

Eudaimonia in Human Factors Research and Practice

Foundations and Conceptual Framework Applied to Older Adult Populations

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Abstract: Well-being/quality of life has emerged as a strand of inquiry in human factors research that has expanded the field's reach to matters beyond fit, functionality and usability. This effort has been spearheaded by "hedonomics," a human factors conceptualization of well-being that reflects the philosophical notion of hedonia, traditionally defined as pleasure. However, recent work in the psychology of well-being has shown that hedonia constitutes only one facet of well-being. In light of this, the concept of "eudaimonics" as a complement to hedonomics is introduced. First, these concepts are positioned relative to their counterparts in philosophy: where hedonomics is characterized by pleasure and avoidance of pain (hedonia), eudaimonics is characterized by flourishing and personal excellence (eudaimonia). Following this, a working conceptual framework for eudaimonics that is informed by the psychological literature is presented. An expansion of the hedonomics model of design priority hierarchy is offered. Applications to the domains of ageing well and technologies for older populations are proposed. Directions for future work, including the adoption and modification of psychology instruments for human factors research, is discussed.

1 INTRODUCTION

Human factors/ergonomics (HF/E; hereafter "human factors"), a multidisciplinary domain of research and practice that looks at the fit between people and systems, is typically concerned with three main issues: safety, productivity, and prevention of error (Meister 1999; Vicente 2004). However, a growing number of researchers and practitioners have begun to consider other factors that affect fit, including satisfaction and motivation for life activities and the impact those activities have on overall well-being.

A relatively new domain of inquiry called "hedonomics," which takes its name from the Greek root of "hedonia," has attempted to tackle the intersection of well-being, people and systems. Hedonomics is explicitly concerned with positive and pleasurable interactions between people and systems (Hancock et al., 2005; Helander and Tham, 2003). However, a review of the philosophical foundations and recent work on psychological constructs of well-being show that hedonomics is limited by its focus. This combined with recent insights on the need for a well-rounded perspective of well-being, e.g. for older adults and mobility

(Nordbakke and Schwanen, 2014), argue for an expanded view of well-being in human factors that addresses well-being factors that are conceptually outside the purview of hedonomics.

In this paper, "eudaimonics" is introduced as a complementary concept to hedonomics and potential area of research and practice that is (a) proposed by the philosophical underpinnings of well-being, and (b) supported by established psychological work on well-being. A preliminary conceptual framework for eudaimonics as well as an expansion of the hedonomics model of design priority is proposed. The main contribution of this paper is therefore an informed expansion of well-being in human factors from philosophical and psychological perspectives, particularly with respect to the ageing process.

2 CONCEPTUAL OVERVIEW

In the last century, interest in well-being has taken root within many disciplines, including health, gerontology, philosophy, and psychology. A wealth of terms and definitions abounds within and among these domains. In psychology, for instance, well-

being has been defined as (a) “optimal psychological experience and functioning” (Deci and Ryan, 2008, p.1), (b) happiness, positive affect, and lack of negative affect (Bradburn, 1969), and (c) life satisfaction (Ryff, 1989), among many others. To compare with a perspective from another domain: the World Health Organization defines well-being as “individuals’ perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns” (World Health Organization, 1997, p.1). Likewise, the constructs that make up conceptualizations of well-being and the measures used to assess well-being are equally varied.

This diversity of domains and definitions provide several valid options on which to base a conceptual understanding of well-being in human factors. Given the ties human factors has to psychology and the effort undertaken by psychologists to achieve a coherent, rich, measurable conceptualization of well-being, as well as overlap between the psychological literature and conceptualizations of hedonomics, we have chosen to focus on the psychological literature.

2.1 Philosophical Foundations

Well-being can be traced to Hellenic philosophy on what constitutes “the good life” (Ryan and Deci, 2001; Keyes et al., 2002; Ryff, 1989). Disagreements among philosophers gave rise to two perspectives on well-being: the Aristippian “hedonia” as the pursuit of pleasure; and the Aristotelian “eudaimonia” as the pursuit of excellence (Deci and Ryan, 2008; Ryan and Deci, 2001). Recently, an alternative to the Aristippian view has been proposed: “hedonic utility,” a view based on the utilitarian philosophy of 18th century philosopher Jeremy Bentham (Sirgy, 2012; Graham, 2012, p.33). Regardless, the essence of each position is that eudaimonia focuses on virtue and hedonia focuses on pleasure.

2.2 Psychological Foundations

As in the time of the early Greek philosophers, debate about what well-being is—how it should be defined, what it constitutes, how it can be measured, and what to call it—continues. A perusal through the literature will reveal several terms that are sometimes used to refer to the same or different constructs. For example, in his recent text on the psychology of well-being, Sirgy (2012) argues for three constructs of well-being: “hedonic well-being”

(which constitutes happiness and affect, components that others, have attributed to subjective well-being), “life satisfaction” (which others consider to be a component of subjective well-being, or SWB), and “eudaimonia” (which encompasses psychological well-being, or PWB, and flourishing), while also sometimes using “subjective well-being” to refer to all aspects of well-being. In contrast, Waterman et al., (2010) argue that “hedonic well-being” can be used to refer to SWB, where both refer to the same concept. Here, we will review the literature and endeavour towards a consensus in terminology and concepts using the latest empirical research on how well-being constructs can be distinguished.

2.2.1 Subjective Well-being and Hedonia

Subjective well-being (SWB) has a lengthy history within psychology. It is important to note that while some (e.g. Sirgy) may use the term to refer to well-being as a whole from a psychological perspective, and it can be confused as a reference to subjective approaches to assessing well-being, SWB is a standalone concept with empirical backing.

Historically, SWB has been defined as an individual’s subjective level of happiness, comprised of and measured through three components: positive affect, a lack of negative affect, and life satisfaction (Diener et al., 1999; Diener, 1984). Notably, researchers in this area commonly use the term “happiness” to refer to SWB (Deci and Ryan, 2008).

A new view of SWB has been developing within the past two decades: Kahneman, Diener and Schwartz’s (1999) conceptualization of SWB as a hedonic construct. In this view, SWB as “happiness” is analogous to presence of pleasure and absence of suffering. However, a hedonic view of SWB creates a problem for the inclusion of life satisfaction as a component of well-being, because life satisfaction involves conscious appraisal of one’s position in life, a process that falls under the purview of eudaimonia (Deci and Ryan, 2008). In sections 2.2.3 and 2.2.4, we discuss how this problem may be resolved through a unified model of well-being based on recent empirical work.

2.2.2 Psychological Well-being and Eudaimonia

Research on psychological well-being (PWB) has only gained steam in the last two decades (Deci and Ryan, 2008). It is important to note that the term does not merely refer to well-being from a psychological perspective, and could instead be better understood as “cognitive” well-being, where

knowledge of one's well-being requires cognition: self-awareness and conscious thought processes about the self and one's impact on the self and the world. Additionally, PWB (as a psychological construct) has been earlier and more explicitly tied to eudaimonia (as its philosophical foundation) in the literature than SWB to hedonia; further, some have argued that PWB and eudaimonia should not be conflated. We will attempt to reconcile these differing outlooks while working towards a unified view of this aspect of well-being.

Waterman (1993) introduced the notion of eudaimonia as an essential quality of well-being. Drawing from early philosophy, Waterman proposed that eudaimonia is self-realization: a process of fulfilment characterized by personal expressiveness (PE) as one moves closer to one's true self, or "daimon." A truly eudaimonic process meets six criteria: deep understanding, unusually good fit with the activity, feeling alive, feeling fulfilled, feeling that the activity is "meant to be done," and feeling that one is truly being oneself (Waterman, 1990). Waterman makes explicit ties to intrinsic motivation (Deci, 1971), flow theory (Csikszentmihalyi, 1991), and self-actualization (Maslow, 1962).

Ryff (1989) introduced the concept of psychological well-being (PWB) as a multi-dimensional construct distinct from SWB. She developed and then validated with colleagues (Ryff and Keyes, 1995) six dimensions of PWB: autonomy (personal will to action), environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance. More recently, Ryff and Singer (2008) performed a close reading of Aristotle's eudaimonia (from *Nicomachean Ethics*) and discussed how it relates (and does not) to PWB. Even so, there is some contention among scholars, particularly Waterman (2008), regarding the validity of using PWB alone to characterize eudaimonia.

In their review, Deci and Ryan (2008) posit two central differences between Ryff and Waterman's conceptions of eudaimonic well-being (EWB): one, that Ryff's PWB is about an individual's global well-being, whereas Waterman's PE is specific to an activity; and two, that Ryff's PWB is content-specific, e.g. the environment, relationships, etc., whereas Waterman's PE is content-free.

More recently, Ryan and Deci (2001) have argued that their self-determination theory (SDT) underpins and gives rise to eudaimonia. SDT (Ryan and Deci, 2000) comprises three basic psychological needs: autonomy (also an aspect of Ryff's PWB), relatedness (again, an aspect of Ryff's PWB), and

competence. They posit a number of differences between SDT and PWB. For instance, SDT nurtures EWB while PWB describes it. Further, SDT is thought to nurture both SWB and EWB.

2.2.3 Life Satisfaction

Recent large sample studies that employed factor analysis have shown that hedonia and eudaimonia are related but distinct concepts (Proctor et al., 2014; Huta and Ryan, 2010). However, the results of these studies also suggest that life satisfaction, generally considered a component of SWB (Linley et al., 2009), is a distinct concept that may be determined or mediated by hedonic and eudaimonic well-being together. This provides some empirical support for the notion that SWB cannot be considered entirely hedonic; however, whether this is due to the cognition involved in assessing one's own life satisfaction or some other reasons(s) is unknown.

2.2.4 Synthesis

The above overview presents an emerging picture of how psychological conceptualizations of well-being and philosophical standpoints on well-being can mesh. Psychological research involving large sample studies using factor analysis have shown that SWB and PWB are distinct but related concepts (Linley et al., 2009; Keyes et al., 2002). From a philosophical standpoint, researchers tend to align SWB with hedonia and PWB with eudaimonia (Waterman et al., 2010), although some contention remains (Deci and Ryan, 2008; Ryan and Deci, 2001) and conceptual relatedness, if not overlap, almost certainly exists. In any case, a growing area of empirical work points to the need for a well-rounded view of well-being that incorporates hedonic and eudaimonic qualities (Huta, 2013; Nordbakke and Schwanen, 2014).

A working model that synthesizes our conceptual overview can be found in Figure 1. We use this model to express a conceptual understanding of hedonomics that is based on relevant, established philosophical and psychological concepts, and further propose a complementary domain that we are calling "eudaimonics."

2.3 Hedonomics

Hedonomics as an area of research and practice was first proposed by Helander and Tham (2003) in light of increasing interest within human factors on the topic of affect, and in particular pleasure, as opposed to pain, which has generally been associated with the

established topic of safety. Helander and Tham make reference to Kahneman’s work on hedonic well-being as a founding theory, while also drawing on several relevant trajectories within human factors, namely: Kansei (feeling) engineering (Nagamachi, 1995), affective computing (Picard, 1995), pleasurable product design (Jordan, 1998), and Donald Norman’s insights on pleasure in design (Norman, 2002), which has recently culminated into a new area called positive computing (Calvo and Peters, 2014). However, perhaps because of the nature of the paper as an editorial, the authors do not suggest a particular theory or provide a theoretical framework for the concept of hedonomics; rather, they offer it as a new area of research and practice.

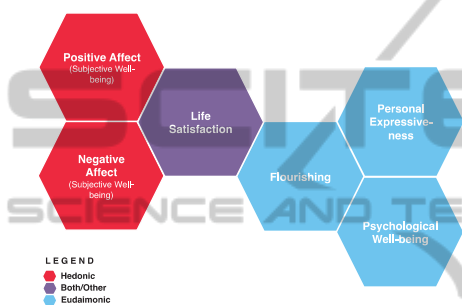


Figure 1: Conceptual overview of well-being.

Hancock (who coined the term “hedonomics” and is cited by Helander and Tham as the inspiration for bringing attention to this topic), Pepe and Murphy (2005) offer a deeper take on the theory and conceptual foundations of hedonomics. Here, the focus of hedonomics is explicitly positioned opposite to ergonomics: where ergonomics focuses on the prevention or alleviation of pain, hedonomics focuses on providing or increasing pleasure. Hence, “additive” (rather than subtractive) human factors. Further, hedonomics is contrasted with human-centred design, which the authors argue takes a general stance to design (e.g. designing for the capacities of people in general, or centaurs in general, to use their example), rather than focusing on an individual and their personal needs. Thus, human-centred design must be extended to include “individuation,” or individual-centred design.

2.3.1 Theoretical Model

The structure of the hedonomics model is based on Maslow’s (1970) hierarchy of needs, where lower-level needs must be met before high-level needs can be achieved. In the hedonomics model, the first three needs are the domain of traditional human factors: safety, functionality, and usability. The final two

needs are the domain of hedonomics: pleasurable experience (hedonia) and individuation (defined by the authors as “personal perfection”). An exception is made for usability, which the authors consider a cross-domain factor. In the hierarchy, the needs closest to the bottom are more relevant to a general (or “collective”) approach to design, while the needs closest to the top are more relevant to an individuation approach to design.

To the authors, pleasurable experience may be generated by designers’ use of “hedonomic affordances,” which attempt to elicit specific affective states in the end-user. This idea reflects psychological conceptualizations of SWB, which is the domain of hedonia, thus complementing the psychological work on well-being. Individuation may be attained by developing smart tools that allow end-users to customize their experience, perhaps by responding to their affective needs.

2.3.2 Critique

A review of the model combined with a close examination of how hedonomics is described by the authors in-text and with respect to the psychological literature reveals some discrepancies. As expected given the term’s inspiration (hedonia), the authors define hedonomics as the promotion of pleasure. However, they also at times characterize its scope as eudaimonic. For instance: “To fulfil the needs of the user, we need to incorporate an explicit recognition of motivation, quality of life, enjoyment, and pleasure into design recommendations” (Hancock et al., 2005, p.11). Further, they argue that the concept of individuation, which in the model is separate from the need for a pleasurable experience, fulfils the need for autonomy, a eudaimonic construct. Finally, they refer to Peterson and Seligman’s (2004) work on the nature of virtue (philosophically the domain of eudaimonia). This reference provides motivation for the adoption of well-being into the domain of human factors but also serves to highlight a gap in the model: explicit inclusion of eudaimonic factors.

These issues raise two harmonizing possibilities for expansion of the model: (1) clarification of the definition and scope of hedonomics, and (2) introduction of a eudaimonic aspect to the model. To this end, we propose an expanded human factors model of well-being that explicitly addresses the concept of a eudaimonics of human factors.

3 CONCEPTUAL FRAMEWORK

The philosophical and psychological underpinnings of well-being advocate at least two perspectives: a hedonia of human factors—the already established hedonomics—which is concerned with positive and negative affect (and especially pleasure), but also a eudaimonia of human factors—we propose “eudaimonics”—which addresses flourishing as personal expressiveness and self-realization. In Figure 2, we offer an expanded version of Hancock and colleagues’ hierarchy of hedonomic needs as a general model of well-being in human factors that includes a eudaimonic perspective.

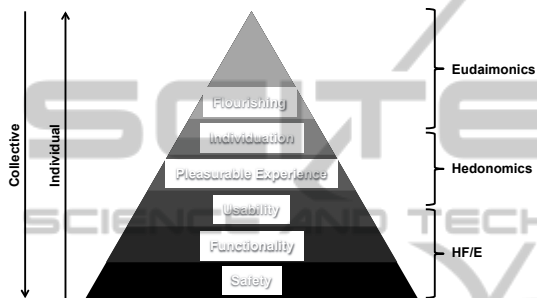


Figure 2: A human factors model of well-being that includes a eudaimonic aspect. Based on the hierarchy of hedonomic needs by Hancock, Pepe and Murphy (2005), which was based on Maslow’s (1970) hierarchy of needs.

Here, eudaimonics shares the need for individuation with hedonomics (as per the idea that individuation elicits autonomy, a eudaimonic construct). The new need that represents the eudaimonic aspect of well-being—flourishing—is a catch-all term derived from the psychological literature on eudaimonic well-being. Its position at the top of the hierarchy is based on the philosophical and psychological justifications of how hedonia and eudaimonia are positioned with respect to each other as well as the original model’s use of a scale of global-individual appropriateness.

3.1 Application to Ageing Well

If we assume that optimal well-being is a common goal of all adults regardless of age, then systems, technologies, and devices must be designed with all elements of the model in mind. When these systems are designed to replace or augment changing human functions, such as mobility, sensory and cognitive functions, it is insufficient to only consider human factors and hedonomic elements. Further, the context in which these systems are used may have a

direct impact on an individual’s sense of self and ability to flourish, particularly as the individual faces new challenges due to changes in their health and well-being status as they age. Finally, efforts are required to determine how the design of assistive technologies and systems can positively affect a person’s transitioning state of well-being and sense of self resulting from the aging process.

Going forward, measures of well-being that include hedonic and eudaimonic factors must be adapted or devised so that they are actionable by and fathomable to designers and users, similar to how usability measures (Rogers et al., 2011) have been developed. For instance, Huta and Ryan’s (2010) Hedonic and Eudaimonic Motives for Activities (HEMA) instrument may be used to assess human-system interactions for specific contexts, tasks and activities, but this needs to be tested in human factors work. Further, eudaimonic well-being design guidelines similar to the safety, functionality and usability triad that can be found in textbooks and standards, e.g. the ISO/TC 159 Ergonomics standard, are required. This will involve empirical human factors studies in which eudaimonia, as well as hedonia and other aspects of well-being (e.g. life satisfaction), are assessed.

4 CONCLUSIONS

An initiative towards establishing well-being as an important factor in the fit between humans and systems is underway. To this end, we have identified eudaimonics as a potential domain that complements the established area of hedonomics. We have developed a conceptual framework that distinguishes the two and is informed by relevant philosophical and psychosocial concepts. We have discussed how this framework may be used to understand the ageing process and the affect on ageing people. We can suggest several trajectories for future work:

- Adapting existing, validated psychological instruments for use in human factors research.
- Development of design guidelines for eudaimonic systems.
- Validation and expansion of the model: While founded on sound theoretical work that has empirical backing in psychology, the model needs to be validated with respect to human factors knowledge.

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