Measuring Product Happiness

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Abstract
The broadening of scope from usability to user experience we have witnessed in the CHI community represents a shift to a more holistic appreciation of how objects and technology can be purposeful to the people that use them. A recent extension of this development is to also pay attention to the question how technology affects the subjective wellbeing or happiness of users. This work in progress paper describes a theoretical model of product attribute categories relevant for product happiness and the development of a scale that aims at measuring the happiness impact of products based on this model. First, the hypothesized model is presented that proposes three different types of product qualities: pragmatic, hedonic and eudaimonic. Second, the development process of a happiness scale is explained. Finally an overview of the future steps is given.

Author Keywords
Product assessment; subjective wellbeing; happiness; product scale; eudaimonic attributes

Introduction
The broadening of scope from usability to user experience we have witnessed in the CHI community for the last several years represents a shift to a more holistic appreciation of how objects and technology can be purposeful to the people that use them. A recent extension of this development is to also pay attention

to the long-term affective impact of technology – to the question how technology affects the subjective wellbeing or happiness of users. This development aligns with the maturing of the domain of 'positive psychology,' which studies the conditions for and measurement of subjective wellbeing. This field has developed several scales to measure wellbeing, models that explain the determinants and manifestations of wellbeing, and interventions to increase wellbeing. Happiness research is not only mushrooming in psychology but also in other disciplines like marketing, economics, and politics. In general we seem to move from solving problems and avoiding or eliminating negative emotions towards creating possibilities and looking for positive experiences to make life of individuals in specific and the world in general better. Examining the history of design research this trend is evident as well; first the focus was very pragmatic on functionality (does the product work?) and ergonomics (can people use the product?) then usability (can people understand the product?) received attention followed by user friendliness (do people like the product, is the interaction pleasurable?) and currently the role of products in human flourishing is emerging (e.g. [1], [2], [3], [4]). Based on and inspired by theories from positive psychology design researchers are creating methods, tools and theories for the development of products contributing to or even being a cause of human flourishing. Recent examples of these studies and products are still scarce, but available. Ruitenbergs [5] Tiny Tasks is an example of a product that targets at changing behaviour. Key chains containing specific assignments based on the subjective wellbeing strategies of Lyubomirsky [6] trigger users to carry out those activities. Users can confirm assignments at their profile page and reflect on their experiences. Pohlmeyer [4] created an overview of possibilities for design strategies represented in a happiness matrix based on the PERMA theory of Seligman [7], [8]. Ozkaramanli & Desmet [9] explore how conflicts can inspire design for wellbeing and Desmet [10] identified four basic opportunities for happiness-driven design to offer structure and inspire designers and researchers who want to work on products contributing to human flourishing. Not only the question of *how to design* products contributing to the wellbeing of users is interesting for the design field, but also *the assessment of* these products is necessary to understand the concept of subjective wellbeing in relation to products. The goal of this research is to develop a tool for assessing the contribution of products to wellbeing. In this article the theory and the hypothesised model on which the tool is based, is explained and the first step into the validation process is described.

Theory of product attribute categories

Happiness

Huta & Ryan [11] studied the hedonic and eudaimonic pursuits and showed that hedonia is related to purely affective outcomes, immediate outcomes and becoming disengaged from concerns. Whereas eudaimonic pursuits relate to cognitive-affective feelings of significance and appreciation, longer-term outcomes, becoming more engaged and feeling connected with a broader whole. Eudaimonic activities are not necessarily pleasurable and often do not have an immediate effect on happiness. For an individual to flourish a balance between hedonic and eudaimonic pursuits should be reached and maintained. A purely hedonic life is pleasurable but lacks depth and meaningfulness, a purely eudaimonic life is meaningful,

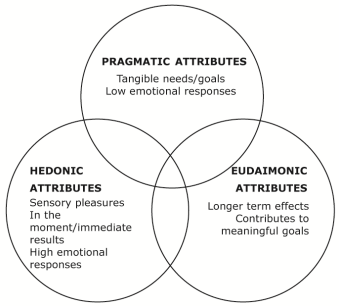

Figure 1. Hypothesized model of product-attribute-categories relevant for products contributing to human flourishing.

but without pleasure and fun hard to live. Therefore happiness refers in this article to hedonic aspects (pleasure) as well as eudaimonic ones (meaningful).

Measuring happiness

So far, several studies report of questionnaires containing measures on objective variables that influence well-being like money and place of residence. However these variables are not major determinants of happiness, according to Luybomirsky [6] only 10% of our overall happiness is influenced by external circumstances. Subjective assessment methods are therefore more suited for our purpose. Measuring subjective wellbeing is done in single scale measurements aiming at global happiness evaluations like Cantril's ladder [12] as used by the Gallup World Poll (GWP). Others use multiple items like the Affect Balance Scale [13], the Oxford Happiness Questionnaire [14], the psychological WellBeing scale [15] and the Satisfaction with Life Scale [16]. Lyubomirsky & Lepper [17] argue that most scales measure either affective or cognitive aspects of wellbeing and they developed a scale to measure "...subjective happiness – that is, a global, subjective assessment of whether one is a happy or an unhappy person...". In the before mentioned scales happiness is not measured in relation to the stimulus but to an individual evaluation of (a part of) one's life. Contrary, in our research we look at the stimulus (an object) and we want to assess its impact on the user's life. Therefore existing scales cannot be used one-to-one in our study.

A model of product happiness attributes

In order to develop a product happiness scale an understanding of how a product can contribute to a user's happiness is needed. We suggest that products enhancing user happiness, have pleasurable qualities (level of hedonics) and meaningful aspects (level of eudaimonics). Fun and pleasurable products are described by (design) researchers such as Carroll & Thomas [18], Jordan [19], Hassenzahl et al. [20], Hassenzahl [21] and Hancock et al.[22]. Carroll & Thomas already pleaded for fun products in 1988 and pointed out that designers should not assume that easy to use is the same as fun to use. Jordan gives an holistic framework of the pleasurable aspects of products. Hassenzahl et al. [20] and Hassenzahl [21] showed that users can distinguish between pragmatic and hedonic attributes of a product. Which was also recognized by Hancock et al. who introduced the term "hedonomics" which consists of individuation and pleasurable experiences as opposed to ergonomics. We propose a third category of product attributes for products contributing to human flourishing: eudaimonic attributes. In Figure 1 an overview of the categorization is presented. In the following, we will describe the different main categories and illustrate the description with product examples. Please note the examples are only included for illustration purposes because the context, and individual differences (cultural background, concerns, experience) make it impossible to assign individual objects to categories. The model presents three overlapping main attribute categories of products:

- Pragmatic attributes (PA): an object with mainly PAs fulfils immediately a tangible goal, without eliciting a high emotional experience nor providing an engaging activity like a pair of scissors (Figure 2).

- Hedonic attributes (HA): an object with mainly HAs fulfils immediately an intangible need and/or

provides an activity disengaging from concerns that elicits a high emotional experience like a vase you find aesthetically pleasing (Figure 2).

- Eudaimonic attributes (EA): an object with mainly EAs contributes to a meaningful goal and offers or represents an engaging activity like a Madonna or wedding rings (Figure 2).

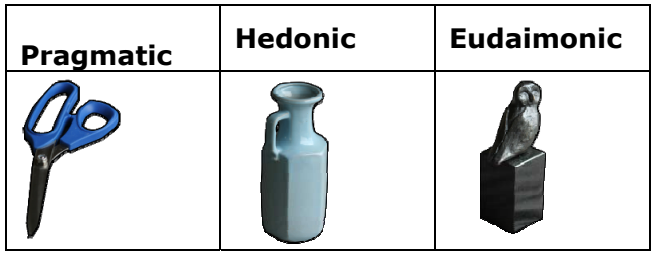

Figure 2. Product examples containing mostly pragmatic (left), hedonic (middle) and eudaimonic (right) attributes.

DIFFERENCES BETWEEN ATTRIBUTE CATEGORIES

Pragmatic attributes and hedonic ones have a more immediate result than eudaimonic attributes. Pragmatic attributes often have a low emotional response and hedonic attributes often evokes high emotional responses. Furthermore, eudaimonic attributes are characterized by an engaging activity whereas hedonic attributes trigger more disengaging activities. Finally pragmatic attributes fulfil a tangible need like opening a can whereas products with eudaimonic attributes and hedonic attributes fulfil a more intangible need like feeling autonomous.

OVERLAPPING CATEGORIES

As shown in the model, all three categories overlap each other. The subcategories are described in more detail using examples for every category (Figure 3):

Figure 3. Product examples; a product containing PA and HA (top left); a product with PA and MA (top right); a product example with HA and EA (bottom left); product with PA, HA and EA (bottom right).

NOTE these product examples are only included for illustrative purposes because the context and individual differences makes it impossible to assign individual objects to the categories.

- PA & HA – Alessi tea strainer; this object combines a pragmatic function (PA) with a modern design that some people can find aesthetically pleasing (HA).
- PA & EA – Container for organic waste; this product stores organic waste (PA) to facilitate recycling and to enable people to live sustainably (EA).
- HA & EA – Facebook/Twitter; it does not directly fulfil a tangible need, however, people like to know what their friends are doing and share their experiences (HA), someone who uses Facebook might think it quicker and feel more connected to them (EA).
- PA, HA & EA – Compact photo camera; this object combines all three attributes, it takes digital photos (PA), it can suit your identity because of its sophisticated and minimal design (HA) and you can document an important (social) event in order to provide you with a tangible meaningful memory (EA).

Development of initial list of items

The hypothesised model was starting point for the happiness factor questionnaire. Based on the three main attribute categories (pragmatic, hedonic and eudaimonic) a list of questions was composed. Hassenzahls description [21, 20] of ergonomic (EQ) and hedonic qualities (HQ), inspired the pragmatic and hedonic questions. He indicates that "EQ... addresses the underlying human need for security and control" and "HQ…refers to quality dimensions with no obvious…relation to task-related goals such as originality, innovativeness..". For the eudaimonic attribute category no existing assessment tool for products was found. After a literature analysis searching for affective and cognitive elements that influence wellbeing the theory of Ryff [15] was selected for several reasons: (1) she already created a questionnaire to measure these different elements in

Since I own this product:
• I am a more giving and empathic person • I feel I make more often a contribution to the world • aspects of myself that I like are more emphasized • I have a better sense of what I am trying to accomplish in my life • I more often set and pursue meaningful goals • my daily activities seem less trivial and more important
This products helps me to:
• develop and grow as a person over time • accept myself completely; my good as well as my bad qualities • rely on myself and evaluate my actions by what I think is important, not by what others think is important

Table 1. Examples of Eudaimonic statements used in the product happiness assessment questionnaire.

individuals, (2) there is convincing evidence for validity of this questionnaire and the elements are (3) distinct and (4) on the same level. The existing questionnaire developed by Ryff for measuring six dimensions of wellbeing was translated by four experts individually into a questionnaire for products. In an expert discussion a final list was created. After a pilot study with 12 participants the final questionnaire contained 36 items; four general questions, four statements measuring pragmatic qualities, four for hedonic and 22 eudaimonic. Because the eudaimonic aspect is the most novel for product design, examples of these statements are listed in Table 1.

Next steps and current limitations

Although, validating a scale is a time consuming and long process [e.g. 23], we believe that a happiness questionnaire will aid the CHI community and product designers in assessing their products and services for their impact on users' wellbeing. In order to reach the ultimate goal of a validated happiness scale, many steps still have to be taken such as an explorative factor analysis, scale refinement studies, confirmatory factor analysis, scale validation studies and experimental validation. Next to the obvious necessity of further scale validation there are some limitations which need to be considered as well:

- The translation of the English questionnaire for psychological wellbeing into our scale for meaningful attributes in products was done by not native English speakers; this could have caused errors in the translation. Furthermore most participants were not native English speakers. It is possible that some items were misinterpreted and therefore some ratings were imprecise.
- We stimulated the selection of random products by asking participants to select a product they used last weekend. However, it is possible that the majority selected a product which was functional because of the term "used". Furthermore, meaningful products may also have symbolic meaning for users and are therefore not "used". Consider for example a wedding ring; this is probably not an item that was selected because it is not common to "use" it. Therefore the meaningful products might have been more absent from the selection than pragmatic and hedonic ones.
- The dynamic product experiences and how product relationships change over time are also highly relevant factors in meaningful products (eudaimonics is characterized by its longer term character) which are currently not included. This needs to be studied in the future as well.

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