measured by any or all of the following:

subjective feelings about one's life, objective environmental conditions, personal skills and abilities, and life outcomes. Veenhoven's model distinguishes between people's perceptions of their lives and the objective patterns of occupations they exhibit over time. His model views happiness and life satisfaction as a single dimension of life quality derived from the subjective experiences and feelings of the individual. On the other hand, Veenhoven noted, people possess individual resources and characteristics that help them achieve their desired goals and which can be objectively measured. Assuming the elements of a balanced lifestyle can be identified, it is assumed that people can learn to live their daily lives in ways that reduce stress and foster health and well-being. Thus, Veenhoven's model would distinguish between people's perceptions of balance and the actual patterns of occupations they exhibit over time. In the sections that follow, we explore how patterns of occupations or lifestyle characteristics (components of a balanced life) relate to well-being.

Research on Lifestyle Characteristics and Well-being

Most recent research on lifestyle and health has focused on occupations, such as participation in exercise; sleep habits, or nutritional practices, as these relate to specific conditions such as hypertension, heart disease or diabetes. With a few exceptions (Denton, Prus & Walters, 2004; Halfon & Hochstein, 2002; McEwen & Stellar, 1993; Yarcheski, Mahan, Yarcheski, & Cannella, 2004), the scientific literature during the past decade has seldom included reports describing integrated perspectives of lifestyle and stress as these influence health and well-being. In this section, we review four approaches to studying the organization of life activities and how they contribute to well-being. Our review includes studies of time use, studies of social roles, studies of need satisfaction and well-being, and studies of lifestyle patterns as these are influenced by biological rhythms.

Lifestyle balance as time use

Perhaps the most familiar view of lifestyle balance involves the perceived time-stress associated with social pressures to fit more occupations within a timeframe that cannot be expanded. The competing time demands of work and family non-work roles have been referred to as a 'time bind' or 'time famine' (Hochschild, 1997; Perlow, 1999; Robinson, & Godbey, 1997). Scholars in the sociological, family-relations, vocational and organizational literature have framed the challenge of managing multiple roles and therefore reducing the perceived stress of daily life as one of achieving work/non-work, work/life, or work/family balance. Many studies have used time as the independent variable in measuring the relative balance of energy and attention toward work and non-work domains of life (Greenhaus, Collins & Shaw, 2002; Judge, Boudreau, & Bretz, 1994; Tenbrunsel, Brett, Mao, Stroh, Reilly, 1995). Some studies have treated balance in an indirect way, examining the relationship between total hours spent in work, and/or non-work activities and dependent variables such as role or work/family conflict, marital satisfaction, or

measures of quality of life, mental health or temporal adaptation (Camporese, Freguja, & Sabbadini, 1998; Crist, Davis & Coffin, 2000; Greenhaus & Beutell, 1985; Holman & Jacquart, 1988). In these studies, balance is often inferred through examining the amount of time reported as spent in one category as a proportion of the total time available during a week. Other studies have attempted to consider a computed ratio of time spent in work-related versus family-related pursuits as a measure of balance (Greenhaus, Collins & Shaw; Gutek, Searle & Klepa, 1991). A study by Marino-Schorn, (1986) went beyond work and non-work categories to consider time spent in rest and sleep, but failed to find an association between time allocated among three life domains (work, leisure, and rest) and morale.

Because of methodological weaknesses and conflicting findings, studies examining time allocation have not proven very useful for understanding the broad complexities of lifestyle patterns and well-being. Most time use studies have relied upon self-reported estimates of time spent in work and/or non-work activities without attempts to provide objective validation of reported time use estimates. For the majority of these studies, data have been collected through surveys or interviews rather than from time diaries, which are more comprehensive and accurate. This is problematic because errors of recall for time use estimates are well documented (Juster & Stafford, 1991; Robinson & Bostrom, 1994; Zuzanek, 1998a). There is also the problem of time perception and context (Fenstermaker, 1996). Estimating the hours allocated to various life domains does not provide information about the contextual or qualitative features of time use such as the perceived enjoyment or meaning of the time spent (Thompson & Bunderson, 2001). This is problematic not only because of known differences between how men and women organize and experience time (Hareven, 1977; Maines & Hardesty, 1987), but also because of differences in how personal (household) and public (workplace) time is structured and experienced (Flaherty, 1991; Primeau, 1996; Zerubavel, 1979). Thompson and Bunderson have questioned the wisdom of using the balance metaphor to describe the allocation of time across work and non-work categories, arguing that life domains should be construed as containers of meaning, thereby providing a richer analysis grounded in phenomenology. They argue that the quantitative allocation approach has limited the information available on time use to two categories or domains, (work and non-work), suggesting that lifestyles have broader and richer variation that should be considered. We agree, and suggest that such a coarse classification also does not permit the distinction between aspects of the work or non-work environment that contribute to relationships or identity building needed for a balanced life.

Nor does the work/non-work categorization specifically or directly address the extent to which time spent fulfills other salient human needs. Moreover, time-allocation studies typically do not provide useful information regarding consistent patterns or routines of behavior in a manner sufficient to begin to understand the complexities of lifestyles and how patterns (or rhythms) of everyday life contribute to

well-being. Other suggestions for improving studies of time use include supplementing diaries with event sampling procedures and/or interviews in order to gather more qualitative data on the meanings and feelings associated with different occupations (Erlandsson & Eklund, 2001; Erlandsson, Rognvaldsson, & Eklund, 2004; Klumb & Perraz, 2004; Reis & Gable, 2000). Time structure or commitment may be another facet of time use that can be examined when considering lifestyle balance. Researchers (Jonsson, Borell & Sadlo, 2000; Zuzanek, 1998b) have found that lower levels of mental health are associated with both high and low levels of time pressure (for example, activity requirements within a specified timeframe), suggesting that a moderate amount of structured time, such as having weekly or daily work or social commitments, may be beneficial to well-being. Jonsson, Josephsson and Kielhofner (2001) studied time use after retirement and found that in the subjects studied, temporal rhythm slowed, the meaning of some occupations changed, and individuals moved from the perceived imbalance of too much work to an imbalance of not enough committed time.

In summary, time use must be viewed as an important dimension of lifestyle balance, since knowledge of how people spend their time provides useful insights into the nature and frequency of their occupations. Discerning healthful patterns of time use first requires valid and reliable means for measuring and analyzing time use. Moreover, some means for determining the qualitative features of time use are also desirable. The objective is to identify distinct patterns of occupation that can be appropriately classified and associated with measures of health and well-being.

Balance as fulfillment of social roles

The examination of social roles (such as worker, spouse, parent, etc), and how role configurations, or different combinations of roles, result in varying demands for adaptation represents another approach to understanding lifestyle balance. The presumption underlying this research is that social roles represent a rich approach to portraying lifestyles because roles involve occupations that bring obligations and demands as well as pleasures and resources. Research has shown that there is an association between the number of a person's current roles and the number of occupations in which he or she would typically engage (Barnett, 1993). Role fulfilling occupations are means for enabling psychological needs to be met, thus engendering well-being. From a social roles perspective, lifestyle balance would be achieved if all valued roles were fulfilled satisfactorily. On the other hand, role stress occurs when there is an inability to meet the requirements of one's roles (role strain) due to too many roles or excessive demands within them (role burden), emotional spillover from one role to another, and role conflict, where time allocation or demands of one area of life (typically, work), creates a lack of fulfillment or satisfaction in non-work areas, such as family occupations. Consequently, it is not surprising that research has shown that participation in valued roles is related to life satisfaction and measures of well-being (Verbrugge, 1983). We summarize findings related to each of these concepts below, with

emphasis on how this research contributes to an understanding of lifestyle balance.

Role strain and role burden

Goode (1960) introduced a theory of role strain, defined as the difficulty in fulfilling role demands. He proposed that people typically experience role strain in their lives, and that they accommodate by choosing among several options, such as through the elimination of roles, delegation of responsibilities, or modification of the manner in which role obligations are met. Goode's theory emphasizes the need to view individuals (and communities) in terms of their overall configuration of role relationships, the complexity of which enables multiple options or potential conflicts for accommodating to the unexpected challenges of daily life.

Other previous research examining lifestyle has considered the issue of role burden as an approach to identifying activity-related factors that promote or impair health. Role burden is different from role strain in the added emphasis on subjective determinants. It is measured both in terms of the number of roles occupied by an individual, as well as the perceived quality of experience in role engagement (Tingey, Kiger & Riley, 1996; Verbrugge, 1983; Voydanoff & Donnelly, 1999). Because roles may have both beneficial as well as burdensome attributes, the expectation has been that people who are able to balance their role demands will experience greater benefit and less stress, leading to better mental and physical health.

Research on role burden and role strain has shown some interesting and unexpected findings. While detailed reviews are available elsewhere (Barnett, 1993; Green & Russo, 1993; Sears & Galambos, 1993), findings indicate that having more social roles typically has beneficial consequences, since it may enable the individual to have access to more social support. Moreover, more roles provides greater self-complexity, and reduces a person's vulnerability to stress, since if one role or aspect of the self is particularly stressful, others exist which may counterbalance these experiences and provide a buffer against spillover (Linville, 1987).

Understandably, individual characteristics (such as a sense of control) (Lu & Lin, 1998; Voydanoff & Donnelly, 1999) and qualitative factors including supportive family members, bosses and co-workers (O'Neil & Greenberger, 1994; Simon, 1995), commitments (O'Neil & Greenberger), or personal meaning (Marks & MacDermid, 1996) have been shown to reduce the stress associated with having multiple roles. Thus, examining perceptions of role strain or role burden and social contexts may be one way of exploring balanced lives but does not suffice alone.

Research on roles and time use has provided insight into factors that contribute to or alleviate the consequences of life stress yet, studies have generally failed to provide information about the patterns or types of specific activities and practices that typify the roles of the most (or least) successful study participants. Studies of roles, per se, are insufficient to contribute to a useful understanding of the specific factors

underlying balanced lifestyles unless the occupations comprising them are described in greater detail and the relationship to individual needs and characteristics is more explicit.

Role balance

The ability to successfully adapt to the demands of multiple roles comes closest to resembling the central issues of concern in this paper. Marks and MacDermid (1996) argued for the development of a non-hierarchical and holistic approach to understanding role balance, and proposed that positive role balance was reflected in a person's "tendency to become fully engaged in the performance of every role in one's total role system, to approach every typical role and role partner with an attitude of attentiveness and care" (p. 421). In testing their model across two separate samples, they found that role balance correlated with self-esteem, affect, mastery and innovativeness.

Another study by Marks and colleagues (Marks, Huston, Johnson & MacDermid, 2001) used more detailed data about lifestyles and time use with the aim of identifying underlying factors that predicted role balance in married couples. Substantial gender differences were found in predictors of role balance, with financial circumstances, the timing and types of occupations, availability of time for leisure (and its context), social network involvement, and marriage relationship maintenance contributing to perceived balance in distinct ways for the husbands and wives. This study provided useful detail about time use and occupations within role configurations, and linked occupations to needs. It suggested that subjects' levels of satisfaction were related to the perceived adequacy of time spent in occupations and the extent to which occupations undertaken in role performance met instrumental household needs, as well as individual needs for leisure and social interaction. The study underscored the importance of viewing role performance as a complex system involving specific occupations, individual characteristics, environmental resources and time allocation.

Work/non-work and work/family balance

One variation of role balance, termed work-family balance, refers to the notion of equality of experiences (either positive or negative) in satisfaction, functioning and effectiveness across work and family roles (Kofodimos, 1990). Businesses have become more concerned about this concept because research suggests that work imbalance creates high levels of stress, and reduces work effectiveness (Thompson & Bunderson, 2001). The work-family literature shows that more work hours or unusual work schedules often lead to conflict, and that career achievement is related to time away from family (Greenhaus et al., 2002). Thompson and Bunderson found in a study of professionals employed in public accounting that work-family balance is associated with quality of life when there is substantial time, involvement and satisfaction distributed across roles. For participants experiencing imbalance across roles (greater time, involvement or satisfaction in one role than another) those who spent more time on family roles experienced higher

quality of life than those who spend more time on work roles.

Smedley and Syme (2000), however, caution against examining work-family balance from only a perspective of time allocation among various roles, suggesting instead that work and non-work conflict is also shaped by the meaning derived from time use in those roles. They assert that additional research is needed to understand the subjective experiences of work and non-work and the perceptions of conflict as it relates to identity and values.

Studies of work and family roles have provided useful information about how competing demands on time and energy can become sources of conflict and stress. However, they are not ideally suited for conceptualizing lifestyle patterns in a more comprehensive framework that considers other non-work domains. By focusing mainly on work and family, these studies fail to delineate the effects of specific types of occupation as they may be matched to individual skills, values and interests. Nor do they provide insight into the possibility that role diversity may enable an individual who is unhappy at work to address (or compensate for) unmet needs through rewarding non-work occupations, such as leisure or volunteer work. Such need fulfillment approaches to understanding lifestyle satisfaction constitute a line of research being pursued in motivational, personality and social psychology. We turn now to a brief review of this need-based research.

Balance construed as lifestyles that meet psychological needs

Engaging in occupational patterns that enable individuals to meet psychological needs constitutes a third distinct approach for conceptualizing lifestyle balance. Psychological needs can be viewed both as intrinsic motivating forces as well as unconscious requirements that are necessary for an individual's growth and integrity (Ryan, 1995). They can also be viewed as the qualities of experiences that make them satisfying or unsatisfying to an individual (Sheldon, Elliot & Kim, 2001).

Lifestyles that meet an individual's needs can be viewed as balanced in the sense that by doing so, they contribute to a person's health, development and well-being. An understanding of needs as sources of motivation and fulfillment helps explain why people choose specific roles and occupations in their lives, and why they may flourish or flounder in these roles. Roles and occupations, as the previous section illustrated, influence lifestyle patterns, and therefore constitute another approach toward gaining an understanding of how lifestyle balance can be usefully defined.

But which specific fundamental psychological needs must be met in order for a lifestyle to be considered balanced? Addressing this question would require that some list of fundamental psychological needs be identified, contending that lifestyles with occupational patterns or qualities of experience that meet these needs would contribute to satisfaction and well-being. Unfortunately, although theorists have proposed many psychological needs in the years since

William McDougall first introduced the concept (McDougall, 1908), consensus has not yet been achieved regarding a fundamental list of human needs necessary for well-being (Sheldon, et. al, 2001). Models of psychological need fulfillment proposed by Maslow (1943, 1968), and Deci and Ryan (2000), provide useful beginnings because of their broad recognition and the empirical support for the needs or qualities of experience they identify as universal (setting aside for the moment Maslow's controversial ideas of need strength or hierarchy). We also consider the needs implied by the resilience theory proposed by Ryff and colleagues (Ryff, 1995; Ryff & Keyes, 1995; Ryff & Singer, 1996). Although not presented explicitly as needs, the characteristics or psychological dimensions described by Ryff and colleagues imply conditions that, when met, may serve to buffer against the effects of stress and lead to psychological well-being. These dimensions will be explained below.

A review of the needs identified by these theorists as necessary for well-being highlights some important similarities and differences. Maslow's theory suggests that a balanced life would be one where biological, safety, self-esteem, affiliation (social) and self-actualization needs are met (Haymes & Green, 1982). Maslow distinguished between what he termed deficiency needs and those he termed being needs, with the former representing physiological and safety conditions necessary for existence and the latter (including affiliation and self-actualization), relating to personal growth, selfhood and integration (Maslow, 1970). Although Maslow's theory has been criticized, primarily based on his assertions about the relative potency of needs (Wahba & Bridwell, 1976; Wanous & Zwany, 1977), a growing recent literature is finding support for the needs Maslow proposed and for the distinction he made between deficiency needs and being needs as elaborated in his later writings (Cameron, Banko & Pierce, 2001; Hagerty, 1999; Wicker, Brown, Wiehe, Hagen & Reed, 1993; Wicker & Wiehe, 1999; Wicker, Wiehe, Hagen & Brown, 1994).

Other theorists have also proposed essential psychological needs and have achieved significant agreement on certain requirements for human thriving. At issue seems to be the number of basic psychological needs and how they are defined and demonstrated (or measured). The literature suggests that the overall direction is one of convergence toward several (3-7) central human needs. For example, to support a theory of psychological well-being across the lifespan, Ryff and Keyes (1995) identify self-acceptance, positive relations with others, autonomy, personal growth, mastery, and purpose in life as necessary for human flourishing. Empirical evidence is available to support the fulfillment of these needs as a buffer against the deleterious effects of everyday stress, as measured by objective physiological markers comprising allostatic load and implicated in chronic diseases (Brim, Ryff & Kessler, 2004; Seeman et al., 2002). Although there are minor differences in how these psychological dimensions are defined, the list provided by Ryff and Keyes overlaps substantially with the needs identified by Maslow. Maslow's concept of self-actualization seems to include aspects of autonomy, personal growth, mastery and purpose in life. His

affiliation and self-esteem needs clearly overlap with the self-acceptance and positive relations with others dimensions identified by Ryff and Keyes (1995).

In contrast, Deci and Ryan, (2000) originators of Self-Determination Theory, argued cogently that only three primary needs (autonomy, competence and relatedness) constitute essential requirements for well-being. They support their contention by asserting (a) that these three needs can readily accommodate others from competing theories that have similar themes; (b) that other proposed needs are not essential for human thriving, and (c) that other suggested needs represent desires or values, as opposed to psychological needs essential or necessary for thriving or personal integration. Even without their assertion that autonomy, competence and relatedness constitute the ultimate list of essential human needs, one can readily appreciate the concordance among the needs identified by the different theorists reviewed above.

In an attempt to determine which needs are truly the most fundamental, Sheldon, Elliott and Kim (2001) compiled ten widely recognized psychological needs, drawing from a range of theories (including those described above) and tested them in a series of three studies using various time frames and two distinct ways of life, using subjects from South Korea (collectivist culture) and the United States of America (individualistic culture). They concluded that the cluster of autonomy, relatedness, competence, and self-esteem were universally most related to well-being (thus supporting Deci and Ryan's contention). They also found security to be an important need, particularly in times of deprivation, lending some support to Maslow's model of deficiency and being needs. Other studies have found support for some or all of the four universal needs identified by Sheldon (Branholm & Fuglmeier, 1992; Chirkov, Kim, Ryan & Kaplan 2003; Gillard & Segal, 2002; Reitzes & Mutran, 2002).

Sheldon and colleagues acknowledge that the subjects used for their study of core needs involved only young adults. We speculate that if their study had used a more representative sample that included age groups across the life span, other core needs might have emerged with more importance, particularly those concerning physical and bodily health and meaning. We argue for the importance of physical health and vitality as a core need, since poor health and limited functional ability can interfere with participation in valued occupations (Christiansen & Matuska, 2004). Certain health-related behaviors such as exercise, eating nutritious meals, following medication protocols, and getting adequate rest are known to have mental and physical health benefits (Glass, de Leon, Marottoli & Berkman, 1999). Widespread participation in such occupations certainly suggests that, at the least, some people are motivated to engage in occupations that have health promoting characteristics.

Several theorists contend that a need related to self-actualization, meaning and purpose in life is important, particularly for individuals in middle and later life stages (Antonovsky, 1987; Baumeister & Wilson, 1996; Ryff &

Singer, 1998). Antonovsky's salutogenic theory identifies meaning as a key component of adaptation to stress, and other researchers have found support for the relationship between life satisfaction and participation in meaningful occupations (Christiansen, 1999; Everard, 1999; Persson, Eklund & Isacson, 1999).

Our review suggests that important needs for helping to define balanced lifestyles include (1) autonomy/independence, (2) relatedness/affiliation (3) competence/mastery/effectance, (4) self-esteem, (5) security/safety, (6) self-actualization/meaning/purpose in life, and (7) physical health/function/vitality. No hierarchy is intended by the ordering of these need categories, although it is acknowledged that some method for determining an order might be useful for understanding how need-fulfillment in some areas might provide a more important contribution to well-being than others. The assertion here is that greater lifestyle balance is achieved by participating in roles and occupations that meet these seven important psychological need categories. This assertion is supported by a substantial and growing body of research by Ryff and colleagues (Brim et al., 2004) and in research supporting Deci and Ryan's (2000) Self-Determination Theory.

Chronobiology and lifestyle balance

A fourth approach to be reviewed concerning lifestyle balance involves chronobiology and the biological timing and rhythm of daily occupation as influenced by circadian (24 hour) rhythms. Adolf Meyer's remarks to the occupation therapy society in 1922 (quoted earlier) clearly convey the notion of timing and rhythm as an important influence on occupational patterns and a key element of his view of balance. At the time of his remarks, chronobiology, the study of the body's physiological clocks, was just gaining momentum, aided by the work of one of Meyer's colleagues, Curtis Richter, at Johns Hopkins University (Rechtschaffen, 1998; Richter, 1967). Circadian rhythms, which influence a myriad of behavioral and physiological events, are driven by a pacemaker structure known as the superchiasmatic nucleus, or SCN, and peripheral oscillators. Among other functions, the timekeeping process of the SCN influences when a person is at physiological advantage for the demands of occupation and, conversely, when he or she is in a natural period of rest or sleep.

When patterns of occupation are synchronized with SCN through daily habits and routines, people sleep better and, not unexpectedly, function optimally and feel best. A voluminous literature has documented conclusively that memory, cognition, learning, mood, alertness, and other attributes important to the performance of everyday occupations are influenced by inner clocks and by the entrainment of daily behavior to these biological mechanisms (Carrier & Monk, 1999).

Chronobiologists have learned that certain events or occupations, termed zeitgebers, help to entrain or synchronize the body's circadian rhythms to the external world. Social 'zeitgebers' include such activities as regular interpersonal contacts, social duties, routine chores such as walking the dog,

the timing of meals, and when a person goes to bed. The 'social zeitgeber theory' (Ehlers, Frank & Kupfer, 1988) posits a causal relationship between the stability of social rhythms and the stability of circadian rhythms. Interpersonal engagement also seems to be an important social zeitgeber. Consistent and predictable (balanced) social contact seems to stabilize mood and circadian rhythms (Ashman, Monk & Kupfer, 1999).

To measure the stability of zeitgeber activity, an interesting variation of the time diary, the Social Rhythm Metric (Monk, Frank, Potts, & Kupfer, 2002; Monk, Kupfer, Frank & Ritenour, 1991) has been used to discern the regularity of engagement in specified daily occupations. In this diary, the subject records the time of day he or she engages in 17 items that are thought to be biological and/or social zeitgebers. Based on empirical research with the Social Rhythm Metric, greater temporal regularity has been associated with sleep quality, mental health and overall well-being (Monk, Petrie, Hayes & Kupfer, 1994; Monk, Reynolds, Buysse, DeGrazia & Kupfer, 2003; Shear et al., 1994). Lifestyle regularity appears to be related to age, with regularity increasing over the life span, possibly in response to both biological and psychosocial changes. Scientists speculate that this finding may represent an adaptation to age-related changes in the circadian system's sensitivity to entraining agents (Monk, Reynolds et al., 1997). Research has also shown that life events, such as the birth of a baby, can disrupt ordinary rhythms and have a deleterious effect on lifestyle and relationships (Monk, Essex et al., 1996).

Interestingly, social zeitgeber theory has spawned an intervention approach to counteract the consequences of desynchronization by encouraging a regimen of lifestyle regularity and balanced social interaction to help manage both unipolar and bipolar depression and anxiety (Frank et al., 1997; Rosenwasser & Wirz-Justice, 1997; Shear et al., 1994). This approach is strikingly reminiscent of the habit training programs for persons with mental illness used as an intervention during the era of Adolf Meyer's psychobiological theory (Slagle, 1922).

In summary, it is well established that occupational engagement (and thus lifestyle) is influenced by circadian rhythms, and that these rhythms are reciprocally entrained by social activities, known as zeitgebers. Less regularity in a person's lifestyle influences this system and may lead to diminished health and well-being through desynchronization, which can influence emotions and mood, and diminish sleep quality and immune function. Biological rhythms and their well-established connection to human occupation through the entrainment process offer an important biological perspective on the concept of lifestyle balance.

Conditions of Lifestyle Imbalance

No review of the concept of lifestyle balance would be complete without consideration of the conditions that indicate imbalance. Although lifestyle balance is a difficult construct to define, lifestyle imbalance seems easier to identify. Within the

general population, lifestyle imbalance is often experienced as a difficulty in meeting the demands of modern life because of perceived or actual time constraints. These constraints limit peoples' ability to meet important personal or social needs in a satisfactory or meaningful manner, and lead to adaptive behaviors and stress. Examples of adaptive responses to time pressure include working vacations, modern multi-tasking strategies, and time management seminars. Time-coping strategies are facilitated by modern inventions such as laptop computers, cellular phones, and personal digital assistants (PDAs).

Lifestyle imbalance may be experienced as anxiety, as fatigue or drowsiness resulting from insufficient sleep, or as the nagging perception that one has too little rest or leisure time, or insufficient time for meaningful socialization with family and friends. This last condition has given rise to the Western expression "quality time", intended to mean time use that results in a satisfying, meaningful experience or higher quality of life. Thus, an imbalanced lifestyle can be described as one where important needs are not being met, where there are either too many or too few role demands, where time is inadequately used for meeting daily occupational demands, and where daily occupations are not meaningful, productive, restorative, and pleasurable.

An extreme form of imbalance can be imposed by the environment or outside forces. Wilcock (1998) uses the term "occupational deprivation" to describe the imbalance that results when people are unable to participate in meaningful occupations for prolonged periods of time because of factors beyond their control. Occupational deprivation can result from social and geographic isolation, economic constraints, cultural differences, and sociopolitical conditions resulting in repression or conflict (Whiteford, 2004). Unemployment, retirement, disability, incarceration, forced dislocation (including homelessness and refugeeism) and life in remote regions such as the Antarctic are examples of conditions of deprivation that place an individual at higher risk for lifestyle imbalance (Whiteford).

In another examination of concepts related to lifestyle balance, Westthorp (2003) observed usefully that imbalance can be attributed as much to conditions in the larger community or society as it can to individual habits, routines and skills. When people are unable to participate in a variety of meaningful occupations because of external constraints or conditions, their ability to lead balanced, healthy lifestyles is compromised.

Additionally, there are certain personal conditions that reflect atypical occupational patterns and should be considered *de facto* indicators of lifestyle imbalance. These include workaholism (McMillan & O'Driscoll, 2000), presenteeism (Dew, Keefe & Small 2005), burnout (Lashley, 2003; Maslach, Schaufeli & Leiter, 2000), insomnia and sleep disorders (Dew et al., 2003), obesity (McTigue et al., 2003) and circadian desynchronization or jet lag syndrome (Waterhouse, 1999). The literature on each of these conditions is extensive and studies in each area have shown strong evidence that links them to

stress and health consequences.

Another atypical personal condition was described by Vingerhoets, Van Huijgevoort and Van Heck (2002), called "leisure sickness". They hypothesize that this syndrome reflects an immune system response to the altered pace and diminished intensity of unstructured leisure and rest activities following changes in long established work routines. The transition to retirement is seen as a life event that places some individuals at risk for this condition. If substantiated, this syndrome will also reflect a condition of lifestyle imbalance.

Conclusion and a Call for Research

Four approaches to understanding lifestyle balance have been reviewed in this paper. These have included studies of time use, life roles, need satisfaction, and biological rhythms and their influence on behavior. Each of these views of balance involves human occupation examined from different perspectives, and each approach has linked health and well-being to certain lifestyle patterns.

Despite the obvious opportunities for combining and synthesizing these four lines of inquiry, studies across disciplines that combine these approaches have rarely been attempted. Yet, it is conceivable that studies of need fulfillment can be designed around role performance and time use to carefully document the association between lifestyle patterns and specific occupations and routines that lead to positive outcomes in health or perceptions of well-being. Similarly, measures of time use and circadian entrainment would be informative, yet were larger than the scope of our review.

We believe a theme with the potential to conceptually bridge the various areas of lifestyle research reviewed in this paper is one of determining how lifestyle patterns promote satisfactory adaptation to the stresses of everyday life; whether through time use, role balance, need fulfillment or circadian regularity. A cogent argument for the importance of lifestyle research can be found in the Global Burden of Disease Study (Jobst, Shostak & Whitehouse, 1999; Murray & Lopez, 1996), which projects that the majority of the conditions that will consume worldwide health resources in the year 2020 can be directly or indirectly related to lifestyle. Some of these conditions, such as cardiovascular disease, chronic obstructive pulmonary disease, and motor vehicle crashes are directly related to unhealthy or unsafe lifestyle habits. Others, such as unipolar major depression, substance abuse, and self-inflicted injury (suicide), can be traced to life circumstances that are not perceived by the individuals affected to be enjoyable, meaningful, or worthy of engagement. These have been aptly termed 'diseases of meaning' (Christiansen, 1999; Jobst, et al., 1999). The alarming incidence of meaning-related conditions creates a compelling need for a reappraisal of the personal and environmental factors that create conditions which exceed the coping resources of individuals and make life unbearable. The increase of such stress-related conditions calls for policies and health care strategies, such as those expressed in the Ottawa Charter (World Health Organization, 1986) that promote health through

lifestyle change. These strategies support the idea of promoting healthy balanced lives, yet clearly link the responsibility of societies and communities to support individuals in the formidable tasks associated with lifestyle changes.

Unfortunately, comprehensive theories of lifestyle (Fidler, 1995; Siegrist, 2000; Velde & Fidler, 2002) have not been influential in the design of public health initiatives to promote health or prevent disease or injury. Efforts at prevention often consist of targeting specific behaviors in order to reduce injury, disease and disability, for example, efforts to reduce the incidence of heart disease through diet and exercise (World Health Organization, 1986). Thus, emphasis is placed on preventing specific problems, rather than on promoting an overall pattern of living that leads to physical, emotional, social and spiritual well-being. Yet, according to Townsend and Wilcock (2004), opportunities for people to live life fully and enable participation in meaningful health-promoting occupations is a matter of survival, and therefore a basic right or a matter of justice. Whether or not one embraces that philosophy, the failure to advance theory related to understanding lifestyle and health will likely result in substantial social and economic cost for generations to come. Occupational science and occupational therapy are in a unique position to leverage their close relationship and understanding of human occupation and health to advance efforts in health, social policy and intervention. These two enterprises can also forge alliances with scientists and practitioners in other areas to encourage partnerships in translational research, perhaps advancing an understanding of the characteristics of balanced lifestyles that can lead to a reduction in stress-related disease. It is our hope that this review will encourage additional efforts toward developing useful theory and practice in the service of helping people live more balanced, and therefore, healthier lifestyles.

Acknowledgments

We thank Carolyn Baum, Betty Hasselkus, Dennis Persson, and Elizabeth Townsend for thoughtful comments on earlier drafts of this paper.

References

- Alter, J. (1999). Heaps of health, metaphysical fitness: Aurveda and the ontology of good health in medical anthropology. *Current Anthropology*, 40 (Supplement; Special Issue: Culture; A Second Chance), S43-S66.
- Antonovsky, A. (1987). The salutogenic perspective: Toward a new view of health and illness. *Advances, The Journal of Mind-Body Health*, 4, 47-55.
- Aristotle. (1908). *The nicomachean ethics* (W. D. Ross, Trans.). London: Clarendon Press.
- Ashman, S., Monk, T., & Kupfer, D. (1999). Relationship between social rhythms and mood in patients with rapid cycling bipolar disorder. *Psychiatry Research*, 86, 1-8.
- Bachmann, K. D. (2000). *Work-life balance: Measuring what matters*. Ottawa: Conference Board of Canada.

- Barnett, R. C. (1993). Multiple roles, gender, and psychological distress. In L. Golderger & S. Breznitz (Eds.), *Handbook of stress: Theoretical and clinical aspects* (2nd ed., pp. 427-445). New York: The Free Press.
- Baum, A., Garofalo, J., & Yali, A. (1999). Socioeconomic status and chronic stress. Does stress account for SES effects on health? *Annals of the New York Academy of Sciences*, 896, 131-144.
- Baumeister, R. F., & Wilson, B. (1996). Life stories and the four needs for meaning. *Psychological Inquiry*, 7, 322-325.
- Bond, J., Galinsky, E., & Swanberg, J. (1998). *The national study of the changing workforce*. New York, NY: Families and Work Institute.
- Branholm, I., & Fuglmeier, A. (1992). Occupational role preferences and life satisfaction. *Occupational Therapy Journal of Research*, 12(3), 159-171.
- Brim, O., Ryff, C., & Kessler, R. (Eds.). (2004). *How healthy are we: A national study of well-being at midlife*. Chicago: University of Chicago Press.
- Cameron, J., Banko, K., & Pierce, W. (2001). Pervasive negative effects of rewards on intrinsic motivation: The myth continues. *Behavior Analyst*, 24(1), 1-44.
- Camporese, R., Freguja, C., & Sabbadini, L. L. (1998). Time use by gender and quality of life. *Social Indicators Research*, 44, 119-144.
- Cannon, W. B. (1939). *The wisdom of the body*. New York: Norton.
- Carrier, J., & Monk, T. (1999). Effects of sleep and circadian rhythms on performance. In F. Turek & P. Zee (Eds.), *Regulation of sleep and circadian rhythms* (pp. 527-556). New York: Marcel Dekker.
- Chirkov, V., Kim, Y., Ryan, R., & Kaplan, U. (2003). Differentiating autonomy from individualism and independence: A self-determination theory perspective on internalization of cultural orientations and well-being. *Journal of Personality and Social Psychology*, 84(1), 97-110.
- Christiansen, C. (1999). Defining lives: Occupation as identity: An essay on competence, coherence, and the creation of meaning - the 1999 Eleanor Clarke Slagle lecture. *American Journal of Occupational Therapy*, 53(6), 547-558.
- Christiansen, C., Backman, C., Little, B., & Nguyen, A. (1999). Occupations and well-being: A study of personal projects. *American Journal of Occupational Therapy*, 53(1), 91-100.
- Christiansen, C., & Matuska, K. (2004). The importance of everyday activities. In C. Christiansen & K. Matuska (Eds.), *Ways of living: Adaptation for special needs* (pp. 1-17). Bethesda, MD: AOTA Press.
- Crist, P., Davis, C., & Coffin, P. (2000). The effects of employment and mental health status on the balance of work, play/leisure, self-care and rest. *Occupational Therapy in Mental Health*, 15(1), 27-42.
- Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits. Human needs and the self determination of behavior. *Psychological Inquiry*, 11, 227-268.
- Denton, M., Prus, S., & Walters, V. (2004). Gender differences in health: A Canadian study of the psychosocial, structural and behavioral determinants of health. *Social Science & Medicine*, 58(12), 2585-2600.
- Dew, K., Hoch, C. C., Keefe, V., & Small, K. (2005). Choosing to work when sick: Workplace presenteeism. *Social Science & Medicine*, 60(10), 2273-2282.
- Dew, M. A., Hoch, C. C., Buysse, D. J., Monk, T. H., Begley, A. E., Houck, P. R., et al. (2003). Healthy older adults' sleep predicts all cause mortality at 4-19 years of follow up. *Psychosomatic Medicine*, 65, 63-73.
- Dewsbury, D. A. (1991). Psychobiology. *American Psychologist*, 46(3), 198-205.
- Dreyer, B. A. (1976). Adolf Meyer and mental hygiene: An ideal for public health. *American Journal of Public Health*, 66(10), 998-1003.
- Ehlers, C., Frank, E., & Kupfer, D. (1988). Social zeitgebers and biological rhythms. *Archives of General Psychiatry*, 45, 948-952.
- Erlandsson, L. K., & Eklund, M. (2001). Describing patterns of daily occupations: A methodological study comparing data from four different methods. *Scandinavian Journal of Occupational Therapy*, 8, 31-39.
- Erlandsson, L. K., Rognvaldsson, T., & Eklund, M. (2004). Recognition of similarities (ROS): A methodological approach to analysing and characterising patterns of daily occupations. *Journal of Occupational Science*, 11, 3-13.
- Everard, K. (1999). The relationship between reasons for activity and older adult well being. *The Journal of Applied Gerontology*, 18(3), 325-340.
- Fenstermaker, S. (1996). The dynamics of time use: Context and meaning. *Journal of Family and Economic Issues*, 17, 231-243.
- Fidler, G. S. (1995). Life-style performance: From profile to conceptual model. *American Journal of Occupational Therapy*, 50(2), 139-147.
- Flaherty, M. (1991). The perception of time and situated engrossment. *Social Psychology Quarterly*, 54(1), 76-85.
- Frank, E., Hlatala, S., Ritenour, A., Houck, P., Tu, X., Monk, T., et al. (1997). Inducing lifestyle regularity in recovering bipolar disorder patients: Results from the maintenance therapies in bipolar disorder protocol. *Biological Psychiatry*, 41(12), 1165-1173.
- Gillard, M., & Segal, M. (2002). Social roles and subjective well-being in a population of nondisabled older people. *Occupational Therapy Journal of Research*, 22, 96.

- Glass, T. A., de Leon, C. M., Marottoli, R. A., & Berkman, L. F. (1999). Population based study of social and productive activities as predictors of survival among elderly Americans. *British Medical Journal*, *319*, 478-483.
- Goode, W. J. (1960). A theory of role strain. *American Sociological Review*, *25*(4), 483-496.
- Green, B. L., & Russo, N. F. (1993). Work and family roles: Selected issues. In F. L. Denmark & M. A. Paludi (Eds.), *Psychology of women: A handbook of issues and theories*. Westport, CT: Greenwood Press.
- Greenhaus, J., & Beutell, N. (1985). Sources of conflict between work and family roles. *Academy of Management Review*, *10*(1), 76-88.
- Greenhaus, J., Collins, K., & Shaw, J. (2002). The relation between work-family balance and quality of life. *Journal of Vocational Behavior*, *63*, 510-531.
- Gutek, B., Searle, S., & Klepa, L. (1991). Rational versus gender role explanations for work/family conflict. *Journal of Applied Psychology*, *76*(4), 560-568.
- Hagerty, M. (1999). Testing Maslow's hierarchy of needs: National quality of life across time. *Social Indicators Research*, *46*(3), 249-271.
- Halfon, N., & Hochstein, M. (2002). Life course health development: An integrated framework for developing health, policy and research. *Milbank Memorial Fund Quarterly*, *80*(3), 433-479.
- Hareven, T. (1977). Family time and historical time. *Daedalus*, *106*, 57-70.
- Haymes, M., & Green, L. (1982). An assessment of motivation within Maslow's framework. *Journal of Research in Personality*, *16*(2), 179-192.
- Hochschild, A. R. (1997). *The time bind: When work becomes home and home become work*. New York: Metropolitan.
- Holman, T., & Jacquart, M. (1988). Leisure activity patterns and marital satisfaction. *Journal of Marriage*, *50*(1), 69-77.
- Jobst, K., Shostak, A., & Whitehouse, P. (1999). Diseases of meaning, manifestations of health, and metaphor. *Journal of Alternative and Complementary Medicine*, *5*(6), 495-502.
- Jonsson, H., Borell, L., & Sadlo, G. (2000). Retirement: An occupational transition with consequences for temporality, balance and meaning of occupations. *Journal of Occupational Science*, *7*, 29-37.
- Jonsson, H., Josephsson, S., & Kielhofner, G. (2001). Narratives and experience in an occupational transition: A longitudinal study. *American Journal of Occupational Therapy*, *55*, 424-432.
- Judge, T., Boudreau, J. W., & Bretz, R., Jr. (1994). Job and life attitudes of male executives. *Journal of Applied Psychology*, *79*, 767-782.
- Juster, F., & Stafford, F. P. (1991). The allocation of time: Empirical findings, behavioral models and problems of measurement. *Journal of Economic Literature*, *29*(2), 471-522.
- Kemeny, M. E. (2003). The psychobiology of stress. *Current Directions in Psychological Science*, *12*(4), 124-129.
- Kiecolt-Glaser, J., McGuire, L., Robles, T., & Glaser, R. (2002). Emotions, morbidity, and mortality: New perspectives from psychoneuroimmunology. *Annual Review of Psychology*, *53*, 83-107.
- Klumb, P., & Perraz, M. (2004). Why time sampling studies can enrich work-leisure research. *Social Indicators Research*, *67*(1-2), 1-20.
- Kofodimos, J. R. (1990). Why executives lose their balance. *Organizational Dynamics*, *19*(1), 58-73.
- Lashley, F. (2003). A review of sleep in selected immune and autoimmune disorders. *Holistic Nursing Practice*, *17*(2), 65-80.
- Lief, A. (Ed.). (1948). *The commonsense psychiatry of Dr. Adolf Meyer*. New York: McGraw Hill.
- Linville, P. (1987). Self-complexity as a cognitive buffer against stress-related illness and depression. *Journal of Personality and Social Psychology*, *52*(4), 663-676.
- Lu, L., & Lin, Y. Y. (1998). Family roles and happiness in adulthood. *Personality and Individual Differences*, *25*, 195-207.
- Maines, D., & Hardesty, M. (1987). Temporality and gender: Young adults' career and family plans. *Social Forces*, *66*(1), 102-120.
- Marino-Schorn, J. A. (1986). Morale, work and leisure in retirement. *Physical and Occupational Therapy in Geriatrics*, *4*(2), 49-59.
- Marks, S., Huston, T., Johnson, E., & MacDermid, S. (2001). Role balance among white married couples. *Journal of Marriage & the Family*, *63*(4), 1083-1098.
- Marks, S. R., & MacDermid, S. M. (1996). Multiple roles and the self: A theory of role balance. *Journal of Marriage & the Family*, *58*(2), 417-432.
- Maslach, C., Schaufeli, W., & Leiter, M. (2000). Job burnout. *Annual Review of Psychology*, *52*, 397-422.
- Maslow, A. H. (1943). A theory of human motivation. *Psychological Review*, *50*, 370-396.
- Maslow, A. H. (1968). *Toward a psychology of being*. New York: Wiley.
- Maslow, A. H. (1970). *Motivation and personality*. New York: Harper & Row.
- McDougall, W. (1908). *Introduction to social psychology*. London: Methuen.
- McEwen, B. (2001). From molecules to mind - stress, individual differences, and the social environment. *Annals of the New York Academy of Sciences*, *935*, 42-29.
- McEwen, B., & Stellar, E. (1993). Stress and the individual - mechanisms leading to disease. *Archives of Internal Medicine*, *153*(18), 2093-2101.

- McMillan, L. H. W., & O'Driscoll, M. P. (2000). *Identifying workaholism in the workplace: Practical definitions and validated measures*. Paper presented at the British Psychological Society Occupational Psychology Conference, Brighton, UK.
- McTigue, K., Harris, R., Hemphill, B., Lux, L., Sutton, S., et al. (2003). Screening and interventions for obesity in adults: Summary of the evidence for U.S. preventative services task force. *Annals of Internal Medicine* 139(11), 933-949.
- Meyer, A. (1922). The philosophy of occupation therapy. *Archives of Occupational Therapy*, 1(1), 1-10.
- Monk, T., Essex, M., Smider, N., Klein, M., Lowe, K., & Kupfer, D. (1996). The impact of the birth of a baby on the time structure and social mixture of a couple's life and its consequences for well being. *Journal of Applied Social Psychology*, 26(14), 1237-1258.
- Monk, T., Frank, E., Potts, J., & Kupfer, D. (2002). A simple way to measure daily lifestyle regularity. *Journal of Sleep Research*, 11(3), 183-190.
- Monk, T., Kupfer, D., Frank, E., & Ritenour, A. (1991). The social rhythm metric - measuring daily social rhythms over 12 weeks. *Psychiatry Research*, 36(2), 195-207.
- Monk, T., Petrie, S., Hayes, A., & Kupfer, D. (1994). Regularity of daily life in relation to personality, age, gender, sleep quality and circadian rhythms. *Journal of Sleep Research*, 3(4), 196-205.
- Monk, T., Reynolds, C., Buysse, D., DeGrazia, J., & Kupfer, D. (2003). The relationship between lifestyle regularity and subjective sleep quality. *Chronobiology International*, 20(1), 97-107.
- Monk, T., Reynolds, C., Kupfer, D., Hoch, C., Carrier, J., & Houck, P. (1997). Differences over the life span in daily life-style regularity. *Chronobiology International*, 14(3), 295-306.
- Murray, C. J. L., & Lopez, A. D. (Eds.). (1996). *The global burden of disease: A comprehensive assessment of mortality and disability from diseases, injuries and risk factors in 1990 and projected to 2020* (Vol. 1). Cambridge, MA: Harvard School of Public Health.
- O'Neil, R., & Greenberger, E. (1994). Patterns of commitment to work and parenting: Implications for role strain. *Journal of Marriage & the Family*, 56(1), 101-112.
- Perlow, L. A. (1999). The time famine: Toward a sociology of work time. *Administrative Science Quarterly*, 44(1), 57-81.
- Persson, D., Eklund, M., & Isacson, Å. (1999). The experience of everyday occupations and its relation to sense of coherence: A methodological study. *Journal of Occupational Science*, 6(1), 13-26.
- Pierce, D. E. (2003). *Occupation by design: Building therapeutic power*. Philadelphia: F.A. Davis.
- Primeau, L. A. (1996). Work and leisure: Transcending the dichotomy. *American Journal of Occupational Therapy*, 50(7), 567-577.
- Rechtschaffen, A. (1998). Current perspectives on the function of sleep. *Perspectives in Biology and Medicine*, 41, 359-390.
- Reis, H. T., & Gable, S. L. (2000). Event sampling and other methods for studying daily experience. In H. Reis & M. Judd (Eds.), *Handbook of research methods in social and personality psychology* (pp. 190-222). New York: Cambridge University Press.
- Reitzes, D. C., & Mutran, E. J. (2002). Self concept as the organization of roles. *The Sociological Quarterly*, 43(4), 647-667.
- Richter, C. (1967). Sleep and activity: Their relation to the 24 hour clock. In Kety, S. S., Evart, E. V. & Williams, H. L. (Eds.), *Sleep and altered states of consciousness* (Vol. 45, pp. 8-29). Baltimore: Williams and Wilkins.
- Robinson, J. P., & Godbey, G. (1997). *Time for life: The surprising ways Americans use their time*. University Park, PA: The Pennsylvania University Press.
- Robinson, J. P., & Bostrom, A. (1994). The overestimated workweek: What time diary measures suggest. *Monthly Labor Review*, 117(8), 11-23.
- Rosenwasser, A., & Wirz-Justice, A. (1997). Circadian rhythms and depression: Clinical and experimental models. In P. Redfern & B. Lemmer (Eds.), *Physiology and pharmacology of biological rhythms* (pp. 457-486). Berlin: Springer-Verlag.
- Rossi, A. (1962). Some pre-World War II antecedents of community mental health theory and practice. *Mental Hygiene*, 46, 78-98.
- Ryan, R. (1995). Psychological needs and the facilitation of integrative processes. *Journal of Personality*, 63(3), 397-427.
- Ryan, R., & Deci, E. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development and well-being. *American Psychologist*, 55, 68-78.
- Ryff, C. (1995). Psychological well-being in adult life. *Current Directions in Psychological Science*, 4, 99-104.
- Ryff, C., & Keyes, C. (1995). The structure of psychological well-being revisited. *Journal of Personality and Social Psychology*, 69, 719-727.
- Ryff, C., & Singer, B. (1996). Psychological well-being: Meaning, measurement, and implications for psychotherapy research. *Psychotherapy and Psychosomatics*, 65, 14-23.
- Ryff, C., & Singer, B. (1998). The role of purpose in life and personal growth in positive human health. In P. Wong & P. Fry (Eds.), *The human quest for meaning: A handbook of psychological research and clinical applications* (pp. 213-235). Mahwah, NJ: Lawrence Erlbaum.
- Sears, H. A., & Galambos, N. L. (1993). The employed mother's well-being. In J. Frankel (Ed.), *The employed mother and the family context* (pp. 49-67). New York: Springer Publishing.

- Seeman, T., Singer, B., Ryff, C., Love, G., & Levy-Storms, L. (2002). Social relationships, gender, and allostatic load across two age cohorts. *Psychosomatic Medicine*, *64*, 382-394.
- Selye, H. (1946). The general adaptation syndrome and the diseases of adaptation. *Journal of Clinical Endocrinology*, *6*, 117-230.
- Shear, M., Randall, J., Monk, T., Ritenour, A., Tu, X., Frank, E., et al. (1994). Social rhythm in anxiety disorder patients. *Anxiety*, *1*(2), 90-95.
- Sheldon, K., Elliot, A., & Kim, Y. (2001). What is satisfying about satisfying events? Testing 10 candidate psychological needs. *Journal of Personality and Social Psychology*, *80*(2), 325-339.
- Siegrist, J. (2000). Place, social exchange and health: Proposed sociological framework. *Social Science & Medicine*, *128*, 1283-1293.
- Simon, R. W. (1995). Gender, multiple roles, role meaning, and mental health. *Journal of Health & Social Behavior*, *36*(2), 182-194.
- Slagle, E. C. (1922). Training aids for mental patients. *Archives of Occupational Therapy*, *1*, 11-17.
- Smedley, B., & Syme, S. (Eds.). (2000). *Promoting health: Intervention strategies from social and behavioral research*. Washington, DC: National Academy Press.
- Sternberg, E. (1997). Emotions and disease: From balance of humors to balance of molecules. *Natural Medicine*, *3*, 264-267.
- Tenbrunsel, A., Brett, J., Mao, E., Stroh, L., & Reilly, A. (1995). Dynamic and static work-family relationships. *Organizational Behavior and Human Decision Processes*, *83*, 233-246.
- Thompson, J., & Bunderson, J. (2001). Work-nonwork conflict and the phenomenology of time: Beyond the balance metaphor. *Work and Occupations*, *28*(1), 17-39.
- Tingey, H., Kiger, G., & Riley, P. J. (1996). Juggling multiple roles: Perceptions of working mothers. *The Social Science Journal*, *33*(2), 183-191.
- Townsend, E., & Wilcock, A. (2004). Occupational justice. In C. Christiansen & E. Townsend (Eds.), *Introduction to Occupation: The art and science of living* (pp. 243-273). Upper Saddle Hill, NJ: Pearson Education.
- Veenhoven, R. (2000). The four qualities of life. *Journal of Happiness Studies*, *1*(1), 1-39.
- Velde, B., & Fidler, G. (2002). *Lifestyle performance, a model for engaging the power of occupation*. Thorofare, NJ: Slack.
- Verbrugge, L. M. (1983). Multiple roles and physical health of women and men. *Journal of Health & Social Behavior*, *24*, 16-30.
- Vingerhoets, A., Van Huijgevoort, M., & Van Heck, G. (2002). Leisure sickness: A pilot study on its prevalence, phenomenology and background. *Psychotherapy and Psychosomatics*, *71*(6), 311-317.
- Voydanoff, P., & Donnelly, B. W. (1999). Multiple roles and psychological distress: The intersection of the paid worker, spouse, and parent roles with the role of the adult child. *Journal of Marriage & the Family*, *61*(3), 725-738.
- Wanous, J., & Zwany, A. (1977). A cross sectional test of needs hierarchy theory. *Organizational Behavior and Human Performance*, *18*, 78-97.
- Waterhouse, J. (1999). Jet-lag and shift work: (1). Circadian rhythms. *Journal of the Royal Society of Medicine*, *92*(8), 398-401.
- Westhorp, P. (2003). Exploring balance as a concept in occupational science. *Journal of Occupational Science*, *10*(2), 99-106.
- Whiteford, G. (2004). When people can't participate: Occupational deprivation. In C. Christiansen & E. Townsend (Eds.), *Introduction to occupation: The art and science of living* (pp. 221-242). Upper Saddle River, NJ: Prentice-Hall.
- Wicker, F. W., Brown, G., Wiehe, J. A., Hagen, A. S., & Reed, J. L. (1993). On reconsidering Maslow: An examination of the deprivation/domination proposition. *Journal of Research in Personality*, *27*, 118-133.
- Wicker, F. W., & Wiehe, J. A. (1999). An experimental study of Maslow's deprivation-domination proposition. *Perceptual and Motor Skills*, *88*(3), 1356-1358.
- Wicker, F. W., Wiehe, J. A., Hagen, A. S., & Brown, G. (1994). From wishing to intending - differences in salience of positive versus negative consequences. *Journal of Personality*, *62*(3), 347-368.
- Wilcock, A. A. (1998). *An occupational perspective of health*. Thorofare, NJ: Slack.
- Wolff, H. G., & Goodell, H. (1968). *Stress and disease* (2nd ed.). Springfield, IL: Charles C. Thomas.
- Wolff, H. G., Wolff, S. G., & Hare, C. C. (Eds.). (1950). *Life stress and bodily disease*. Baltimore: Williams & Wilkins.
- World Health Organization. (1986). *Ottawa charter for health promotion*. Geneva: World Health Organization.
- Yarcheski, A., Mahon, N., Yarcheski, T., & Cannella, B. (2004). A meta analysis of predictors of positive health practices. *Journal of Nursing Scholarship*, *36*(2), 102-108.
- Zerubavel, E. (1979). Private time and public time: The temporal structure of social accessibility and professional commitments. *Social Forces*, *58*(1), 38-58.
- Zuzanek, J. (1998a). Non-response in time-use surveys: Do the two ends meet? *Leisure and Society*, *21*(2), 547-584.
- Zuzanek, J. (1998b). Time-use, time pressure, personal stress, mental health and life satisfaction from a life cycle perspective. *Journal of Occupational Science*, *5*(1), 25-37.