Accepted Version: Accepted by Journal of Occupational Science on 7th November 2014

Synchronisation: Co-ordinating Time and Occupation

Susan Pemberton & Diane L. Cox

Susan Pemberton, PhD, MSc, BHSc(Hons), DipCOT, Therapy Director, Yorkshire Fatigue Clinic, York, United Kingdom

Diane L. Cox, PhD, MSc, Dip COT, CLTHE, Professor of Occupational Therapy, Director of Research & Head of Graduate School University of Cumbria, United Kingdom
Correspondence to:

sue@yorkshirefatigueclinic.co.uk

Time and occupation are intrinsically linked, as time defines occupation and occupation gives meaning to time. This article examines the dynamic relationship between time and occupation. Occupational concepts such as engagement, presence and balance are explored in the context of this relationship. A framework is proposed for synthesising existing occupational concepts and temporal perspectives. Within the framework we conceptualise the action of synchronisation as the harmonious co-ordination of time and occupation that enhances well-being. The proposed model integrates the additional dimensions of time, namely tempo and temporality, and reintroduces the importance of rhythm, physiological cycles and human consciousness within the experience of time. The relevance of synchronisation to the human experience of occupation and the essence of doing, being and becoming are discussed

Keywords: Time, Occupation, Synchronisation, Tempo

Creek (2003) defined occupation as a 'synthesis of doing, being and becoming that is central to the everyday life of every person and that provides longitudinal organisation of time and effort' (p. 32). Whilst the term *activity* is used to define a specific action or category of action, an *occupation* is a personally defined, one time experience within a unique context (Pierce, 2001). It encapsulates egocentric, exocentric and consensual elements, as occupation engages the mind, body, time, space and social relationships (Breines, 1995). Each of these definitions demonstrates how time and occupation are phenomena that are intrinsically connected. In this paper we discuss time and occupation in relation to key concepts, such as occupational engagement, occupational presence, and occupational balance. A unifying framework is proposed that synthesises these concepts and makes connections to doing, being and becoming.

Wilcock (1999) previously proposed that there is a present day imbalance in doing, with some people doing too much, and that harmony is needed between doing well, well-being and becoming healthy. We have shown that disruptions of time use, tempo and temporality are experienced by people with chronic fatigue (Pemberton & Cox, 2013). Others have identified that there is increasing time pressure as every moment of the day fills with constant activity (Larson & Zemke, 2003; Roxburgh, 2004) and increasing speed (Darier, 1998; Tranter, 2013). Human beings are becoming closer to the ideal of the machine, constantly in motion and abstracted from the rhythms of nature (Persson & Erlandsson, 2002). Consequently, we believe that it is timely to consider the broader implications of time and temporality for occupational science as the pace of life appears to constantly be increasing.

Temporal Dimensions of Doing, Being and Becoming: Clock Time or Event Time

Engaging in occupations can be thought of as a natural consumer of time (Wilcock 1998). In our previously published critical review, we highlighted the primary focus in research given to time use as a means of understanding occupational engagement (Pemberton & Cox, 2011). Hence, *time use* is often the measure of the act of 'doing' and is based upon time as duration or clock time. Time use has been used as an indicator of occupational balance (Tudor-Locke, Leonardi, Johnson & Katzmarzyk, 2011; Wagman, Hakansson & Bjorklund., 2012), and time pressure can lead to potential loss in our occupational lives (Tranter, 2013).

Occupational science encompasses *temporality* as a central construct of occupation (Whiteford, Townsend, & Hocking, 2000). Temporality is concerned with understanding the apprehension of time; the lived experiences in which our sense of time appears (Husserl, 1964). Heidegger (1962) argued that being can only be understood on the basis of the temporal interpretation of being. These perspectives give insight into how individuals experience time, introducing the concept of humans' sense of past, present and future. Zemke and Clark (1996) proposed situating occupational beings within the context of both time and space, and that occupatio-temporality is the shaping of human experience of time through the process of occupation.

Levine (2006) suggested that "how we construct and use our time, in the end, defines the texture and quality of our existence" (pp. 224). He utilised pace of life studies to derive the principal factors that determine the *tempo* of cultures around the world. One of the cultural concepts discussed by Levine (2006) is the notion of *clock time* and *event time* cultures. In clock time cultures, the clock is used to schedule the beginning and end of specific occupations. Time becomes a valuable commodity in

which waiting is waste and productivity is paramount. In event time cultures, occupations begin and end by mutual consensus. They occur simultaneously and sometimes spontaneously. Time is more socially derived, flexible and waiting may be as valuable to the process as doing.

We suggest that this difference in global cultural experiences of time also influences the aspect of becoming. Kantartzis and Molineux (2011) have proposed that current understandings of occupation and focus on clock time is influenced by western cultural concepts. In event time more emphasis is given to the present and allowing the future to emerge from being, whilst in clock time the focus is on future acts of doing and being goal directed.

The dominance of clock time from the world's previous affiliation to event time arose from the dawn of industrialisation and led to significant changes to occupational patterns (Thompson, 1967). The introduction of global standard time enabled increasing global communication and mass synchronisation of people's occupations (Menzies, 2005). The clock, and subsequently the computer, have enabled the growth of technology and been a symbol of science and progress, with increasing accuracy to the measurement of time. Furthermore, as occupational beings, people now live in an era in which time as it is understood is dissolving, as past, present and future are merged through timeless technologies (Lee & Whitely, 2002).

Humans are now linked into a virtual world within *iTime* (Agger, 2011) that is constantly accessible and isolated from a more natural ebb and flow. As virtual activity increases, there is a risk of a loss of connection to temporally and contextually bound occupation. In addition, the complex rhythms and tempo of contemporary domestic lives require patterns of daily existence to be increasingly orchestrated and synchronised (Nansen, Arnold, Gibbs & Davis, 2009). These changes in the

relationship between time and occuaption need to be considered within occupational science and how doing, being and becoming are conceptualised within a modern world that is losing its connections to the natural environment. This concern has led us to reconsider historical and current occupational concepts and temporal perspectives and how these could be synthesised to provide a more comprehensive framework for conceptualising the connections between time and occupation. However, before we introduce the proposed model we will review the theory on time and occupation.

Theory on Time and Occupation

Farnworth (2003) argued that intrinsic to the philosophies of occupation is the pace of life connected to humans' biological rhythms (tempo), their subjective perception of the past, present and future (temporality), what they do with their time and why (time use). Meyer in 1922 (1922/1977) suggested the importance of the reciprocal relationship between time and occupation. He defined aspects of using time and awareness of time, interconnected with the process of doing, and importantly, the rhythm and harmony of their connection. Occupational paradigms have continued to embrace the role of occupation in filling time and the need for balance in the time division between work, rest, and play (Wilcock, 1998). However, the role of time within occupation was skewed by the increased focus on productivity and clock time, and the dimensions of harmony and rhythm became lost (Pemberton & Cox, 2011). Whilst there has been a renaissance in occupational science for temporality, there remains a need to integrate all of the values proposed by Meyer with later developments in occupational theory, returning to his emphasis on the process of harmony and interplay between temporal and occupational factors, incorporating rhythm.

Wilcock (1998) suggested that time use is an expression of doing, as occupation is a consumer of time. Therefore, we suggest that the notion of time use or measurement of time by occupation fits with the domain of doing and praxis, separating it from awareness. Time awareness can be aligned with the concept of temporality or the sense of self within time. This dimension would encompass the Dynamic Occupation in Time Model developed by Larson (2004) to address variations in temporality that people may experience between perceived time and clock time, such as loss of synchronicity, protraction, compression, disruption and flow.

In addition, the notion of rhythm originally described by Meyer as recurring cycles, such as sleep and hunger, can now be integrated with the known physiological cycles within the human body, such as hypothalamic-pituitary-adrenal axis function and circadian rhythms. Disruption or lack of internal or external synchronisation of circadian rhythms can lead to severe consequences for the health of an organism (Turek, 1998). Tempo encapsulates these biological rhythms and the flow of energy in time in relation to our environment (Farnworth, 2003). Thus, this aligns Meyer's original model with the later developed divisions of time use, tempo and temporality (Farnworth, 2003; Farnworth & Fossey, 2003), as illustrated in Figure 1. In addition, Meyer's description of harmony could be translated to the active process of synchronising and balancing each of the dimensions to reach an optimal state of homeostasis and well-being. This reflects the essence of weaving together occupation and time through rhythm, tempo, synchronisation, sequencing and enfoldment, as advocated by Larson and Zemke (2003).

<Insert Figure 1: Proposed adaptation of Meyer's model>

Occupational Engagement, Occupational Presence, Occupational Balance and Occupational Rhythm

Aligning existing theories of time domains in relation to understanding the experience of occupation leads to consideration of how this may relate to current occupational concepts, of engagement, presence, balance and rhythm. Meyer's intention in outlining the relationship between time and occupation was to support the application of occupation as a medium for improving well-being. He defined this as the functions of work, rest, play and sleep. Therefore, at the fulcrum of the intersection of time use, tempo and temporality is the individual's experience of *occupational engagement* or participation (see Figure 2). Through occupational engagement people exist as occupational beings and occupational engagement has an important relationship to health (Chilvers, Corr & Singlehurst., 2010; Yerxa, 1998). Consequently disruptions within these domains may influence occupational engagement and therefore, well-being.

<Insert Figure 2: The relationship between aspects of time and occupational concepts>

Other occupational concepts that reflect a temporal relationship can also be considered within this framework. *Occupational presence* has been defined as the consciousness of the self being engaged in occupation in place (Reid, 2005). However Zemke and Clark (1996) previously suggested that human occupation occurs within a matrix of both time and space, thus extending occupational presence to include sense of self in time as well as place. Therefore, the intersection between the act of doing and the sense of self within time would encompass the concept of occupational presence. This also incorporates the experience of time itself during occupation or *occupatio-temporality* (Larson 2004; Larson & von Eye, 2010; Larson & Zemke,

2003). Hence people may experience time differently during occupation, for example, in terms of flow (Csikszentmihalyi, 1988) or time compression (Larson, 2004).

Drawing on Meyer's foundation, the term *occupational balance* or life balance is interpreted as how time is divided between different types of occupations, such as work, rest, play and sleep (Christiansen & Matuska, 2006; Matuska & Christiansen, 2008, 2009). The distribution of time between types of tasks, such as obligatory or discretionary, has remained consistent across western societies but quantifying time does not elucidate the qualitative difference in the experience of such time allocation (Christiansen, 1996). This is illustrated by the increasing demands and intensity of leisure occupations (Primeau, 1995). Therefore, occupational balance relates both to time use (Wagman et al., 2012) and to tempo, through the patterns created in how individual occupations are interwoven and their impact on biological rhythms.

Clark (1997) highlighted that an increasing pace of life would lead to doing without being. Historically, the notion of being has been the least considered and explored within occupational science (Pemberton & Cox, 2011). A person's daily personal rhythms are influenced by his or her sense of time and expectations in relation to time. The clock time perspective that time is a valuable commodity influences beliefs about wasting time and completion of tasks, increasing the tempo of occupations and reducing the experience of pauses in time. This relationship therefore incorporates a faster pace of life and the influence of occupational identity, defined as "the composite sense of who one is and wishes to become as an occupational being" (Kielhofner, 2008, pp. 106). A person's sense of present and future self will therefore influence the number of occupations engaged in concurrently and the speed of doing. A new concept of *occupational rhythm* in the intersection between tempo and temporality is proposed to encapsulate this. This concept reflects the internal

metronome setting the pace of daily life based on individual's expectations and perceptions of how time should be experienced, including whether he or she has a clock time or event time perspective.

With a quickening in occupational rhythm, it is hypothesised that there would be concurrent increased allostatic load, a measure of the physiological consequences of exposure to cumulative stress, as the body adapts to increased frequency of changes (Maloney, Boneva, Lin, & Reeves William, 2010). An individual's sense of time pressure will influence occupational rhythms, with feeling rushed more commonly experienced by women (Mattingly & Sayer, 2006; Southerton & Tomlinson, 2005).

As well as the amount of time available to complete tasks, Southerton and Tomlinson (2005) considered that lack of shared temporal boundaries, disrupting the co-ordination of social practices with others, and the loss of boundaries of a task to a particular time of day have contributed to 'harriedness' in the rhythms of daily life. It has also been found that the experience of too high or low levels of time pressure can affect mood and lead to emotional exhaustion (Teuchmann, Totterdell, & Parker, 1999). Therefore, enhancing perceived control over task and time can lead to improved well-being. This perception of control requires there to be the right balance in daily activities and that these harmonise with experiences of personal and social temporalities.

Consequently Meyer's model can be expanded to consider the intersections between the dimensions of doing, time awareness and biological rhythm, introducing into the model occupational presence, occupational balance and occupational rhythm. At the convergence of time use, tempo and temporality, enhanced through presence, balance and rhythm, is the interaction between the self and the environment through occupation, or *occupational engagement* (represented in Figure 2). This continues to

encompass Meyer's derivatives of occupation, namely work, rest, play, and sleep (Meyer, 1922/1977) but also reflects an enhanced understanding of the qualities of occupation. Consequently the components from the original framework and subsequent theories can be combined within a more comprehensive representation of time and occupation.

Contextualising Time and Occupation

In the discussion so far we have presented a conceptualisation of the different manifestations through which time and occupation can be experienced and expressed. However it is also important in relation to both time and occupation to consider the context of this in terms of individuals and their environment. We have therefore developed the concept further as illustrated in figure 3.

Following Heidegger's (1962) argument that humans' unique sense of being exists within a sense of time, the nomenclature of *self* has been used as a construction of both physical and psychological being. Baumeister (2011) suggested that "self begins with the physical body, with acting and choosing as a unity, and as a point of reference distinct from others, and it acquires meaningful content by participating in the social system" (p. 48). Occupation makes a unique contribution to the understanding of self (Carlson, Park, Kuo, & Clark, 2012) and encompasses concepts such as occupational identity (Kielhofner, 2008).

Within the proposed model of synchronisation between time and occupation (Figure 3), the term *environment* represents physical, social, cultural and temporal contexts that the self operates within. The self is influenced by the world in which it exists and the world is understood through our experience of it (Baumeister, 2011). Kielhofner (1992) described this as an open system cycle, with intake and output of

information and energy from and to the environment. This system encompasses the proposition that within time people experience both internal processes (Wittman, 2009) and external influences (Droit-Volet & Gil, 2009) which slow down or speed up the sense of time. As such individuals' sense of the self in time and the sense of the world in time is a continuous domain, rather than completely separate entities. Time is both a context for occupation and a commodity for consumption through occupation. Time and occupation form connections between the self and the physical and social world, Larson and Zemke (2003) and Levine's (2006) arguments about the role of time in social structures and society. Hence, living within a clock time or event time culture influences humans' relationship to occupation.

The Conceptualisation of Synchronising

The term *synchronise* is referenced within some occupational theories related to time (Larson 2004; Larson & Zemke, 2003). To synchronise means to adjust in time or manner, being in time with or matching in movement or operation together. Larson (2004) proposed that synchronicity is the perception of a match between clock time and perceived time, indicating that this was one perspective of temporality as experienced during occupations. Although Larson confined synchronisation to one dimension of temporality within occupation, we propose that it is an active and dynamic process of connectivity between time and occupation, shaping the experience of the self within the world (represented by the encompassing outer circle on Figure 3).

Whilst Kielhofner (1977) focused on temporal adaptation in terms of patterns of habituation and time use, Christiansen and Baum (1997) advocated that greater balance is also given to the physiological and cognitive experience of time. Doing so

through expanding the dimensions of time to include tempo, temporality and time use implies a need to expand the definition of synchronisation beyond that of correlation between the external clock and perception of time. It is proposed that synchronisation can be enhanced by the state of being present, rather than focusing ahead on future or competing tasks. This resonates with occupational presence, where the concept of being present enhances the experience of occupational engagement (Reid, 2005, 2008, 2011).

Therefore, the process of synchronising is proposed as the act of constant adjustment between all these elements of occupation and time in order to match these with both internal psychological and biological processes and the external environment, including both the physical and social world (see Figure 3). Occupational engagement is enabled or limited through this process of synchronisation. Synchronisation encompasses all domains of time, including time use (the match between time passing and participation in valued occupations), tempo (the match between the biological rhythms and speed of occupations), and temporality (being present to enhance occupational engagement).

<Insert Figure 3: A proposed model of synchronisation between time and occupation>

If people have previously accelerated their performance of occupations within time and have expectations of constant motion (Pemberton & Cox, 2014, 2013), it can be difficult to adjust to the perpetuating limitations and slowness of chronic illness. Participants in our previous studies described difficulties prior to illness of correlating time with activity, previously underestimating how much time occupations would take and therefore constantly accelerating to keep up with their planned occupations within the available time frame. Other studies have shown health consequences to

experiencing time pressure, such as negative mood (Teuchmann, Totterdell & Parker, 1999) and failure to take rest and remaining active, such as in irritable bowel syndrome (Creed, 2007). These findings demonstrate that synchronicity needs to extend beyond clock time and perceived time during occupation to also include estimations of occupational duration and the influence of expectations related to occupations. Therefore, there can be a lack of congruence or harmony between perceptions of occupation, time, and identify formed around past abilities and current function.

Interaction with the physical and social environments is an important factor in maintaining synchrony between rhythms within the individual, and between the individual and their world (Christiansen, 1996). Ill health can cause a loss of connection to the natural rhythms of days and nights, with changes in sleep and wake cycles. As disruption or lack of synchrony in circadian rhythms can lead to severe consequences for health (Turek, 1998), there is a need to enhance the match between human biological rhythms and patterns of daily life (Christiansen, 1996; Christiansen & Matuska, 2006). This need was demonstrated by Berger, Wielgus, Hertzog, Fischer & Farr (2010), who found that sleep intervention improved fatigue in women undergoing treatment for breast cancer, whilst interpersonal social rhythm therapy to regulate social zeitgebers has been suggested for depression (Boyce & Barriball, 2010). These therapies aim to increase synchronisation between the body and its entrainment to natural cycles, such as night and day. Thus, optimising natural biological rhythms can be a medium through which to counter the rhythms imposed by the industrial world (Adam, 1995).

Rhythm also implies regulation of speed. Members of western societies now live with an impulse for constant busyness and increased speed (Jones, Burke &

Westerman, 2013; Lunau, Bambra, Eikemo,van der Wel & Dragano, 2014). The process of slowing down and accepting slowness can be an important part of resychonisation between occupation, time and environment. Garhammer (2002) proposed that slowing down is a strategy for individuals to enhance their quality of life. He argued that slowing down enables people to go deeper into the quality of an experience. It also allows an occupation to exist within the time duration that is required to be present within the task, and not to be operating in the protentions of the emerging future. Using routines and pacing to establish a tempo and rhythm to the day was also previously suggested in a study of old age (Jackson, 1996). Therefore, synchronising may involve decreasing speed to enhance the operation of time and activity or adopting different patterns that may increase the opportunity for synchronisation within daily structures. This may be contrary to the desire to return to increased speed and occupation , suggesting a need for maintaning harmonious rhythms to sustain synchronicity.

Slowing action increases the opportunity to be mindful in that moment (Reid, 2009) and to therefore enhance awareness of physiological and sensory changes, such as increasing fatigue. It provides time to take action or make adjustments, i.e. to synchronise, such as by stopping a task before it is completed. Elliot (2011) argued that time quickens whilst people are in a flow state, in mindfulness time can be slow. Thus, the quickening experienced in flow reflects the enhanced sympathetic responses found by Gaggioli, Cipresso, Serino and Riva (2013). Therefore, mindfulness could be a tool to assist with the opposite response by slowing thoughts and reactions to facilitate synchronisation.

Another aspect to synchronisation is the change in access to social relationships and marking time through events, congruent with event time. The

concept of synchronisation can be referred to a global process of co-ordinating time and occupation across the expanse of space to increase productivity and commerce (Menzies, 2005). However, people can also seek synchronicity between themselves and their social world or event time, rather than just clock time or *iTime* (Agger, 2011; Levine, 2006). Social synchronicity reinforces the importance of time within social structures, as identified by Larson and Zemke (2003). Therefore, social relationships may also play an integral part in enhancing synchronisation and, as event time cultures have a slower pace of life (Levine & Norenzayan, 1999), having time for social interactions may help with regulating natural rhythms.

Therefore, synchronicity could be defined as harmonious co-ordination or, as Adam (1995) described it, orchestration: of matching between time and occupation, both in the process of tempo regulation to enable engagement and also the anticipation of future actions. Synchronicity is attuned to the individual's circadian rhythms and adjusts to physiological demands, such as hunger and sleep. To facilitate synchronicity, there is is also entrainment to the rhythms of nature and the environment in which the individual exists, such as night and day. Synchronicity enables individuals to have meaningful experiences of events within their physical and social worlds. Internal (such as through infection) or external (such as increasing demand for a 24 hour presence) changes are hypothesised as impacting on synchronisation and altering occupational engagement. This may be a short term effect but, in cases such as chronic illness where disruption is on-going, re-establishing synchronisation may become problematic. Hence it is hypothesised that the process of re-synchronising time and occupation may be an important mechanism in supporting a return to well-being.

Furthermore, adjusting the tempo of action and matching time allocation and task performance can be used to diminish time pressure and support the sustainability of occupations (Pemberton & Cox, 2013). Synchronisation also recognises the importance of temporality and narrative, giving time to grieve for a past active identity and transition to new values and future vision, more congruent with continuing well-being. Consequently there can be a shift in personal beliefs from a focus on doing to being (Pemberton & Cox, 2014), facilitating enhanced occupational presence, balance, rhythm and consequently increased occupational engagement. Ultimately, this shift epitomises Levine's (2006) argument that how we construct and use time defines the quality of our existence.

If adopting the definition of health by Huber et al. (2011), that health is the ability to adapt and manage self, then concepts such as synchronising between the self, occupation and time become vitally important. Processes such as adaptation occur within a framework of time, and are therefore time bound. Hence, improvements in health would indicate increased adaptation and successful management of self. As such, the degree of synchronisation between time and occupation, as experienced by individuals within their unique context, could be seen as a measure of health or well-being. Occupational science acknowledges the role of both time and energy in the orchestration of daily occupations (Zemke & Clark, 1996). In this way, the discipline recognises that human beings are *occupation bound*. With the increasing speed of modernity (Jones et al., 2013), humans have to adopt a new philosophy that harmonises synchronisation that is *time bound* and *occupation bound* not just for the well-being of the individual, but also for the society.

Limitations

In attempting to unify different perspectives on time and occupation within an overarching model, there is a danger that the complexities of each component become simplified and lost. This risk was evident in the loss of temporal focus for occupation with the assimilation of Kielhofner's original work on temporal adaptation within the broader Model of Human Occupation (Kielhofner, 1980, 2008). Emerging theory needs testing and debate to shape it, as theory is an ever-developing entity not a perfected product (Glaser & Strauss, 1967). Therefore, the proposed conceptual framework is presented as a starting point for further research and empirical scrutiny as humanity wrestles with understanding the relationship between time and occupation in the modern world. There is a need to further define these concepts and explore their occurrence across populations within different cultures. However, the challenge for researchers is that time use and clock time are relatively accessible to measurement and quantification, whilst the complexities of rhythm, sense of self in time, and synchronisation are more elusive to capture. This tension reflects the difference between measuring an activity and evidencing occupation.

Conclusion

The integration of time and temporality within the proposed model reintroduces the importance of rhythm, physiological cycles and human consciousness within the experience of time. Key constructs of occupation, such as presence, balance and engagement, can be understood through their relationship to these temporal domains. Humans' biological rhythms and those of society can influence the tempo of occupational rhythm. In this paper we have proposed that how people synchronise these elements can be a mechanism to improve well-being and realign the body with

the natural world. However, with the expansion of the virtual world there are increasing opportunities for activity and occupations, as people lose the imposed restrictions of nature, such as hours of light and geographic distances. In a timeless world, what role is there for occupation that is unique and time dependent? In this constant environment of parallel processing and infinite information, what can the human mind and body synchronise with? Are people pursuing a *timeless, occupation-less* future? One in which human beings increasingly become desynchronised from time and occupation.

Acknowledgements

The authors would like to acknowledge Dr Carol Marrow and Dr Gonzalo Araoz in commenting on and supporting this research, and the support of the University of Cumbria and Leeds and York Partnership Foundation NHS Trust.

References

Adam, B. (1995). *Timewatch: The social analysis of time.* Cambridge: Polity Press.

Agger, B. (2011). iTime: Labor and life in a smartphone era. *Time & Society*, *20*(1), 119-136. doi:10.1177/0961463X10380730

Baumeister, R. F. (2011). Self and identity: A brief overview of what they are, what they do, and how they work. *Annals of the New York Academy of Sciences*, *1234*(1), 48-55. doi:10.1111/j.1749-6632.2011.06224.x

Berger, A., Wielgus, K., Hertzog, M., Fischer, P., & Farr, L. (2010). Patterns of circadian activity rhythms and their relationship with fatigue and anxiety/depression in women treated with breast cancer adjuvant chemotherapy. *Supportive Care in Cancer*, *18*(1), 105-114. doi:10.1007/s00520-009-0636-0

Boyce, P., & Barriball, E. (2010). Circadian rhythms and depression. *Australian Family Physician*, *39*(5), 307-310.

Breines, E. (1995). Understanding 'occupation' as the founders did. *British Journal of Occupational Therapy*, *58*(11), 458-459.

Carlson, M., Park, D., Kuo, A., & Clark, F. (2012). Occupation in relation to the self. *Journal of Occupational Science.* doi:10.1080/14427591.2012.727356

Chilvers, R., Corr, S., & Singlehurst, H. (2010). Investigation into the occupational lives of healthy older people through their use of time. *Australian Occupational Therapy Journal*, *57*(1), 24-33. doi:10.1111/j.1440-1630.2009.00845.x

Christiansen, C. (1996). Three perspectives of balance in occupation. In R. Zemke & F. Clark (Eds.), *Occupational science: The evolving discipline* (pp. 431-451). Philadelphia: FA Davis.

Christiansen, C., & Baum, C. (1997). *Occupational therapy: Enabling function and well-being.* Thorofare, NJ: Slack.

Christiansen, C., & Matuska, K. (2006). Lifestyle balance: A review of concepts and research. *Journal of Occupational Science*, *13*(1), 49-61. doi:10.1080/14427591.2006.9686570

Clark, F. (1997). Reflections on the human as an occupational being: Biological need, tempo and temporality. *Journal of Occupational Science: Australia*, *4*(3), 86-92. doi:10.1080/14427591.1997.9686424

Creed, F. (2007). Cognitive behavioural model of irritable bowel syndrome. *Gut*, *56*, 1039-1041. doi:10.1136/gut.2006.117143

Creek, J. (2003). *Occupational therapy defined as a complex intervention.* London: College of Occupational Therapists.

Csikzentmihalyi, M. (1988). The flow of experience and its significance for human psychology. In M. Csikzentmihalyi & I. Csikzentmihalyi (Eds.), *Optimal experience: Psychological studies of flow in consciousness* (pp. 15-35). Cambridge: Cambridge University Press.

Darier, E. (1998). Time to be lazy: Work, the enviornment and modern subjectivities. *Time & Society*, *7(*2), 193-208. doi:10.1177/0961463X98007002002

Droit-Volet, S., & Gil, S. (2009). The time-emotion paradox. *Philosophical Transactions of the Royal Society*, *364*, 1943-1953. doi:10.1098/rstb.2009.0013

Elliot, M. (2011). Being mindful about mindfulness: An invitation to extend occupational engagement into the growing mindfulness discourse. *Journal of Occupational Science*, *18*(4), 366-376. doi:10.1080/14427591.2011.610777

Farnworth, L. (2003). Time use, tempo and temporality: Occupational therapy's core business or someone else's business. *Australian Journal of Occupational Therapy*, *50*(3), 116-126. doi:10.1046/j.1440-1630.2003.00391.x

Farnworth, L., & Fossey, E. (2003). Occupational Terminology Interactive Dialogue: Explaining the concepts of time use, tempo and temporality. *Journal of Occupational Science*, *10*(3), 150-153. doi:10.1080/14427591.2003.9686523

Gaggioli, A., Cipresso, P., Serino, S., & Riva, G. (2013). Psychophysiological correlates of flow during daily activities. *Annual Review of Cybertherapy and Telemedicine*, *191*, 65-69. doi:10.3233/978-1-61499-282-0-65

Garhammer, M. (2002). Pace of life and enjoyment of life. *Journal of Happiness Studies*, *3*, 217-256. doi:10.1023/A:1020676100938

Glaser, B., & Strauss, A. (1967). *The discovery of grounded theory.* Chicago: Aldine.

Heidegger, M. (1962.) *Being and time.* Oxford: Blackwell.

Huber, M., Knottnerus, J., Green, L., van der Horst, H., Jadad, A., Kromhout, D., Leonard, B., Lorig, K., Loureiro, M., van der Meer, J., Schnabel, P., Smith, R., van Weel, C., Smid, H. (2011). How should we define health? *British Medical Journal*, *343*(d4163). doi:10.1136/bmj.d4163

Husserl, E. (1964). *The phenomenology of internal time-consciousness.* Bloomington: Indiana University Press.

Jackson, J. (1996). Living a meaningful existence in old age. In R. Zemke & F. Clark (Eds.), *Occupational science: The evolving discipline* (pp. 339-361). Philadelphia: FA Davis.

Jones, F., Burke, R. J., & Westman, M. (Eds.). (2013). *Work-life balance: A psychological perspective*. Hove: Psychology Press.

Kantartzis, S., & Molineux, M. (2011). The influence of Western society's construction of a healthy daily life on the conceptualisation of occupation. *Journal of Occupational Science*, *18*(1), 62-80. doi:10.1080/14427591.2011.566917

Kielhofner, G. (1977). Temporal adaptation: A conceptual framework for occupational therapy. *American Journal of Occupational Therapy*, *31*(4), 235-242. doi:10.5014/ajot.31.4.235

Kielhofner, G. (1980). A Model of Human Occupation, Part 2: Ontogenesis from the perspective of temporal adaptation. *American Journal of Occupational Therapy*, *34*(10), 657-664. doi:10.5014/ajot.34.10.657

Kielhofner, G. (1992). *Conceptual foundations of occupational therapy.* Philadelphia: FA Davis.

Kielhofner, G. (2008). *A model of human occupation: Theory and application* (4th ed.). Baltimore: Lippincott, Williams and Wilkins.

Larson, E. (2004). The time of our lives: The experience of temporality in occupation. *Canadian Journal of Occupational Therapy*, *71*(1), 24-35. doi:10.1177/000841740407100107

Larson, E., & von Eye, A. (2010). Beyond flow: Temporality and participation in everyday activities. *American Journal of Occupational Therapy, 64*(1), 152-163. doi:10.5014/ajot.64.1.152

Larson, E., & Zemke, R. (2003). Shaping the temporal patterns of our lives: The social coordination of activity. *Journal of Occupational Science*, *10*(2), 80-89. doi:10.1080/14427591.2003.9686514

Lee, H., & Whitley, E. 2002. Time and information technology: Temporal impacts on individuals, organizations and society. *The Information Society*, *18*, 235-240. doi:10.1080/01972240290075084

Levine, R. (2006). *A geography of time: The temporal misadventure of a social psychologist.* Oxford: OneWorld.

Levine, R., & Norenzayan, A. (1999). The pace of life in 31 countries. *Journal of Cross-Cultural Psychology*, *30*(2), 178-205. doi:10.1177/0022022199030002003

Lunau, T., Bambra, C., Eikemo, T. A., van der Wel, K. A., & Dragano, N. (2014). A balancing act? Work-life balance, health and well-being in European welfare states. *European Journal of Public Health*, *24*(3), 422-427. doi:10.1093/eurpub/cku010

Maloney, E., Boneva, R., Lin, J. M., & Reeves William, C. (2010). Chronic fatigue syndrome is associated with metabolic syndrome: Results from a case-control study in Georgia. *Metabolism Clinical and Experimental*, *59*, 1351-1357. doi:10.1016/j.metabol.2009.12.019

Mattingly, M., & Sayer, L. (2006). Under pressure: Gender differences in the relationship between free time and feeling rushed. *Journal of Marriage and Family*, *68*, 205-221. doi:10.1111/j.1741-3737.2006.00242.x

Matuska, K., & Christiansen, C. (2008). A proposed model of lifestyle balance. *Journal of Occupational Science*, *15*(1), 9-19. doi:10.1080/14427591.2008.9686602

Matuska, K., & Christiansen, C. (2009). A theoretical model of life balance and imbalance. In K. Matuska & C. Christiansen., (Eds.), *Life balance: Multidisciplinary theories and research* (pp. 149-164). Thorofare: Slack and AOTA Press.

Menzies, H. (2005). *No time - Stress and the crisis of modern life*. Vancouver: Douglas and McIntyre.

Meyer, A. (1922). The philosophy of occupational therapy. *Archives of Occupational Therapy, 1*, 1-10. Reprinted in: (1977). *American Journal of Occupational Therapy, 31*(10), 639-642.

Nansen, B., Arnold, M., Gibbs, M., & Davis, H. (2009). Domestic orchestration: Rhythms in the mediated home. *Time & Society, 18*(2/3), 181-207. doi:10.1177/0961463X09338082

Pemberton, S., & Cox, D. (2011). What happened to the time? The relationship of occupational therapy to time. *British Journal of Occupational Therapy, 74*(2), 78-85. doi:10.4276/030802211X12971689814043

Pemberton, S., & Cox, D. (2013). Perspectives of time and occupation: Experiences of people with chronic fatigue syndrome/myalgic encephalomyelitis. *Journal of Occupational Science, 21*(4), 488-503. doi:10.1080/14427591.2013.804619

Pemberton, S., & Cox, D. (2014). Experiences of daily activity in chronic fatigue syndrome/myalgic encephalomyelitis (CFS/ME) and their implications for rehabilitation programmes. *Disability and Rehabilitation.*,36(21), 1790-7. doi: 10.3109/09638288.2013.874503.

Persson, D., & Erlandsson, L. (2002). Time to reevaluate the machine society: Post-industrial ethics from an occupational perspective. *Journal of Occupational Science, 9*(2), 93-99. doi:10.1080/14427591.2002.9686497

Pierce, D. (2001). Untangling occupation and activity. *American Journal of Occupational Therapy, 55*(2), 138-146. doi:10.5014/ajot.55.2.138

Primeau, L. (1995). Work and leisure: Transcending the dichotomy. *American Journal of Occupational Therapy, 50*(7), 569-577. doi:10.5014/ajot.50.7.569

Reid, D. (2005). A model of occupational presence. *Journal of Occupational Science, 12*(2), 110-113. doi:10.1080/14427591.2005.9686554

Reid, D. (2008). Exploring the relationship between occupational presence, occupational engagement and people's well-being. *Journal of Occupational Science*, *15*(1), 43-47. doi:10.1080/14427591.2008.9686606

Reid, D. (2009). Capturing presence moments: The art of mindful practice in occupational therapy. *Canadian Journal of Occupational Therapy*, *76*(3), 180-188. doi:10.1177/000841740907600307

Reid, D. (2011). Mindfulness and flow in occupational engagement; Presence in doing. *Canadian Journal of Occupational Therapy*, *78*(1), 50-56. doi:10.2182/cjot.2011.78.1.7

Roxburgh, S. (2004). "There just aren't enough hours in the day": The mental health consequences of time pressure. *Journal of Health and Social Behaviour*, *45*(2), 115-131. doi:10.1177/002214650404500201

Southerton, D., & Tomlinson, M. (2005). Pressed for time: The differential impacts of a time squeeze. *Sociological Review*, *53*(2), 215-239. doi:10.1111/j.1467-954X.2005.00511.x

Teuchmann, K., Totterdell, P., & Parker, S. (1999). Rushed, unhappy and drained: An experience sampling study of relations between time pressure, perceived control, mood and emotional exhaustion in a group of accountants. *Journal of Occupational Health Psychology*, *4*(1), 37-54. doi:10.1037/1076-8998.4.1.37

Thompson, E. (1967). Time, work-discipline and industrial capitalism. *Past and Present*, *38*, 56-97. Article Stable URL: http://www.jstor.org/stable/649749

Tudor-Locke, C., Leonardi, C., Johnson, W. D., & Katzmarzyk, P. T. (2011). Time spent in physical activity and sedentary behaviors on the working day: The American time use survey. *Journal of Occupational and Environmental Medicine*, *53*(12), 1382-1387. doi:10.1097/JOM.0b013e31823c1402

Turek, F. (1998). Circadian rhythms. *Hormone Research*, *49*(3-4), 109-113. doi:10.1159/000023155

Wagman, P., Håkansson, C., & Björklund, A. (2012). Occupational balance as used in occupational therapy: A concept analysis. *Scandinavian Journal of Occupational Therapy*, *19*(4), 322-327. doi:10.3109/11038128.2011.596219

Whiteford, G., Townsend, E., & Hocking, C. (2000). Reflections on a renaissance of occupation. *Canadian Journal of Occupational Therapy*, *67*(1), 61-69. doi:10.1177/000841740006700109

Wilcock, A. A. (1998). *An occupational perspective of health.* Thorofare: Slack.

Wilcock, A. (1999). Reflections on doing, being and becoming. *Australian Occupational Therapy Journal*, *46*, 1-11. doi:10.1046/j.1440-1630.1999.00174.x

Wittman, M. (2009). The inner experience of time. *Philosophical Transactions of the Royal Society*, *364*, 1955-1967. doi:10.1098/rstb.2009.0003

Yerxa, E. (1998). Health and the human spirit for occupation. *American Journal of Occupational Therapy*, *52*(6), 412-418. doi:10.5014/ajot.52.6.412

Zemke, R., & Clark, F. (Eds.). (1996). *Occupational science: The evolving discipline.* Philadelphia: FA Davis.

Captions for figures

Figure 1: Proposed Adaptation of Meyer's Model

Figure 2: The Relationship Between Time and Occupational Concepts

Figure 3: A Proposed Model of Synchronisation Between Time and Occupation