

Eustress – findings concerning the indication and interpretation of positive stress among entrepreneurs –a case study

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Abstract

This paper examines the experience of eustress, using Selye's (1964, 1987) concept of "good stress". Usually stress is considered and researched as a negative experience, but we suggest that learning to respond to negative stress and demands with positive emotions and behaviours is likely to increase positive drive, creativity and courage (Le Fevre, Matheny & Kolt, 2003; Selye 1964; 1987). However, it is sometimes challenging to draw the line between distress, negative stress and positive stress. Especially entrepreneurs are an important target group of studying positive stress as they have a high responsibility for self-management and deciding over their ways of working. We conducted a case study with 21 entrepreneurs in Finland to find out how the entrepreneurs experience the balance between positive and negative stress. In addition, 9 of the entrepreneurs took part in a physiological stress measurement for a period of one week by wearing sensors and writing a diary of their daily events during the measurement. The entrepreneurs were interviewed before and after the measurement. We conclude that the physiological measurement of stress should be combined with qualitative self-report of participants to understand the valence of the stress, as it can't be concluded from the physiological measures only. In addition, novel digital services could be developed to support learning new ways to respond to stress and provide useful tools for facilitating positive stress and wellbeing at work.

1. Introduction

2. Understanding the Positive Side of Stress

The negative effects of stress and cost of stress for individuals and society are widely researched and well-known (Rahim 1996). Eustress, the positive side of stress has been little studied, because it is considered less recognizable. Eustress has been defined both as good stress, and as optimal amount level of stress. The concept of stress was first launched by Selye (1964) in the 1960s to refer to a number of physiological and psychological reactions to harmful or unfavourable conditions or effects. Selye also made the first distinction between eustress and distress (Selye, 1987). The point for the notion of eustress is that it is very much depending upon individual if he or she interprets the stimuli as positive or negative and how the individual reacts (Le Fevre, Matheny & Kolt, 2003). As positive stress is not easily recognized, there haven't been many efforts to stimulate and take advantage of positive stress.

As Mesler (1996) has pointed out: "there are relative few studies, and no adequate models proposing the concept of eustress and its associated regenerative qualities." Some previous studies have, however, found eustress for instance in work environment and hospital administrators (Simmons & Nelson 2001), as well as in students' learning environments (Gibbons, Dembster & Moutray 2007; O'Sullivan, 2010). In stress studies the starting point is often the negative stress and coping with or eliminating the main stressors. However, some positive stress is needed as a source of creativity, enthusiasm, drive and motivation that will take individuals and organizations towards new challenges. Too much stress will influence negatively and paralyze individuals and

working places but some amount of positive stress will boost the performance into new level. However, although the line between positive and negative stress is difficult to draw, it is essential to the study the balance between the positive and negative stress (Vartiovaara, 2004).

Both positive and negative stress causes changes in an individual's physiology. At best, the stress encourages the body to perform better on the task at hand. At worst, prolonged stress confuses the body's equilibrium. This reflects disturbance of the immune system, the central nervous system and hormone balance. Psychological stress causes sympathetic activation in the autonomic nervous system (ANS) which reduces heart rate variability (HRV) (Chandola et al., 2010). Long-term sympathetic activation strains the body and thus successful recovery after a stressful situation is a central issue in stress management (Kinnunen, 2005). HRV refers to the variation in intervals between consecutive heartbeats (Task Force, 1996). Person with a low psychological stress typically exhibit high HRV with efficient autonomic mechanisms and good adaptation ability, while high psychological stress reduces HRV as an indicator of an abnormal and insufficiently adapted ANS (Porges, 1992; Porges, 1995; Vanderlei et al., 2009). Furthermore, subjective stress is thought to be associated with decreased HRV, diseases, and ill-health (Thayer et al., 2010; Jarczok et al., 2013). Eustress is related to the concept of flow (Csikszentmihalyi, 2008). In flow person is interested in dedicating activity and is experiencing a deep sense of enjoyment, creativity and inclusion of life. The optimal flow experience occurs when the human has equivalent skills to the challenge at hand and she or he is most focused in dedicating activity. Csikszentmihalyi noticed in his research that people are most creative and happiest precisely at such moments in their lives. Also, a more holistic concept of energy and wellbeing, e.g. vitality (see Ryan & Frederick, 1997) is related to eustress concept. Vital person is found to be more intrinsically motivated, efficient in self-control (Muraven, Gagne & Rosman, 2008), happier and more satisfied with life (Uysal et al., 2014), more self-actualized and higher in self-esteem (Ryan & Frederick, 1997). In general, vital person has better coping skills and general wellbeing than his or her less vital counterparts (e.g. Fini et al., 2010).

Positive stress, vitality and flow are essential aspects affecting entrepreneurs' well-being and performance in their business. The role of affect is in general important in the entrepreneurial process, as entrepreneurs often make new ventures, make decisions, take actions and identify opportunities individually rather than part of a large group or organization. Also, the environments in which entrepreneurs work are often highly unpredictable and rapidly changing and as a result individuals can't follow prescribed set of procedures (Baron, 2008). Indeed, entrepreneurs are in high need of self-management, especially considering how much they work and how they draw the line between positive and negative stress.

Several new devices for monitoring physiological stress, arousal, quality of sleep and physical activity have been developed lately. Especially different kinds of watches, wristbands and wearable devices to measure stress have become very popular.

In this case study, we research how the entrepreneurs experience the balance between positive and negative stress. Our research combines qualitative research on physiological measurements. Our approach is based on dialogue between researchers and participants in different stages of the study.

3. Data and Methodology

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. For many, after working many years as employee, becoming an entrepreneur meant a considerable life change with completely new working environment and new decisions and responsibilities.

Method

We conducted a case study with 21 entrepreneurs in Finland to find out how the entrepreneurs experience the balance between positive and negative stress. Nine of the entrepreneurs took part in a physiological Firstbeatstress measurement for a period of three days by wearing sensors. Firstbeat Bodyguard and the Firstbeat Analysis Server software are based by analyzing the beat-to-beat heart-rate variability (HRV) (Firstbeat2014) (see Picture 1). The software categorizes the HRV data into different physiological states such as stress, recovery, and the physical activities of different intensities by taking into account individual characteristics (Martinmäki et al., 2006). Thereafter, the software creates variables, such as stress index and recovery index, to describe the state of the body at any given moment (Saalasti2003; Kettunen2005; Kettunen and Saalasti2008; First beat Technologies Ltd, 2014).

The physiological stress measurement is based on the heartbeat changes and it doesn't differentiate between positive and negative stress. The participants wore the sensors through day and night but took them off when they were having a bath or a shower or swimming. The participants were also writing a diary of their daily events and eustress and distress experiences, emotions and moods during the measurement week.



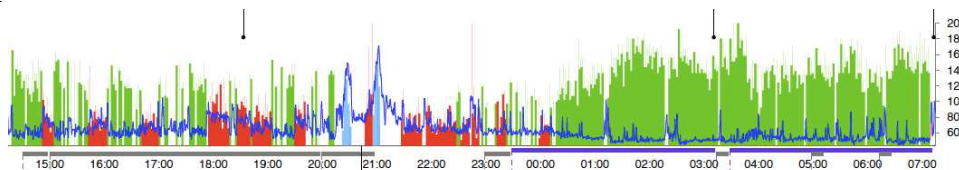
Picture 1. Stress measurement with wearable sensors. (Picture: Firstbeat)

We conducted semi-structured entrepreneur interviews focusing on the participants' personal experiences of positive stress before and after the measurement. The face-to-face interviews took approximately 2 hours. The interviews were taped and transcript. The questions covered the situations when the participants themselves interpreted experiencing positive stress. In addition, the results of the wellbeing and physiological measurement were reviewed together with researchers and participants. We asked from the participants how they saw the results: what surprised in the measurement results and well-being analysis? In addition, we asked: Did you try certain new types of working methods or means of relaxing that could have an impact on the experience of eustress? What kind of thoughts and questions came into your mind regarding your well-being analysis? Did you do things differently on different days?

4. Analysis & Findings

4. 1. Physiological Stress Measurement

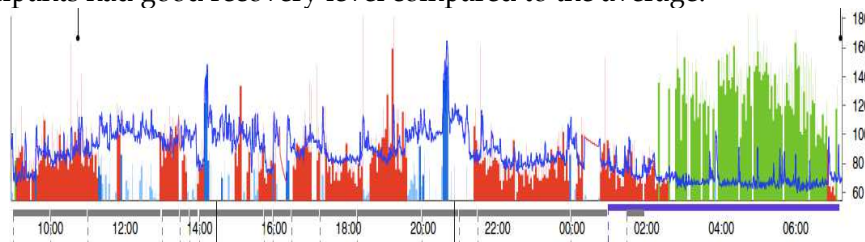
The results of the wellbeing analysis and physiological measurement were reviewed together with researchers and entrepreneurs. The wellbeing data showed the stress reactions in red colour and



Picture 2. An example of wellbeing data analysis: Stress reactions are shown in red colour and recovery sessions with green during a day.

recovery sessions in green (in Picture 2.) Stress reaction means a rise in the level of arousal in the body. The reaction can be positive or negative. The recovery means essential calming of down of the body. Important recovery periods are during the sleep at night, breaks and soothing moments of the day. According to First beat data, on average, the stress response is 47 % a day and there is recovery of 25% per day. Exercising and daily activity was seen in the analysis as dark or light blue remarks. From the wellbeing analysis it could be seen what was the most stressful 15 minutes period during the measurement including most stress reactions and the amount of stress reactions a day. The wellbeing analysis included information between stress and recovery balance; whether the individual's recourses were increasing or reducing. Analysis also indicated if the sleep phase length was good, moderate or weak compared to the average of the individual's age group. Also the quality of sleep was measured; was it good enough to lead to recovery.

According to the data, most of the entrepreneurs had normal (8 out of 9) or less than average percentage of stress reactions during the day. However, the measurement average shows that the entrepreneurs' recovery from the stress was mostly weak or moderate during the day: Four participants' recovery was measured as weak, three participants' stress recovery level was moderate and two participants had good recovery level compared to the average.



Picture 3. An example of an entrepreneur's stressful period in the measurement: No recovery at all during the day and too short sleeping phase.

The recovery from the sleep was similar to recovery during the day: mostly weak or moderate during the night. Four participants' recovery was measured as weak, three participants recovery level was moderate and two participants had good recovery level compared to the average. On the average the length of sleep cycle of the entrepreneurs was 8,20 hours so it was on good level. However, there were differences between individuals, the average sleep cycle varying from 5,38 hours to 9,25 hours.

4. 2. Interpretation of Positive Stress

According to the physiological measurement the entrepreneurs were exposed to normal or even less than average amount of stress reactions in their daily life. However, their recovery from the stress was mainly weak or only moderate. As earlier mentioned, the physiological measurement doesn't make a difference between positive and negative experiences, so from the physiological measurement it is not possible to draw conclusions about the experience of positive stress. The physiological reaction to positive or negative stress can be the same. It is very much depending upon individual if he or she interprets the stimuli as positive or negative and how the individual reacts.

In the diaries participants also reflected their daily events and eustress and distress experiences, emotions and moods during the measurement week. The entrepreneurs reported having many professional challenges and demanding and stressful events during the test period. The participants described from one to three positive stress experiences during that week. The situations, in which positive stress was experienced, were for example a presentation about new topic, a demanding negotiation, preparing a commission offer or a sales meeting with a potential customer. The positive stress experience was described as lasting quite short time period from one to five hours. The entrepreneurs reflected that drawing the line between positive and negative stress

was quite challenging and situations were mixed with both positive and negative emotions, such as excitement, joy and anxiety. One entrepreneur described the shifting between positive and negative emotions as following in a demanding negotiation:

"I got irritated at first, calmed down a little, and irritated again. It seemed that we were not making a progress at all, and we have not even been talking about the same thing."

In the diaries, on the one hand excitement, nervousness, energetic, joyful and on the other hand peaceful, relaxed and confident emotions were associated with a positive stress experience. Negative stress was associated with anxious, irritated, insecure emotions and feeling of crippling fatigue.

In the interviews it came out that the some of the entrepreneurs were quite surprised about the results of wellbeing analysis, especially about their weak stress recovery during the day and night. When we reviewed the positive stress experiences reported in the diaries and with entrepreneurs and compared them with measurement data, the results were quite surprising. The measurement indicated quite different results during the positive stress experiences among the participants. For some, the measurement showed a clear increased heart rate during the positive stress experience. For instance, for one entrepreneur who described her exiting presentation situation as a positive stress experience, the physiological measurement showed so high heart rate that the well being analysis indicated that the person is exercising. For others, during the periods of positive stress the physiological measurement showed no change or a slight increase in heart rate and including period of recovery. The periods after positive stress experience were also different and individual: for one entrepreneur the "alertness" continued hours after the period. Another entrepreneur started a solid recovery soon after the positive stress situation.

5. Results and Discussion

According to the physiological measurement the entrepreneurs were experiencing normal amounts of stress reactions during the test week. What was surprising in the results was that the recovery of the stress was in a weak level. Even the entrepreneurs were having enough sleep; the quality of sleep wasn't good enough to help the recovery. In the diaries all the entrepreneurs described at least on positive stress experience during the week. When compared the positive experience in the diaries to the physiological measurement; there were many individual differences. In the diaries the positive stress experience was most often associated with mixed emotions such as feeling excited, nervous, energetic and joyful at the same time. Some entrepreneurs associated positive stress with the peaceful, focused, relaxed and confident emotions. Balancing between positive and negatives stress was found challenging, but it was found typical in challenging working situations (see Figure 3.)

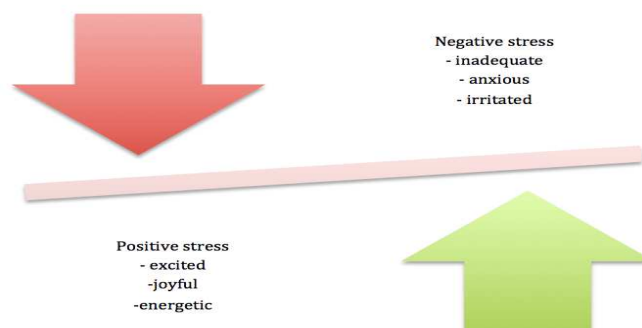


Figure 3. The basic emotions or their derivate associated to the negative and positive stress among entrepreneurs.

The combination of physiological stress measurement with interpretation with the participants turned out fruitful. There were also challenges related both to the qualitative methods used and the measurement data. For instance, even though the qualitative data is collected

systematically it can include some unclear materials and absence of facts. Also the wellbeing data included some occasional measurement outage. Moreover the study period was from a relatively short time, so that the results must be interpreted with caution.

However, the study confirmed interestingly that the entrepreneurs were experiencing both positive and negative stress and the experience and interpretation of positive stress was individual. In the future, it would be interesting to develop methods and services both to facilitate the experience of positive stress and to recover from stress easier.

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