The Potential of Technology in Facilitating Positive Stress Experiences

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ABSTRACT
The positive side of stress, eustress, has remained an under-studied area in psychology, health technology and HCI. Based on 21 qualitative interviews with entrepreneurs on their positive stress experiences, we aim at providing implications for technology-supported service design. First, we shed light on the current role of technology in experiencing positive stress in the everyday work-related situations of entrepreneurs. Second, the potential of technology is assessed by analysing entrepreneurs' mind-sets and the ways of working which they perceive as enablers for eustress and which could be facilitated by novel technological solutions. Our findings show that the potential of technology for supporting eustress includes areas such as co-creation and collaboration, planning and scheduling, togetherness and shared success, the means for mental preparing and ways to recover.

Author Keywords
Positive stress, eustress, potential of technology, entrepreneurs, digital services, human-driven design

ACM Classification Keywords
H.5.m. Information interfaces and presentation (e.g. HCI): Miscellaneous.

INTRODUCTION
Recent scientific papers focusing on stress management and technological solutions typically start with impressive figures demonstrating health problems and cost estimations related to stress [e.g. 18,17,7,1]. Considering this widely agreed impact of stress on workplaces and society, ensuring rich and multidisciplinary research of this phenomenon is important.

Our aim is to contribute to HCI, cognitive ergonomics and stress management research by focusing on the positive side of stress, eustress, which has clearly received less attention in the scholarly literature than negative stress, distress. Even though the beneficial side of stress has been recognised a few decades ago [20,28,29], the research has concentrated on the negative aspects of stress, and only few studies have been conducted or theories constructed focusing on or including eustress. The emphasis of this research has been on conceptual papers, and empirical papers have concentrated on limited contexts so far (e.g. hospital nurses and ministers of religion). Several authors have concluded calling for further research and a clearer elaboration of eustress, especially in work life settings. [30,14,10].

We aim at increasing understanding of the phenomenon of positive stress by studying work-related eustress experiences of entrepreneurs. In this study, the term entrepreneur refers to small business owners or self-employed workers. Although entrepreneurs represent different domains and are far from a homogeneous group, high stress levels, unique sources of occupational stress and also positive effects of positive stress have been been identified among them [see an overview in 11]. Compared to employees, entrepreneurs have more freedom in deciding their working time and ways of working. Thus, they probably have more opportunities to influence eustress experiences as well. However, this freedom also creates a need for balancing one's time to achieve the intended results efficiently.

This research is a part of a larger project on eustress, which aims at increasing personal and workplace well-being, innovativeness and ways of finding new resources for daily work. In addition, we aim at contributing to the field of HCI and cognitive ergonomics by studying the use and potential of technology from a new perspective, eustress, which we believe to be beneficial and worth aspiring to.

In this paper, we aim to shed light on the understudied area of eustress and especially the connection between eustress and technology, which has not been covered in the existing studies. Our research questions are:

1) What is the current role of technology in experiencing positive stress in the everyday work-related situations of entrepreneurs?
2) What is the potential of technology in facilitating positive stress experiences?

The structure of the paper is as follows: First, we introduce the concept of eustress and the idea of savouring eustress. Second, we present research findings on the effectiveness of web-based and mobile health interventions, and third, examples of mobile applications related to stress management. After introducing our research approach and method, we present our findings. The first part of the findings responds to research question 1, and the second part widens the focus to research question 2. Finally, we present our conclusions and suggest directions for future research.

RELATED WORK

Concept of Eustress

The term eustress was first introduced by Hans Selye [28], who divided the concept of stress into distress and eustress, based on the initiator of stress – either negative stressors or positive emotions. Later [29], he emphasised the different reactions to stress: "it is not only what happens to you, but how you react to it". Selye suggested that one can learn to react to stressors with positive emotions (e.g. gratitude, hope or good will), which is likely to maximize eustress and minimize distress. Already before Selye, the positive side of stress was explored from a more cognitive perspective by Richard Lazarus [20]. He suggested that the cognitive response to stress experience can also be a positive one, leading to a feeling of fulfilment or other positive feelings. Lazarus and Folkman [21] emphasised that the individual's resources and ability to cope define the stress experience. Cox et al. [5] have clarified further the role and significance of individual differences in psychological processes when coping with stress.

Based on the work of Lazarus and Selye, the current understanding of eustress emphasises the individual interpretation of stressors. The stressor type itself does not lead to eustress or distress, but the person may perceive the stressor as a negative threat or a positive challenge [9]. According to Simmons and Nelson [30], eustress and distress are seen as distinct qualitative constructs, not the two ends of the same continuum. The responses to stressors can be either positive or negative, and they can take the form of psychological states and emotions, attitudes and behaviours.

Interestingly, Simmons and Nelson do not only focus on coping with distress, but emphasise the meaning of savouring eustress. Savouring the positive literally means enjoying it with anticipation or dwelling on it with satisfaction or delight [24]. Hargrove et al. [13] propose three means for leaders to encourage eustress in their employees. They can help employees to savour eustress by offering them meaningful work, encouraging mindfulness at the workplace and supporting employees in understanding their capacity to meet challenge stressors. Also, the match between a person's skills and the demands of the task is seen as critical.

Even though eustress may lead to many positive outcomes, an individual's inability to cope or excess of eustress can lead to exhaustion [5,13]. It is important to recoup and recover also from positive stress. Adequate daily recovery is essential for staying healthy and energetic both at work and during leisure time [6]. For example, mindfulness and self-regulation skills can support a detachment from work stressors and a focus on leisure time activities [31].

Efficacy of Web-based and Mobile Stress Management Interventions

The actions, techniques and interventions for managing stress, or positive stress, for example in work life settings, are affected by both the characteristics of the stressors (e.g. amount, timing, source, control) and by individual' interpretations of them [10]. Occupational stress management training sessions are traditionally guided by an instructor and taught face-to-face to a group of people. However, the search for more cost-effective and non-stigmatizing, easy access mental health interventions has increased the interest in web and mobile health interventions.

In work life stress management context, the evidence in web-based interventions is promising, but not yet comprehensive [17,16]. The few studies already studying the potential of web-based stress management interventions [16,8, 2,4,12,15] have given varying results. Some studies have reported positive results in web-based stress management intervention compared to a control group [2,15] or compared to conventional care alone [12]. On the other hand, Eisen et al. reported that in their trial, computer-based relaxation techniques led to significant reductions in immediately-reported stress, but the effect was lower than in in-person format and the training session suffered from a higher attrition rate [8]. Also, another randomized controlled trial finds out that a web-based programme was no more effective than print material in reducing stress, although it worked better in e.g. dietary changes [4].

Ly et al. evaluated the efficacy of a smartphone-administered stress management intervention based on acceptance and commitment therapy [18]. Their application had similarities with the idea of positive stress: it contained, for example, modules and practices for recognizing stressful thoughts that do not necessarily reflect reality. The intervention tested had a moderate effect on stress in a randomized controlled trial and the authors conclude that the results are promising.

Also, an ongoing study by Heber et al. shows promising results in perceived stress levels with web-based stress management with responsive web design usable also by mobile devices [17,16]. This training puts emphasis on emotion regulation, and because of that, resonates at least on some level with the concept of positive stress.

While few studies exist already about stress management interventions facilitated with technology, no studies so far, at least to our knowledge, have examined the potential of technology in facilitating positive stress experiences in particular. However, despite some challenges and the small number of scientific studies, the effectiveness of technolo-

gy-aided stress management interventions is promising. Naturally, the benefits and efficacy depend heavily on the design of mobile and web-based solutions.

Examples of Mobile Experiments and Applications Supporting Stress Management

Based on existing research on health interventions and design experiments, it seems that stimulating positive stress, as well as reducing negative stress, can be supported by digital services or applications. Promising results have been achieved for example in piloting the Oiva application [1] and Mood Map application [23]. Both applications focus on reducing stress, but base themselves on cognitive processes which could support experiencing eustress as well. Using wearable sensors and utilising physiological data are other interesting design directions applied e.g. by Sanches et al. [27] and MacLean et al. [22]. Still another design direction is applied by Paredes et al., who have experimented with repurposing popular web applications as stress management interventions [26]. The following sections summarize the findings and conclusions related to these experiments.

The Oiva application was developed for prevention and management of work-related stress, and its usage, impact and user experiences were studied in a one-month field study with fifteen office workers [1]. The application is based on acceptance and commitment therapy methods, and includes 45 exercises divided into four themes (Mindfulness, Healthy Mind, Values and Actions, Healthy Body). The pilot study showed active use and good acceptance of the application and positive effects on well-being. The authors conclude that engaging mobile applications may provide benefits for personal mental well-being.

The Mood Map application was developed for increasing self-awareness and supporting coping with stress, and it was tested in a one-month field study with eight participants who had reported significant stress [23]. Participants were prompted to report their moods several times a day using a two dimensional scale (valence-arousal) and single-dimensional scales of anger, anxiety, happiness and sadness. Despite the limitations related to the small sample size and the fact that users did not use their own mobile phone, the study showed promising signals of increased emotional awareness and self-regulation. The authors even conclude that mobile applications hold promise for delivering state-of-the-art psychotherapies in a non-stigmatizing way to people who would not otherwise have access to therapy.

Sanches et al. designed a biofeedback mobile service for everyday stress management, and iteratively tested different visual user interfaces by using the system themselves [27]. Through their experiments and exploration, they learned that the design should allow room for users' own interpretations and reflections on the physiological stress reactions instead of trying to offer a ready-made diagnosis of stress.

MacLean et al. tested their design MoodWings: a wearable butterfly that mirrors a user's real-time stress through wing motion [22]. MoodWings was tested in a simulated driving environment to discover whether the participants using it were more aware of their stress and consequently, were able drive more safely. The results showed that the solution increased their awareness of stress and performance, but interestingly, it also acted as a stressor itself, regardless of whether it mirrored low or high arousal. In general, the users were enthusiastic about the potential of the system, but it caused stressful distraction in the driving context.

Paredes et al. experimented with a rather different approach to stress management, which they call crowd therapy [26]. Through a mobile application, they explored whether popular web applications could work as stress management interventions. The idea was that different individuals could benefit from different applications based on their personalities and current needs. Based on experiments with 20 participants, the approach could be beneficial, as it increased self-awareness of stress and provided new, simple ways to deal with stress. However, in a similar way as with the MoodWings experiment [22], one third of the users perceived using the application itself as a source of stress.

Kaipainen has studied the real-world use of health-promoting online and mobile applications, and discovered that the applications can contribute to improved well-being and behavioural changes as long as they are simple, attractive and easy to integrate into everyday life. Applications should be designed to support small concrete actions with immediate benefits, encourage self-reflection and provide guidance while maintaining freedom of choice. [19]

According to prior studies and experiments, relieving stress via technology can be based on several, rather versatile, factors. Technology can increase an awareness of stress (also too much!), trigger stress-relieving exercises and enhance self-regulation skills. Although prior experiments have not focused particularly on eustress, the results of the studies also provide useful insights for other kinds of well-being solutions, including the facilitation of eustress.

RESEARCH APPROACH AND METHOD

Research Approach

This research is the first part of a human-driven design process, in which the design starts from the field and everyday life of people without any technology, devices or services to be tested [25]. Our research approach is selected to provide new and relevant knowledge of the research subject, but also to increase the participants' awareness and engagement related to the themes of the study. To ensure versatile perspectives on the subject, we have adopted a multidisciplinary approach, combining an understanding of user experience, social sciences, business and technology.

Participants

The 21 interviewees were all Finnish entrepreneurs, 11 males and 10 females. Their age range was from 30 to 52, the majority being in their thirties or forties. Most of them

had a small company with fewer than 10 employees. The entrepreneurs represented different fields: ten of them worked in education or consulting and eleven in other fields, such as the building industry and software design. The sample included relatively new entrepreneurs – twelve of them had worked as an entrepreneur for less than five years. Many had worked as an employee before, and indicated that becoming an entrepreneur was a part of a bigger life change for them. Almost all of the interviewees were from the Tampere area, but the sample also included two entrepreneurs from the capital area of Finland.

Entrepreneurs were invited to participate in the study through different channels, such as entrepreneur email lists, and thus the participation was voluntary and mainly based on one's interest in the research area.

Method
This research was carried out by conducting 21 semi-structured entrepreneur interviews focusing on the participants' personal experiences of positive stress. The 2-hour face-to-face interviews were conducted at the entrepreneur's workplace or another quiet place. Although working context offers valuable insights of the working environment, conducting the interviews without disturbance at a location convenient for interviewees was prioritized. The interviews were carried out by two researchers.

Due to the exploratory nature of our research, the interviews consisted of broad and open themes around every day experiences, not focusing only on the use of technology as such. The aim was that participants had an opportunity to bring up aspects that are meaningful to them and the role and potential of technology would emerge from these descriptions. The interviews proceeded in three phases. First, the participants were asked to walk through their personal history as an entrepreneur and describe their daily life. Second, participants retraced at least one experience of positive stress and elaborated their emotions, behaviour and attitudes related to this experience and the factors they see as relevant for achieving such experiences. Third, just in the last part of the interview, questions explicitly explored the role of technology in these experiences.

The transcripted interview data was thematically analysed. The coding followed the steps defined by Braun and Clarke [3] and the analysis proceeded as follows:

1. **Familiarization with data.** The transcribed data was first read through as a whole. The main content of each interview was discussed in the multidisciplinary research team to build mutual understanding of the data to form a basis for analysis.

2. **Generating initial codes.** All data was then systematically coded. Initial coding was data-driven, analysed without a preformulated framework from the literature. In the first phase, all the data, including comments or experiences related to technology use, was coded.

3. **Searching for themes among codes.** Codes related to technology were next sorted into two themes: current technology use supporting eustress experiences and current technology use hindering eustress experiences. Inside these themes, the quotations were thematically grouped according to their affinity.

4. **Reviewing themes.** The closer review of the themes revealed that the coding covered well the current role of technology in eustress experiences, but did not sufficiently reflect the potential of technology. For this reason, all the data was coded again in order to identify the current ways of working which facilitate eustress and have the potential to be aided by technology. The data-driven analysis led into 5 sub-themes describing the potential uses of technology in facilitating eustress: co-creation and collaboration, planning and scheduling, togetherness and shared success, means for mental preparing and ways to recover.

5. **Defining and naming themes, and producing the final report.** Finally, all themes were written down with descriptions. Quotations were chosen to illustrate entrepreneurs' experiences and the current or potential role of technology.

FINDINGS
Among the interviewed entrepreneurs, positive stress was perceived to be an unfamiliar term, but the phenomenon was recognised by everyone. They all recalled situations in which eustress played an important role, such as giving a presentation, leading an important workshop or writing a critical document under time pressure. Some even thought that eustress is the reason for being an entrepreneur, leading one to enjoy the work and the work to feel rewarding. Most of the entrepreneurs did not mention technology when they were asked to recall a recent eustress experience. Through a more thorough elaboration, however, technology was identified to be one of the barriers or enablers for experiencing eustress, similarly to the working environment, social interaction and the content of one's work.

In the next sections, we first describe the current role of technology in the everyday working contexts of entrepreneurs. Second, we present themes which were perceived by the entrepreneurs as being important for experiencing eustress, and through them, discuss the potential role of technology in facilitating eustress experiences.

Role of Technology in Experiencing Positive Stress
Among the entrepreneurs interviewed, the role of technology evoked both positive and negative comments and experiences. The positive aspects are presented first.

Technology as a Facilitator for Positive Stress Experiences
Technology was seen to create or enhance a feeling of control through reachability, joint scheduling and communication tools – also when working remotely. Communication

tools that support instant, positive, dynamic and dialogic discussion around work tasks were seen as useful and motivating – enabling a shared understanding of the challenges and progress of the ongoing work. At its best, technology may facilitate eustress by conveying a feeling of presence or supporting the impression of working in the same space even though the participants were in different locations.

"When I have coached managers, it [well-designed video conferencing system] has been great, totally amazing. The table in Helsinki looks exactly the same as the table here; it looks through the screen as though we were around the same table. I couldn't believe that those people are in Helsinki (laughs), not here in Tampere." Female, 49.

Technological tools help in building and maintaining a contact network, following or sharing work-related news, receiving feedback or recognition and digitally demonstrating or distributing one's work. The entrepreneurs interviewed felt that all these aspects may lead to the feeling of eustress – by making it easier to be in contact with relevant partners, to stay updated, inspired and tuned in to news and have a digital channel for sharing one's efforts and success. Although digital sharing does not directly guarantee recognition of one's work, it increases the opportunities for receiving feedback and making new connections.

"If someone does something to my posting, like shares it or likes it, it always feels rewarding. If you share a blog post and share it and someone likes it, it doesn't mean that other people see it or consume it, but you get it out into the world" Male, 31.

Technology as an Obstacle to Experiencing Eustress
Besides the positive aspects of technology use, technology was also seen as an obstacle to experiencing eustress. Non-functioning, slow or too complicated technology was seen to hinder the experience of eustress or cause frustration increasing distress. If technology does not work properly, it distracts one's concentration from the main tasks, and if it is perceived too complicated, it requires learning, which is often felt to be time-consuming or unappealing in general.

"I'm totally hopeless with technology, I hate gadgets. I couldn't bother less; I never read manuals. Then I wonder why they don't work. When I have my summer holiday, I always plan that I would study the use of something. As if I will. And I hate it, because if I would, it would all be easier." Female, 52.

In addition to more functional problems, some entrepreneurs were also anxious about the increasing role and number of technological tools and channels, which may lead to excessive refinement of one's work or extend one's work to leisure time. It is easy to stay connected to work also in one's free time, which brings both benefits and harm. When the work is always within reach, recovery and relaxation requires more effort and determination.

"It is difficult to switch off; you are connected to the work all the time. You should detach at least for a moment, do something else. It's unfortunate that I'm quite a slave to my phone and tablet and laptop." Male, 40.

The endless amount of information, news and opportunities may also create a feeling of inadequacy.

"You notice that there is so much going on in the world, that you feel inadequate. There is always someone who tweets and someone who has done something and who publishes something. It's endless. If you try to keep up, it makes you stressed – negatively, not positively." Female, 39

To summarize, the perceived role of current technology use is twofold, facilitating eustress by enhancing the flexibility and fluency of working, but also preventing eustress by poor functionality or excessive and exhausting pervasiveness, which blurs the borders between work and leisure time – impeding detachment from work. Current technology use patterns and the attitudes towards using it show that technology may be a channel for facilitating eustress, but currently the impact is often the opposite.

The findings suggest that eustress could be supported both by the appropriate design of technological tools in general and by offering novel tools for facilitating experiences, mind-sets or ways of working which may lead to eustress. The following section concentrates on these aspects.

Potential of Technology in Facilitating Positive Stress
When describing their eustress experiences, the entrepreneurs seldom mentioned technology as a part of these. However, technology may serve as an enabler to create an appropriate mindset or ways of working which lead to eustress. In the sections following, the future potential of technology is assessed through the themes which rise from the interviews: co-creation and collaboration, planning and scheduling, togetherness and shared success, the means for mental preparation and ways to recover.

Co-creation and Collaboration
According to the entrepreneur interviews, the experience of eustress is often generated through collaboration and co-creation between colleagues, partners or customers. For example, an active workshop or a demanding negotiation is a typical situation involving eustress due to meaningful objectives of a meeting or the insecurity of the course of it – embedded in the nature of social activities. In these kinds of working contexts, technology was perceived to be a potential means for enhancing presence between participants and for providing the concrete tools for collaboration.

Technology was seen as potential in enhancing focusing on a shared goal, providing the tools for testing or demonstrating ideas and helping instant or automatic recording of results. It was seen as an important facilitator for remote working – to enable seeing and hearing others, co-creating a shared document, and in general, to replicate a feeling of working together. The potential was also seen in sharing relevant information – instead of detached bits and pieces.

"I see email, Facebook, Twitter, LinkedIn and such as separate tools, used unconnected from the really meaningful stuff. Technology should support presenting the staff with the relevant things,

that make people committed and help create states of excitement together." Male, 41.

Planning and Scheduling

The occurrence of eustress was seen to require achievable but tight enough scheduling, ways to monitor progress and triggering oneself to complete relevant tasks. To facilitate planning and scheduling, the entrepreneurs had their personal means to list and prioritize tasks, schedule their own and joint activities and chop their tasks into smaller parts. Especially chopping the tasks seemed to be an effective means of generating eustress, as it does not only increase one's feeling of control, but also gives a feeling of small success any time a task is accomplished and can be crossed off from the list. Breaking one's tasks into smaller pieces is one way to make planned or completed work visible – an ambiguous objective can be changed to concrete actions, such as emails, phone calls, meetings and documents.

"You need to see the overall picture and break it up into smaller pieces…. I may have twenty emails and three to react, which takes half an hour. I list it down, and it makes me feel effective when I can cross it off." Female, 38.

In scheduling, eustress was facilitated by deadlines and reserving enough time for non-work activities. Some entrepreneurs also consciously planned peaks to their schedule to enable periods of eustress and recovery after them.

"I have made a sort of rhythm for my work. There are peaks with lots of travelling, which I can do three or four times a year…. At peaks, I feel really effective, and by all means, then I enjoy the most." Male, 52.

In many situations, non-digital tools, such as post-it-notes and manual calendars, were preferred, due to their concreteness. Digital tools for planning and scheduling should aim at supporting similar instantness to help e.g. in chopping up tasks. Still, tangibility and the possibility to make digital into non-digital are important aims to make digital tools more versatile, more easily adopted and suitable to be used in hands-on work.

Togetherness and Shared Success

Entrepreneurs highlighted the importance of acknowledging the achieved results, good progress and positive feedback inside the team as one building block of positive stress. It is also important for entrepreneurs without a team, but sharing success brings it to a new level. It gives new energy to the whole team and makes everyone's efforts feel worthwhile. In addition to recognising the achievements, recognising the unrewarding but necessary work behind it may be even more appreciated within the team, make everyone strive for the same goals and raise the spirits among co-workers.

"I launched a sort of shovel prize … Most of us don't really do anything with the shovel as we live in the city centre, but the thing is that you can have it besides your desk. Everyone knows that the one who has the shovel has done something really unrewarding, which has brought money and got things going on, but definitely hasn't been enjoyable." Female, 39.

Recognising others' achievements and successful collaboration is not only important when celebrating it, but these shared experiences may help in achieving a can-do attitude in other challenging situations. Thus, the role of technology in eustress could lie in sharing, but also in reminding the team to recall the feelings of good moments.

Means for Mental Preparing

To facilitate eustress, one of the most central factors is to achieve the correct kind of mindset to respond to new challenges. Depending on the situation, it may happen through reassuring and relaxation, but also through recapturing a good, energetic mood. Many of the entrepreneurs mentally walked through an upcoming demanding situation beforehand, imagined difficult steps and some even went through the worst scenario – to make the actual situation feel much easier. A similar walk through could also be conducted by making material for the situation or writing the key points, outline or details down beforehand.

"I may do 59 power points, that I don't use at the event at all, none of them. But they make me feel that I'm prepared … I do the stress journey beforehand and feel afraid. But when I'm presenting I may feel all right." Female, 52.

Most entrepreneurs had their means of relieving tension before an important meeting, training or presentation, but some also orientated to challenging work by striving for a positive and energetic mindset. This may happen through very versatile actions: mindfulness exercises, socializing, smiling, listing reasons to be grateful or by having a break. Humour and playful behaviour – in very different forms – were also perceived as effective facilitators for eustress.

"When we worked in the open space office I saw how fast you can travel with the office chair down the corridor. It was like I was a child again. It distracted me from the cause of the stress and made me feel good. And when feeling good, it is easier to continue with the challenge." Female, 39.

These entrepreneurs did not use any technological tools to support their mental preparation. However, technology could be helpful both in achieving an appropriate mindset and in offering practical tools for preparation.

Ways to Recover

Ways to recover and detach from work have become more and more challenging, as the obligations and uncompleted tasks can also easily be accessed outside the office. However, the importance of reserving time for recovery – also after positive stress - has been emphasised in prior studies [13,6]. Most of the entrepreneurs acknowledged the benefit of detachment and recovery, although some had difficulties in reserving enough time for it in practice.

Most of the entrepreneurs had proven methods for recovery: physical exercise, social contacts, leisure activities and a sufficient number of breaks were seen as key methods to recover. Still, it was typical to continue work after office hours and do mental preparation – intentionally or uncon-

sciously – during leisure time. Even though technology was appraised as it enables flexible working methods, hours and place, working tools should be designed to also enable blocking work issues and being unavailable when wanted.

DISCUSSION

According to the findings of this study, positive stress is a phenomenon which offers interesting application possibilities for digital service design. The findings suggest that experiencing eustress could be supported 1) by an appropriate design of technological tools in general, and 2) by offering new kinds of tools to facilitate experiences, mind-sets or ways of working which may lead to eustress.

Based on the interviews with the entrepreneurs, the current technology they have in use does not play a major role in facilitating eustress. It seems to have a significant role, however, in removing the barriers to experiencing eustress, supporting concentration on the essential and enabling flexible ways for co-operation. Still, the potential of technology may be notably bigger and can be extended to several other areas central for experiencing eustress.

As technology-aided stress management interventions have mainly shown promising results [17,16,2,12,15], the study of new opportunities for positive stress management seems worthwhile. In addition to new solutions, the development of applications facilitating eustress could utilize some features tested already in the earlier research. The features of recognizing stressful thoughts in the study by Ly et al. [18], emotion regulation in Heber et al. [17, 16], self-awareness exercises of Mood Map [23] and stress recovery themes in Oiva [1] are all relevant also in the context of eustress.

This study works as a starting point to explore the potential connection of eustress and technology. Our intention is to continue the work by studying the phenomenon further and using the insights of this study in co-designing digital service ideas or solutions, which would support experiencing positive stress or create opportunities for such experiences. In the next study phase, we will study eustress experiences when they occur. Apart from self-reporting, the study phase includes physiological measurements.

Both the strengths and limitations of this study lie in the focus on entrepreneurs, which provided solid benefits for this research, but as a special group they do not necessarily reflect the experiences of the average employee. Although the experiences of entrepreneurs give valuable insights, qualitative research focusing on other user groups, such as employees, students or unemployed people would also be interesting in the future.

Based on our experience, approaching stress from the positive angle has been both inspiring and productive. Furthermore, the participants highlighted that the session served as a welcome moment for self-reflection. As we aim at co-design activities in the later phases of the project, increasing

the participants' awareness, interest and engagement related to the themes of the study is a promising start.

CONCLUSION

This article provides understanding on the current and potential role of technology in experiencing positive stress in the daily work of entrepreneurs. The findings show that the current role of technology is twofold: supporting eustress by enhancing the flexibility and fluency of working, but also preventing eustress by the poor functionality or excessive pervasiveness of technology. The role could be shifted from preventing eustress to supporting it by the appropriate design of technological tools. However, the potential role of technology also extends to several other areas central to experiencing eustress: co-creation and collaboration, planning and scheduling, togetherness and shared success, the means for mental preparation and ways to recover. The insights related to these themes can be used as guidance for designing new tools to facilitate eustress in particular (e.g. enhancing self-regulation skills) or developing tools in general to better support eustress experiences.

This study is the first step in our attempts to understand the potential of technology in facilitating experiences of positive stress. It helps us to focus our co-design activities around potential themes, and contributes to the field of HCI and cognitive ergonomics by offering a new perspective in designing for positive emotions and well-being.

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