

# HCI for Positive Change

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## ABSTRACT

This paper aims to outline some of the key challenges towards a HCI for positive change. Drawing on previous empirical studies concerning the development of positive expressive technologies for social wellness, this paper is a delineation of some of the key challenges in terms of theoretical underpinnings, design and evaluation of technologies that aim to contribute to happy beings in everyday life.

## Keywords

Change, positive psychology, lightweight interaction, happiness, everyday life, positive messaging

## INTRODUCTION

Since the inception of the field of Human-Computer Interaction (HCI) much progress has been made on improving the usability of technology and (increasing) its functionality. In doing so, the field has played a key role in the massive proliferation and adoption of technology within the general public. The infiltration of technology has shaped and changed many aspects of people's everyday lives, such as the way people communicate, socially interact, find information and perform their work. The way technology changes people's lives however, does not always positively contribute to people's social wellbeing. For example, cyber bullying over instant messaging or email is becoming increasingly commonplace [12]. Bluetooth jacking, the practice of sending unsolicited messages to discoverable phones in range, or bluesnarfing, the theft of data from a discoverable phone, is another illustration of communication mechanisms that are often perceived as intrusive, malicious or unwanted [23]. And thus, technology does not always provoke a positive change. On the other hand, particularly growing subfields such as affective computing [17], social computing and UX (user experience) design have shown that technology can emotionally connect and delight people [e.g. 7, 22]. If, according to Aristotle, the highest and most important goal for human beings is happiness [1], then the ultimate goal of technology could be seen as facilitating people's experience of positive affect. This does not simply imply the design of a fun technology or pleasant-to-use product, but a refocusing on understanding how technology can be designed for people to experience positive affect in their

everyday lives.

Naturally, most practitioners in the field of HCI aim to give the user a high-quality experience with technology, but designing technology that actually contributes to people's happiness in their everyday lives is a more complex challenge. There is clearly an opportunity to employ technology for positive change, but how this can be achieved is more difficult to determine. This paper aims to contribute to the understanding of people's positive affect that technology could support by discussing the theoretical underpinnings, technological design considerations and evaluation techniques that could help to address the question of how technology could possibly contribute to people's happiness.

## THEORETICAL UNDERPINNINGS

### Positive Psychology

Traditionally, the field of HCI, cognitive ergonomics and psychology often focus on negative emotional aspects, such as dealing with frustration. However, the lack of user's negative feelings is not the same as generating the presence of happy or emotionally positive feelings. In the field of HCI, the nearest commonly used measure to this is the notion of user satisfaction [16, 19] Yet, satisfaction is generally considered to be related to "freedom from discomfort" [6] or the enjoyment or usability of a system, matching this to a user's goals. Certainly, a satisfied user may indirectly become happier, but this affect is only elicited and measured by reference to the way that their tasks are carried out. Clearly, technology offers the potential for more than this task-oriented perspective on a user's positivity. More essentially, technology could contribute to people's happiness, but how?

Positive psychology, the study of human happiness [20], arose from the need to add a positive side to the predominantly negative discipline of psychology — negative, in terms of its focus on mental *illness*, rather than *wellness*. Research in the field of positive psychology has added to an increasing empirical understanding of happiness and the value of positive emotions. Studies have for example shown that positive affect plays an important role in improving people's performance, satisfying relationships and better health [14]. This field has also successfully tested happiness increasing interventions [21]. Whilst psychology has grappled with these issues, so far, this refocusing towards the role and value of positive affect does not appear to have filtered deeply into the theory and practice of technology design. This is perhaps surprising, given that HCI has a tradition of drawing from other disciplines,

such as cognitive psychology for a better understanding of users' perception and problem solving abilities. To better understand how technology can make a positive change, and could be possibly designed for increasing people's happiness, this paper calls for a closer relationship between HCI and positive psychology to develop further understanding of how people's happiness could be possibly improved, with (or without) technology.

### DESIGN OF POSITIVE TECHNOLOGY

Knowledge of positive psychology studies needs to be applied to the design of technology to prove truly useful. The PosiPost project is an example of such approach. Building on positive psychology studies that have demonstrated the social and health benefits of positive disclosure [21], *PosiPost Me* (Mobile internet edition) and *Be* (Bluetooth edition) are applications developed for the recording and sharing of positive emotions over distance (*Me*) and with people in proximity (*Be*). Users are asked to complete the sentence "Today, I like" to encourage positive postings which are then distributed to other PosiPost users. PosiPost *Me* runs on a Smart phone and is an application that uses a 3g connection for the random global distribution of positive thoughts. The Bluetooth version of PosiPost allows the sharing of positive thoughts with people in proximity. As such, these positive expressive applications empower the user to become aware of positive moments in everyday life, and enable investigation of the kind of pleasures people enjoy [11]. The social, sharing nature of the technology was considered important as psychology studies have shown the important role social interaction plays in experiencing happiness [14]. The ability to record the shared pleasures with the PosiPost technology enabled the investigation of what people enjoy in everyday life. Analyses of the messages uncovered the particular mundane nature of the shared pleasures [11].

Although the concept of Flow [4] has relatively been given a lot of attention in the HCI-community as being the only key concept from positive psychology that has truly filtered in HCI theories and practices, the content analysis also uncovered that particularly other pleasures than those derived from active flow calls, deserve further attention and discussion in HCI [11]

### Lightweight technology

The massive proliferation of technology and increasing adoption and use of on-line and social applications does not necessarily make people happy. Complex 'wow' features of technology do not always fit comfortably in people's busy daily (social) lives. For example, the growing phenomena of social network fatigue [5] illustrate that technology can sometimes require considerable input and place an unwanted load on users. Although complexity does not necessarily equate to unhappiness, there might be a need for more lightweight applications, that do not add to the stresses and demands in everyday life. The PosiPost applications are examples of lightweight technology, as these are running on top of mundane, mobile technology, and aimed to be simple, non-invasive interventions to record and share positive thoughts and pleasant experiences [11]. Studies with

PosiPost showed that users particularly liked the simplicity of the applications [10] and thus demonstrate a challenge for technology developers in moving away from 'bloated' [15], heavyweight technology and deciding when less is more.

### Flexibility

Just only a few years ago, the control of the creation of the contents lay mostly with the designer. In the case of CD-ROMs for example, the contents created were mostly fixed and the navigational paths were set beforehand. The rise of the Internet, and development of creative tools that can be used by a wide public, now empower users to easily create and modify their own contents. This enables technology to function in a changing context and this adaptation helps in a constant changing world. As in many ways users have taken over the role of designer and developers as creators of contents, the original developer has less control, leaving more risk for possible negative or offensive contents. Naturally, technology can be used for positive as well as negative change, but studies with PosiPost [9] have shown that the 'traditional developer' can still design technology in a way that directs users to create contents that are predominantly positive. In the PosiPost project for example, the prefix "Today, I like" was used, because (from the ones studied) it was tested as the most effective prefix to encourage the expression of *positive* thoughts [9]. Yet, by simply finishing the prefix "Today I like" with the mobile PosiPost applications, users are still able to flexibly create rich contents themselves and thus change the nature of their user experience.

### EVALUATION

To determine whether technology actually instigates a positive change, it needs to be evaluated. So far, such evaluation methods for technology have been left behind in comparison to the creation of the plethora of technological applications. Questionnaire instruments from (positive) psychology and affective research are useful when wanting to evaluate people's mood and happiness. However, most of these methods still need further maturing in terms of reliability and validity testing, and have not been particularly designed for testing the effects of using a technology.

The SPOT instrument was developed for the PosiPost applications to enable the measurement of the Social and Positive Psychological effects of the Technology in more quantifiable detail. Thus, the focus of this questionnaire is specifically on the social and affective changes that (positive expressive) technology may foster. It is based on positive psychology measuring instruments and HCI-questionnaires that aim to measure social and emotional constructs (e.g. [8, 18]). The general shortage of valid and reliable measures for technology-mediated social and emotional affects could be partly due to difficulties in grasping and capturing social concepts. Concepts such as social wellbeing and happiness are difficult to define, as these are often multi-dimensional, open to different interpretations, and thus hard to measure.

Lawshe's method [13] was used to assess the content validity of SPOT questionnaire's proposed constructs and its items. This method is essentially used for gauging

agreement among experts regarding how essential a particular item is. This meant that the questionnaire was sent to a panel of experts, who were asked to indicate for each item whether it was 'Essential', 'Useful, but not essential', or 'Not necessary' to measure the underlying construct. For example, for the Happy item, all experts rated it as essential for measuring the construct wellbeing. And the statement "PosiPost increased my positive thoughts" was rated as an essential item for measuring the construct *positive thinking*. The questionnaire items that did not meet the minimum desired CVR (content validity ratio) values were omitted, so that a questionnaire with satisfactory valid constructs remained. This enabled an agreement on the representation of its concepts and so to help remedy limitations in past attempts for measures.

Although the SPOT instrument could become a useful addition to the currently limited spectrum of reliable and valid instruments for measuring the social and affective impacts of technology, it should certainly not be regarded as the last word on the subject as further validation and iteration should be promoted. As the focus on the positive end of the spectrum of HCI and psychology increases, understanding of key concepts will grow and develop, and hopefully better valid and reliable measures will be developed.

The SPOT questionnaire was given before and after using each PosiPost version to evaluate if there was an actual (positive) change in people's emotional and social state. This was considered as a valuable approach as generally without such pre-test, once a technology has been introduced, it is very difficult to determine how people were feeling before, and thus how or whether the technology actually made a positive change.

Although rigorous pre- and post testing for significant variance is widely adopted in many scientific fields, it might be considered as less common practice in HCI [2]. In medical science, for example, before a medicine is introduced, the effects of using the invention are normally intensively studied in clinical trials, before being considered safe and widely released to the public. Such approaches, as often taking years, might be considered a bit extreme for the case of technological innovations, for which ethnographic studies in the field [e.g.[3]] could also be considered as valuable. However, conducting more rigorous pre- and post studies of using technology (long-term) would help in better determining the effects after using a technology in more quantifiable detail and thus aid in determining whether an introduced technology will actually make a positive change. Using such approaches may also help in building better bridges between HCI and other disciplines, such as positive psychology, for which such empirical methods have been already more tightly integrated in its practice.

## CONCLUSION

This paper outlined some of the challenges towards a HCI for positive change. In particular, the key challenges are seen as these:

- Building a bridge between HCI and positive psychology for a better understanding of how technologies (could) contribute to people's happiness;
- Building technologies, such as positive expressive, flexible and lightweight ones, which promote positive affect in everyday life and do not add to people's daily stress and social demands;
- Improvement of evaluation methods that can capture positive changes with technology.
- Clearly, much work still needs to be done in understanding technology-mediated happiness, but hopefully, these considerations may prove a useful step towards designing for positive change.

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