Towards Daily Function Homeostasis: A Conceptual Health Framework and Keys for Action

Sara Rosenblum*

Department of Occupational Therapy, University of Haifa, Israel

*Corresponding author: Sara Rosenblum, Department of Occupational Therapy, University of Haifa, Faculty of Social Welfare and Health Sciences, The Laboratory of Complex Human Activity and Participation (CHAP), Mount Carmel, Haifa 3498838, Israel, Tel: +972-4-8240474, Fax: +972-4-8249753, E-mail: rosens@research.haifa.ac.il

Abstract
Homeostasis refers to the organism’s internal self-regulation process that plays a major role in maintaining a balanced, harmonic and steady-state condition. The aim of this paper is to present a comprehensive conceptual framework for developing daily functional homeostasis, which illustrates the control, harmony and balance of daily life activities and routines. This framework provides a systematic procedure for revealing the person’s true desired self (who I am) by providing reflective key points. These points include environmental and personal factors, life events, past experiences and key points in the context of disease or disability. Dimensions of a person’s activities and participation, such as what, where, when, why and how they are performed, can provide new insights stimulating daily functional changes. The analysis facilitated by the framework considers the person’s life goals and identifies gaps or conflicts that challenge their achievement. Moreover, utilizing a person’s strengths to develop adaptive changes may circumvent existing barriers and lead to improved sense of control, self-fulfillment, life satisfaction, health and well-being.

Keywords
Homeostasis, Function, Activities and participation, Goals, Well-being

Introduction
The mythologist Joseph Campbell asked, “Is life a problem to be solved, or a mystery to be lived?”. The complexity and multidimensionality of the concept of life as a self-sustaining process that distinguishes living organisms from other objects has been discussed for years and published by authors such as Klemke [1]. Ongoing processes attributed to living organisms include maintaining homeostasis and adaptation to the environment [2]. The term homeostasis derives from the combination of the Greek words “homeo” or constant, and “stasis” or stable, and is defined as remaining stable or staying the same [3]. It relates to physiological mechanisms needed to sustain life by responding and adapting to changing environmental conditions, while investing energy to maintain order [4]. Thus, it refers to the organism’s internal self-regulation process that plays a major role in maintaining a constantly balanced, harmonic and steady-state condition [5].

The concept of homeostasis is largely discussed in the literature within the context of biological and physiological processes. However, throughout the life cycle humans need to modify their behavior to adapt to daily activities [6]. Studies that associate the concept of homeostasis to human behavior focus mainly on socio-emotional and psychological behavioural adaptations or adjustments in response to stressful events, e.g., [3, 7]. Yet, literature examining implementation of this concept to day-to-day activities in relation to persons’ academic, social and leisure and work pursuits is absent. Moreover, no theoretical framework has comprehensively captured the conceptualization of how individuals create or develop daily functional homeostasis as manifested in the control, harmony and balance of their daily life activities and routines.

Conceptual Foundations and Purpose of the Daily Function Homeostasis
The Daily Function Homeostasis (Day-Fun-Home) philosophical framework was founded on the literature and extensive research that focus on human daily functioning throughout the life span. Three main resources lead to the framework’s core concepts and structure. The first is the...
philosophical base of occupational therapy and occupational science [8-11]. Secondly, results of interviews with children, adults and seniors that were conducted by the author and focused on their daily function (e.g., [12-15]). Lastly, results of studies that capture the characteristics of decrease in activity performance, for example handwriting and daily function due to aging [16] or varied pathologies such as Alzheimer’s disease [17], Parkinson’s disease [18], and depression [19] (http://chap.haifa.ac.il/index.php/handwriting for more details).

The framework’s purpose is to allow persons to identify and map out their daily functioning characteristics to improve their awareness and to develop insights into their daily homeostasis.

Several arguments support the need for this framework. First, the idea arises from the International Classification of Functioning Disability and Health (ICF) [20]; the World Health Organization’s framework for measuring health and disability, in conjunction with the worldwide movement towards personalized medicine [21]. The ICF classification has extended the concept of health, framing it as a multidimensional construct that encompasses the psychological and social dimensions of people’s lives in addition to its biomedical constituents [22]. Pursuant to the ICF daily activities and participation in life situations are central and integral concepts to the person’s status within the health-disability and disease continuum [23]. By considering the ICF concepts together with the social cognitive theory [24], it can be posited that people’s self-regulatory skills, such as how they manage their daily functioning, impacts the promotion of their health and prevention of disease.

Indeed, research has revealed reciprocity between unbalanced life-styles, the circadian cycle, hormonal and endocri...
Consequently, “Do I wish to continue living in the sphere of these influences, or would a change be beneficial?” Moreover, consideration is warranted as to the physical and human barriers and opportunities within the person’s environment. For example, exposure to natural environments may have a mediating effect on human well-being, while a valued mentor may influence one’s career or work environment [42]. Other factors include a person’s socio-economic status, place of residence, and the social circles he or she belongs or wishes to belong to.

Further environmental questions may be asked when considering the “environmental press” model [43] that describes the tension between environmental demands and the person’s needs, competencies and strengths. Relevant questions that can be asked may be “What are the environmental demands that I must contend with?”, “Am I wish/able to meet them?”, “Are my choices based on my inner desires or are they the product of the values/preferences of other people in my social environment (i.e., family, friends, co-workers)?” Answers to such questions may lead to better insight and constitute a primary stage in improving the “fit” between the person’s desires and environmental demands.

**WHO?**

The ‘who’ construct conveys the person seeking change and encompasses five components and the multi-directional relationships between them.

**Environmental factors:** A person’s environment represents a source of opportunities, resources, barriers, demands and constraints and the person’s interactions with his environments may either enhance or inhibit his development [39]. Therefore, environmental contexts such as the family and extending distally to friends, communities, institutions and cultures must be considered to fully understand how people function [40,41]. Thus, environmental theories raise several fundamental questions such as, “How did the environment where I was born and where I grew up impact my consequent development?”; “How did my socio-cultural background and the significant people in my life influence my choices and daily occupations?” and consequently, “Do I wish to continue living in the sphere of these influences, or would a change be beneficial?”

**Personal factors:** Human beings possess the innate desire to adapt to and master their environment as part of their search for self-fulfilment [44]. A wide variety of

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**Figure 1:** Daily Function Homeostasis (Day-Fun-Home).
personal factors may come into play in this context, including age, gender, nationality, religion, marital status, years of education, strengths, skills and abilities as well as personal values, interests, beliefs and roles. Although a person’s roles involve various commitments and obligations, they also serve as opportunities for personal growth and development (e.g., [45]). Personal factors such as one’s values, interests and beliefs, strengths and weaknesses can increase the significance and meaningfulness of one’s preferred activities and thus contribute to life satisfaction [46].

A wider perspective of a person’s strengths and abilities can be garnered by considering the premises introduced in the theory of multiple intelligences where each person possesses one or more of the following types of intelligence: logical-mathematical, linguistic, spatial, musical, bodily-kinesthetic, personal and intrapersonal intelligence [47]. Thus, in considering personal factors, reflection on which of the above mentioned types of intelligences typify a persons preferred activities, life choices (i.e., family status, home life, job, leisure pursuits, educational and social status) and lifestyle could be helpful. Reflective questions that may be posed include: “Does my self-perception represent an accurate appraisal of my abilities and weaknesses?”; “Do I make optimal use of my strengths during daily functioning?”. Once a person becomes aware of these factors and their significance, strategies can be discussed that may facilitate a transformative process, which in turn can promote self-actualization meaning becoming the person one has the potential and the desire to be [48,49].

For example, the current pace of life often creates stress thus the ability to organize and manage one’s time is crucial in adapting to daily demands. Difficulties in this area may negatively impacts life satisfaction and meaningfulness in life [50,51]. Accordingly, identifying this problem and using suitable strategies to improve one’s ability to organize daily life tasks can be instrumental in improving daily function homeostasis and well-being.

**Life events:** People are not always aware of the potential influence of events they experience in their day-to-day functioning. Life experiences shape a person’s history and personal narrative [39]. These experiences include major life events such as unemployment, divorce or death of a relative (e.g., [52]), and those related to the nature of the family with whom formative years were spent: “Was my family nurturing, encouraging and wholesome, dysfunction-

A number of studies have emphasized the importance of the relationship between past experiences, their emotional context and their impact on future actions [54], as people create themselves through memory [55]. Thus, when memories of life events trigger sadness and self-doubt, people often get trapped and negative self-esteem may be related to their sensibility and inability to receive bad feedback [56-58].

Contrarily, positive thinking can broaden persons thinking, fuel psychological resilience, build one’s personal resources and seed human flourishing [59]. Also, King, et al. [46] suggest that people can incorporate positive daily life experiences within their personal meaning systems. The author’s clinical experiences indicated that such negative or positive feelings play a role in the individual’s starting point towards certain daily tasks. Therefore, the Primary Emotional Response (PER) needs to be considered as it influences the individual’s internal resources towards performance.

In order to learn more about the issues underlying the person’s daily life pursuits and behaviors, the following questions may be posed: “What are my memories that have contributed to making me who I am today?”; “What did I learn from these experiences?”; “How do these experiences reflect on what is important to me?”; “How have these experiences affected my job, career, or activity choices?”. Reflective questions such as these can facilitate the person’s awareness of whether certain activities result in feelings of pleasure or self-efficacy; or whether experiences of failure or disappointment have influenced the manner in which decisions regarding occupation, career, actions or lack of action are made. Developing awareness of one’s primary emotional responses to specific daily activities linked to past experiences that limited growth can enhance perceived self-efficacy and motivate the person to move forward [24,60].

**Health, disease and disability:** Traumatic injury, disease and disability and the resulting effects significantly impact a person’s overall life experience. The extent of these effects on social relationships and the achievement of life goals vary in the nature, severity and course of the disease or injury and of their dysfunctional manifestations [61]. However, mostly, the onset of disease and trauma results in changes to familiar daily life routines and to the person’s and the family’s functional performance. For example, as children with chronic developmental disabilities transition into adolescence, they often experience growing isolation as a result of intrinsic and extrinsic factors that limit their integration into their school community [62]. Moreover, such feelings may lead children with disabilities to develop
a passive life style and low levels of participation. Therefore, it is important to go beyond medical diagnoses and clinical assessments when analyzing the person’s daily life performance. Focus on how the person and his or her family experience illness and how they have incorporated living with a disability into their daily lifestyles is vital [63]. For example, how can a person with muscular sclerosis be active and continue to participate in social frameworks despite the mobility and fatigue limitations?

Thus, the current framework (Figure 1) focuses on the repercussions of these phenomena, and how they impact activities, participation, and daily function as defined by the ICF [12]. The Day-Fun-Home concepts may increase a person’s awareness of the multifaceted consequences of their disease or impairment and stimulate decision making processes [36] and problem-solving strategies to improve their quality of life.

After gaining profound understanding of the five components that respond to the question of who the person is, the framework continues to explore activities and participation characteristics (Figure 1).

**Activities and participation:** Bishop Robert South wrote that “action is the highest perfection and drawing forth of the utmost power, vigor, and activity of man’s nature” [64].

Human occupation is comprised of aggregated sequences of actions and activities. Most people perform the same basic activities, but the occupations that they desire to do define who they are and make them unique [65,66 p.865]. Occupation is defined as “the principal means through which people develop and express their personal identities” [67 p. 547] while engagement in occupation helps bring meaning and coherence into our lives (e.g., [65,66]. Eakman [6] commented that the subjective quality of experience or meaning associated with engagement in activity may be a key mechanism through which day-to-day action influences personal well-being, such as meaning in life [49,68]. Moreover, occupational dysfunction has been found related to both social participation and to decline in health-related quality of life [69]. However, the question of how to practically ‘apply’ occupation to improve life satisfaction and well-being prevails. The following sections focus on a discussion of the factors that characterize occupation, and clarify their contribution to daily function, activities and participation.

**What?:** People perform endless activities throughout their lives. The activities a person chooses to do on a daily, weekly, monthly or yearly basis influence his or her well-being. Activities can be categorized as Activities of Daily Living (ADL), Instrumental Activities of Daily Living (IADL), work, education, leisure, social participation and rest/sleep [70]. Learn about the person’s daily routines and rituals helps understand “what” a person does on a daily basis, for example what activities are performed related to work, study, child-care, sports, social/leisure activities?. To generate self-awareness, people should consider what activities they currently do or do not and what they have or have not previously done throughout their lives, such as, “What do I enjoy doing most?”; “What must I do, and what do I do because I want to?”; “What activities are pleasurable and satisfying?”; and “What do I wish to do but have not done due to lack of time, sometimes even over a span of years?”

**Where?:** The concept of “where” complements the environmental factors previously described (Figure 1). It focuses on the context of where activities and occupations are performed. Where relates to the individual’s position within space and to the movement through it, through engagement in activities or occupations [71]. As previously said, environment is a significant factor in a person’s life path. The Day-Fun-Home describes the influence of the ‘space and place’ as modified by a person’s actions. The concept of ‘space and place’ includes aspects that are concrete (where things are done, objects locations; [72]) or abstract, static or dynamic. For example, the person’s sense of being in place is a complex and dynamic life phenomenon [73,74].

From a broader perspective, space and place refers to the nature of a person’s life environments. Specifically, “Are they arranged suitably to simplify their daily activity performance (e.g., in the kitchen, bedroom, supermarket, office or gym)?” “Do they reside in a place where they can enjoy privacy or is their living space always shared with others?”

At a more abstract level, the significance of a person’s personal spaces and places in life can be a fruitful line of inquiry [41]. Reflection upon this aspect of ‘where’ can be stimulated by questioning the nature of one’s spaces and places. For example, “Is my space defined by me or by others?”; “Does the space in which I live limit or challenge me, or am I a prisoner in my own space?”; “To what extent do I act within the settings in which I function to accommodate my changing needs and facilitate a sense of self-agency and meaning in life?”; “Where do I feel I best actuate my abilities and desires at home, work, and during social and leisure pursuits?” Rowles [41], noted that ‘the experience of being in the here and now, our being in place, is a product of where we have been and where we are going’ (p. 129). The dimensions of ‘where’ comprise aspects of the person’s past, present and future, all of which should be considered in contemplating how to best achieve a more balanced life.

**When?:** Our lives are organized both temporally and spatially. Time monitoring is basic to human functioning, while the time-space prism impacts on where, when and what occupations we can do [75-77]. Time is the organizational frame for life and we depend upon times and places to allow us to “be” and “do” our selfhood through our occupations [67,76,78].

Time use is a concept that refers to how people allocate their time in pursuing tasks or life goals throughout
their day, week, month, or even years [67]. To stimulate reflection, one may ask “How much time do I spend doing weekly chores, with my children? How much time do I spend with my spouse?” Further, in terms of wellbeing, “How much time is invested in things that I must do compared to things that I wish to do?” People living in westernized cultures must adapt to an ever-increasing pace of life and feel the need to do more than the existing 24 hours allow. Consequently, consideration of time in prioritizing goals is critical to self-regulation.

Time orchestration or time balance refers to how much time a person invests in work, family, leisure, personal development and sleep. When examining the use of time, one should consider the balance between one’s various occupations; does the person find satisfaction in how their life is orchestrated? Finding balance is critical in light of studies that indicate a relationship between the temporal aspects of daily function and human psychology and physiology (e.g., [26,35]).

Thus, the analysis of a person’s temporal organization of his/her activities and routines can reveal important insights as to the quality of his/her daily functional homeostasis.

**Why?** The question of how relates to the amount of energy or effort people need to invest in the tasks they perform. Daily tasks can be categorized into those performed automatically, and those that require cognitive or intentional resources and effort. The energy resources invested in daily activities vary between persons. These resources depend on factors ranging from previous experiences and skills, to individual factors (i.e., sensory-motor, cognitive, meta-cognitive, inter-personal and emotional social capabilities), as well as environmental considerations (see “environmental press” above). This aspect is particularly relevant for a person coping with a developmental delay or disease as they are faced with varied physical/sensory/cognitive deficits (e.g., Multiple Sclerosis [79]). Furthermore, emotional factors can also influence the effort needed to perform various tasks. In fact, at any phase of life people must choose where, when, and for what their energies should be directed to achieve homeostasis.

**Why?** Why refers to the purpose and significance of a given human activity. The performance of meaningful activities is recognized as an essential aspect of psychological wellbeing that has significant implications for mental and physical health [80]. Meaningful activity has been defined as a subjective experience composed of a range of unique, discernable qualities [81,82]. There is ongoing interplay between meaningful activities and meaning in life [81]; and meaning in life has been identified as a critical outcome of a person’s engagement in activities [65].

Given the impact of achieving meaning in life to people’s overall satisfaction and well-being, it is vital to consider why persons invest in specific activities and occupations. For example, “why do I choose a particular profession?”; “Why do I invest more time working at the cost of spending quality time with my family?”; or “why do I avoid modifying my lifestyle (e.g., physical activities, healthy eating, sleep habits, alcohol consumption) when it poses a risk to my health?” (e.g., [83]). Contemplation of such essential matters through reflecting on the ‘whys’ of one’s life may stimulate a person to alter its course and provide the potential to improve his/her daily functional homeostasis.

The combined understanding achieved as a result of extensively analysing the previous constructs lead to exploration of the life goals (Figure 1).

**Life Goals**

Human beings generally organize their days around doing and achieving small milestones or goal-directed activities they feel the need to accomplish, described by Little [84] as ‘personal projects’. Alternatively, Daly [85] used the term ‘daily travel’ to refer to activities that mediate “between the needs of the person, both internal and social, and the sources of their satisfaction, which are distributed in space” [86]. The personal goals people set provide insight into their motivation and resources as well as the meaning and coherence of their lives [87]. The amount of time a person allocates to projects viewed as personally important was found to correlate to satisfaction in life [88]. Furthermore, retrospective research among older adults indicated that daily and long term life goals constitute an important component of autobiographical memory and reflect personal meaning and identity (e.g., [89-91]).

In fact, research has supported the relationship between goal-related events and people’s moods (e.g., [92]). Daily frustrations related to the inability to accomplish life demands through daily occupation, may lead to feelings of failure and depression in later life (e.g., [93]). Flexibility and the ability to abandon goals that are no longer appropriate and shift one’s focus to new goals that lead the person to experience fulfillment is the hallmark of successful self-regulation [87].

Hence, in the search to improve satisfaction and well-being, it is useful to pause and reflect on one’s ‘daily travel’ and contemplate whether one’s goals are those that will prove meaningful and fulfilling.

**Harmony, Conflicts and Gaps**

Studies have indicated significant relationships between the inability to implement one’s inner strengths, ambitions, (actuate ‘the real me, see [94], and physiological manifestations such as illness [95].

The Day-Fun-Home (Figure 1) concepts may lead to the understanding of whether the individual’s daily functioning is harmonious or whether there are conflicts or gaps that may be addressed. This process of understanding leads outward to the premises that encircle the framework that enables identification of the person’s strengths and weaknesses. From these understandings, appropriate assess-
ment and intervention processes can be developed that aim to promote daily functioning that will lead the person to a sense of control, self-fulfillment, life satisfaction and well-being (Figure 1). The process is illustrated by the following case description.

G. is a 48-year-old man who lives in a small rural town. He has lived near his parents since his divorce. He works as an engineer in a nearby town, 5 km away. Although his home is close to his work place (where), it takes him an extensive amount of time to get to work every morning (time). He works at a job that he inherited from his father (personal factors, life events, primary emotional responses). However, in fact, he has long found this job to be unchallenging (how). Therefore, he could benefit by asking himself why he continues doing it and whether his current occupation will satisfy his life goals.

He has always loved to draw (strength) but has not had the time to invest in this activity. Nevertheless, he finds himself creating new ideas in his work place and enjoys this process. Hence, there are creative aspects to his personality that are not sufficiently expressed in his daily life.

The analysis of G’s current status with the guidance of an occupational therapist can help him understand his cognitive, metacognitive, sensory motor and socio-emotional strengths and weaknesses towards the development of improved daily functioning. When prompted with relevant questions G’s awareness as to the harmony or discord of his daily functioning can be augmented. If conflicts or gaps prevent him from achieving his goals, professional help can be sought to help develop strategies, adaptations and compensations to promote improved function. For example, inadequacies in a G’s meta-cognitive abilities may result in his experiencing deficits in temporal or spatial organization. Strategies for improving the planning and organization of G’s daily and weekly activities could lead him to modify his schedule and enable him to participate in more creative activities, thus providing him with greater feelings of self-fulfilment. In doing so, he may enjoy a more positive emotional state, enhance his productivity at work, and experience more harmonious family interactions.

Understanding the conflicts and problems that challenge one’s well-being and finding appropriate resolutions may decrease the energy needed to perform daily life activities and routines. This process of self-investigation may lead the person to increased feelings of control and self-efficacy, and reinforce the attainment of a higher level of daily functional homeostasis.

Conclusions

The Day-Fun-Home framework (Figure 1) was constructed to provide a holistic guided approach to day-to-day functioning and cultivate subjective well-being. The broad range of issues involved in examining and analyzing human functional homeostasis go well beyond those considered in the purview of human physiology.

This framework may be applied to an isolated task, a specific day, a specific period of time or to one’s entire life. A dynamic interaction exists between daily experiences, internal regulation and how the person reacts and performs. Dis-regulation leads to dis-homeostasis.

By enhancing one’s self-awareness in this manner, a person can build upon his/her inner personal resources with or without guidance, and develop strategies to generate a process of self-actualization, thereby improving one’s overall wellbeing.

As human beings possess a strong desire to understand themselves and the world around them [96], supplying them with the tools and information they need to achieve mindful awareness of their experiences may lead persons to undertake a plan of action to achieve a more balanced and meaningful engagement in the dance of life (e.g., [97-99]).

References


