

Stress-related Exhaustion and Emotion Regulation among University Students

Mid Sweden University
Master's Degree Project in Psychology
Two-year Advanced level 30 ECTS
Semester/Year: Spring 2018
Course code/Registration number: PS071A
Degree programme: Master of Science

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Abstract

There have been an extensive increase of stress-related strains and mental illness reported in relation to the years of education – ranging from elementary to the years of university. However, the underlying cause of the massive increase is still unexplained as well as its impact on the risk of developing stress-related exhaustion. An exhaustion which may have a major impact on the individual's wellbeing, performance and entry into work life. How university students regulate emotions and the effects of emotion regulation strategies in relation to coping with school-related stress have just recently been gaining attention in the literature. The present study has sought to impact this phenomenon, by examining the influence of reappraisal and suppression on perceived stress and risk of exhaustion in university students (N=253) across Sweden by means of an online survey. A significant effect emerged indicating that reappraisal correlated negative to perceived stress and risk of exhaustion disorder, whereas suppression demonstrated a positive correlation. Both of the two strategies could predict perceived level of stress among the students, but when analysing whether emotion regulation strategy and perceived stress could predict risk of exhaustion, only perceived level of stress contributed significantly to the two models. Although the results are preliminary and need further verification in future studies, they can be seen as important for incorporating a heightened focus on emotion regulation in relation to educational settings.

Keywords: stress, exhaustion, students, emotion regulation, reappraisal, suppression, online survey

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Introduction

Feelings of stress are a part of everyday life and the processes involved motivate individuals to react and adapt to external and internal demands. However, if the stress is not adequately managed or properly recovered from, physiological- and psychological problems may arise in otherwise healthy and high performing individuals (Jonsdottir et al., 2012; McEwen, 2006; McEwen & Seeman, 2009). Symptoms of chronic psychological stress are presumably not rare in the general population, as “being stressed out” is something commonly referred to in all kinds of domains, for example work, school or just everyday life (Folkhälsomyndigheten, 2016). Lately, an extensive increase of stress and stress-related problems associated with educational settings have been reported in Sweden– ranging from elementary school to the years of university (Folkhälsomyndigheten, 2016; Uppsala Studentkår, 2017). Although students face many potential sources of psychological stress, (i.e. proving themselves, numerous exams, and worries about their future), the underlying cause of the massive increase is still unexplained (Li, Han, Wang, Sun, & Cheng, 2018; Sanders & Lushington, 2002; Salmela-Aro, Kiuru, Pietikäinen, & Jokela, 2008; Stansfeld & Candy, 2006).

For some individuals the effects of chronic stress are positive or minimal, whereas for others the effects can be catastrophically resulting in negative impact on mental health (Salmela-Aro, Kiuru, Leskinen, & Nurmi, 2009; Åsberg et al., 2010). Hence, due to individual differences in stress resistance and strategies of coping, some individuals are more successful in adapting and managing the stressful psychological demands (Gross, 2014; Nolen-Hoeksema, Morrow, & Fredrickson, 1993). Emotion regulation have become increasingly popular in relation to understanding differences in psychological functioning, as it is one of the fastest growing areas within the field of psychology. Here, *Gross's Process Model of Emotion Regulation* (Gross, 1998) is the most used model to date. Emotion regulation involves the selection and application of various strategies that help individuals to

control the psychological demands of their emotions by means of regulating which emotions individuals have, when they have them, and how they experience and express those emotions (Gross, 2014). Two of the main strategies of emotion regulation are *reappraisal* and *suppression* (Gross & John, 2003). Reappraisal which have been associated with more positive interpretations and buffering against negative stress-related outcomes (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Brackett, Palomera, Mojsa-Kaja, Reyes, & Salovey, 2010; Gross, 2014). Whereas, suppression can and often does led to more negative stress-related outcomes in relation to psychological wellbeing and mental health (Gross, 2014; Gross & Thompson, 2007).

The current paper will adopt a standpoint of emotion regulation to better understand individual differences in stress resistance among Students. Thereafter, a study will follow investigating whether habitually usage of reappraisal or suppression may have a mediating effect on perceived level of stress and stress-related exhaustion among University Students in Sweden.

Psychological Stress

Stress is often described as emotional and psychological challenges and is general thought as something *'bad'* (McEwen, 2000b; 2007). That is, an imbalance resulting in negative distress and anxiety as it goes beyond individual's ability to control the stressful demands (McEwen, 2007). However, stress can also be *'good'* for us, as stressful experiences of limited duration in which individuals can properly manage that result in excitement and motivation (McEwen, 2000b, 2007). The literature often distinguishes between *acute-* and *chronic stress* in relation *'good'* and *'bad'* stress (Almén, 2017).

Acute stress is an aggressive type of stress, resulting in intense and short-lived stress reactions acting to co-ordinate and maintain bodily homeostasis (Guilliams, & Edwards, 2010). If the stress reactions are not properly shut off when no longer needed, or repeated without enough recovery period in between, chronic stress occur. Chronic stress is characterized by far less intense, but longer-lived reactions characterized by defeat (Chrousos, 2009; Guilliams & Edwards, 2010). When distinguishing between acute and chronic stress, the magnitude and chronicity of the stress, but also individual differences in stress resistance is of importance (Chrousos, 2009). Hence, the stressors per se do not contribute to chronic stress, it is merely a consequence of the relationship between the psychological demands and the resources available for the individuals to cope with the stressor (Chrousos, 2009; Rodrigues, LeDoux, & Sapolsky, 2009).

During times of stress, all available resources of the individual are mobilized to cope with the stressor – processes that the stress literature refer to as *fight- or flight responses* (Almén, 2017). The main system involved in the fight- of flight responses is the *autonomic nervous system* (ANS), which include two central systems: the *parasympathetic- and sympathetic system*, both of importance for the stress and recovery processes of the individuals (McEwen, 2000ab). The sympathetic system oversees the activity aspect, resulting

in actions of coping with a stressor. As the sympathetic system activity is heightened, it releases stress hormones in the blood to aid the mobilizing of resources accordingly, for example increasing mental activity (i.e. heighten the learning and memory potential) in the individuals (Popoli, Yan, McEwen, & Sanacora, 2011). The parasympathetic system on the other hand, have a key role in processes of rest and recovery in the individuals. Specifically, when the stressor is coped with, the para-sympathetic activation restores the effects of the sympathetic activation (McEwen, 2000ab). These two systems work together in a rest/activity cycle, to maintain a balanced homeostasis. Thus, as the activity of one of the systems increase, the other one decrease: a function greatly beneficial and protective during times of acute stress (McEwen, 2007; McEwen & Seeman, 2009).

However, serious stress-related health issues may arise when the stress system is dysregulated or not able to properly go back to recovery (McEwen, 2007). Thus, a physiological '*wear and tear*' on the body accumulate as a consequence of the demands of repeated acute stress or chronic stress (McEwen, 2000b, 2007; McEwen & Seeman, 2009). The wear and tear processes may result in various behavioural alterations in the individuals, such as changes in cognitive function and memory formation or adverse health consequences and development of emotional disorders (Fox, 2008; Guilliams & Edwards, 2010; Miller, Chen, & Zhou, 2007; Rodrigues et al., 2009). Important to point out, individual differences in the subjective experience of stress can decrease or increase the risk of wear and tear processes (McEwen & Seeman, 2009). Basically, our stress system is heavily influenced by genetic, environmental and developmental factors, contributing to difference in resistance and health outcomes in individuals when handling stressful psychological challenges – (McEwen & Seeman, 2009; Guilliams & Edwards, 2010) – differences making some individuals' more or less prone to stress-related mental illness.

The Impact of Stress on Mental Health

It is well known that chronic levels of stress in general is accompanied by worse mental health, apparent across the entire lifespan (Miller et al., 2007). Hence, the exposure to chronically heightened levels of stress mediators can markedly increase individual's vulnerability to clinical symptoms and stress-related psychological conditions (Glise, Ahlborg, & Jonsdottir, 2014; McEwen, 2000a, 2006; Åsberg et al., 2010).

Stress affect all individuals, and all react to stress differently and have their specific stress resistance. How the stress reactions express themselves in the individuals are affected by various domains, such the nature of the stressor, the specific emotions elicited, controllability of the stressor, individual differences in stress reaction (Miller et al., 2007) as well as the existence of protective resources (e.g. social support or self-esteem) available for the individual's (Li et al., 2018; Zimet, Dahlem, Zimet, & Farley, 1988). If the psychological and bodily symptoms of chronic stress would be ignored for too long, then exhaustion soon follow. The Public Health Authority of Sweden recently published their annual report, indicating among others, that stress-related mental health illness is a big public health issue (Folkhälsomyndigheten, 2018). In Sweden, stress-related mental problems are among the most common causes of long-term sick leave (95%) and still increasing across all ages (Folkhälsomyndigheten, 2018; Försäkringskassan, 2016; Socialstyrelsen, 2017).

Stress-Related Disorders

Various psychological diagnoses are used to guide treatment when the stress-related symptoms cause severe impairments in everyday functioning for the individuals (Glise et al., 2014). The international Classification of Diseases and Related Health Problems (ICD-10; WHO, 1992) have put forth various guidelines associated with stress-related psychological disorders; such as *adjustment disorder* (F43.2); *acute stress disorder* (F43.0); *posttraumatic stress disorder* (F43.1); and *exhaustion disorder* (F43.8A).

Adjustment disorder, describe a state of subjective distress and emotional disturbance (often depressive in nature). The diagnosis emphasizes difficulties in adapting to stressful or significant life events, and that some individuals' may be so severely affected that their level of distress interferes with social functioning or occupation (Bachem & Casey, 2018; WHO, 1992). Despite clinical suggestion of a large prevalence in the population and being among the seventh most frequently diagnosed stress-related disorders - adjustment disorder has been rather neglected in research. Mainly due to difficulties distinguish the disorder from normal stress reactions (Bachem & Casey, 2018; Carta, Balestrieri, Murru, & Hardoy, 2009). Acute stress disorder on the other hand, describe an intense emotional reaction occurring from 48hours to less than a month after exposure to a traumatic event. If sustained, the symptoms of acute stress disorder may or may not be developed into PTSD. Hence, one of the main goals with acute stress disorder is to predict PTSD, by means of identification of acutely traumatized individuals who might develop the condition (Bryant, 2017; Åsberg et al., 2010).

Although exhaustion is not a new state per se, but for the moment, Sweden is the only country which recommend a specific ICD-10 code handling it as a disorder (Socialstyrelsen, 2003). Worldwide, other terms have been used to describe the core symptomatology regarding psychological and mental outcomes of chronic stress exposure (Åsberg et al., 2010). Burnout have in general been one of the most widely used and internationally recognized term, describing the outcome of unsolved and chronic stress due to a mismatch between demands and available resources in the individuals (Åsberg et al., 2010). Exhaustion disorder are highly correlated with emotional exhaustion defined by Maslach (1978) in relation to early studies of burnout (Åsberg et al., 2010). That is, feeling emotionally drained, physical and mental exhaustion, a lack of energy, as well as somatic- and psychosomatic problems (Maslach & Jackson, 1981). As for exhaustion disorder, the concept refers to individuals suffering from pronounced mental and physical exhaustion due to

prolonged levels of stress (Hasselberg, Jonsdottir, Ellbin, & Skagert, 2014; Åsberg et al., 2010). Here, a failure to fully recover after stress are one of the most central factors in the development of exhaustion disorder (Born, Lange, Hansen, Mölle, & Fehm, 1997). However, compared to burnout, which have been most associated with work-related stress, exhaustion disorder leaves the stressor unspecified (Glise et al., 2014; Hasselberg et al., 2014; Åsberg et al., 2010). Hence, it is the complex combination of various stressors that may cause the stress-related mental exhaustion, making both work and non-work stressors of equally importance to the onset of the disorder (Hasselberg et al., 2014).

Emotions and Stress-related Exhaustion in Educational Settings

For many years, stress-related problems of exhaustion and burnout were regarded a work-related hazard only (Maslach & Leiter, 2016). Lately, the problems have also been applied to the domains of school (Parker & Salmela-Aro, 2011), as an extensive increase of stress and stress-related strains associated with educational settings have been reported – ranging from elementary to the years of university (Folkhälsomyndigheten, 2016; Raiziene, Pilkauskaite-Valickiene, & Zukauskiene, 2014; Uppsala Studentkår, 2017). Although the underlying cause of the massive increase is still unexplained, various mediators have been proposed: such as high demands, overtaxing schoolwork, the pressure of achievement, a need for acknowledgement and doing well (Maslach & Leiter, 2016; Parker & Salmela-Aro, 2011; Raiziene et al., 2014).

Stress is indeed a reality of our everyday life, and students have a unique cluster of stressful experiences during their years in school (Burić, Sorić, & Penezić, 2016; Raiziene et al., 2014; Salmela-Aro et al., 2009). School-related stress involves numerous emotions – both negative and positive – in various frequency and intensities, consequently influence achievement and shape personal growth in the students accordingly. Pleasant emotional experience contributes to higher levels of engagement for the students and in an openness to

learn new material, and better academic performance. On the other hand, factors such as a heavy workload and unrealistic expectations may stress up the students in a sense that they may feel that they do more than they can handle, making them frustrated and unable to focus on the work required of them. Hence, although acute stress is beneficial as it increases motivation and concentration in students, chronically heightened stress levels and negative emotional experiences may instead kill their drive and motivation, resulting in lower academic achievement, reduced life satisfaction and school drop-out (Burić et al., 2016; Korhonen, Linnanmäki, & Aunio, 2014; Raiziene et al., 2014; Salmela-Aro et al., 2009).

During the years in University, although the students are not employed per se, one could say that in the context of school, their core activity is considered work. Specifically, university students need to attend classes, do assignments and pass exams, all to require a degree and to receive money for their efforts (Salmela-Aro et al., 2008). Moreover, the fact that many students also combine part time job with many hours of studies may have a crucial impact on their level of stress. Part time work and yet studying full time, may result in failure to properly recover from the stress and sleep deprivation – making them more prone of exhaustion (Besèr, Sorjonen, Wahlberg, Peterson, Nygren, & Åsberg, 2014; Socialstyrelsen, 2003). In 2017, the Student Union of Uppsala University published a report which demonstrated a high degree of school-related strains among students at various faculties (Uppsala Studentkår, 2017). Here, 50 percent of the students reported feeling stressed every week, and approximately half of the respondents (46.1 %) reported feelings of tiredness and exhaustion every week, whereas a third (31,2%) reported troubles every month. The majority (90,1 %) of the students feeling stress reported a school-related cause. Other symptoms such as anxiety, worrying, headache, gastrointestinal discomfort, depressive symptoms, difficulties with concentration, and bodily pain were also found (Uppsala Studentkår, 2017). In fact, stress-related exhaustion is often accompanied by numerous different somatic complaints,

with gastrointestinal problems, dizziness, headaches and back pain among the most prevalent. Yet individuals more often seek medical help for a single symptom, without recognition of the underlying stress and various other mental health issues (Glise et al., 2014).

A rather new term “*school burnout*”, refer to a deleterious consequence to school-related stress and exhaustion (Parker & Salmela-Aro, 2011; Salmela-Aro et al., 2009; Salmela-Aro et al., 2008). The symptoms are characterized by a detached attitude toward school, chronic exhaustion associated with the demands of school, and a belief or feelings of inadequacy of accomplishment as a student. Resulting from a discrepancy between the student’s engagement and resources and their expectations for success in school (Salmela-Aro et al., 2009). School burnout during late adolescences have demonstrated to have a negative impact on life satisfaction later on (Raiziene et al., 2014). However, there are no conclusive results of whom are more predisposed to develop exhaustion or burnout in general. What is known is that the outcome of chronic stress varies considerably because of individual differences in interpretation and in the choice of coping strategies (Cherniss, 1995; Nolen-Hoeksema et al., 1993). Cherniss (1995) were one of the first to point out the importance of successful use strategies in coping with stressors in relation to developing exhaustion and burnout. Since then, an increase of models has focused on the idea of a complex interaction between stress vulnerability and coping strategies among individuals (Hallsten, Bellaagh, & Gustafsson, 2002).

Emotions and Emotion Regulation

Emotion regulation, a form of self-regulation defined as goal directed processes which influence the emotional experience. That is, strategies with the specific aim to modify when and how specific emotions (both positive and negative) are expressed or experienced as well as which emotion one has (Gross, 1998; Gross & Thompson, 2007). How individuals’ emotions are regulated have been suggested as something vital in maintaining healthy

relationships, psychological wellbeing (Gross & John, 2003; Gross & Thompson, 2007), and positive work performance (Aldao et al., 2010).

First off, what are emotions? The literature often refers to subjective experiences arising as a reaction to a relevant situation (internal or external) and consequently influencing the mind, behaviour or situations (Gross, 2014). Emotions are often associated to subjective goals, central to our sense of self, both on a conscious and unconscious level (Gross & Thompson, 2007). Thus, whatever the subjective goal, it's the meaning of that particular goal that gives rise to the emotional experience - and consequently, the emotion will be changed in the light of the changing the subjective meaning of the emotion (Gross, 2014; Gross & Thompson, 2007). But emotions do not only make individuals to "feel", they make individuals act and motivate them to acquire their goals. More specifically, emotions coordinate the response system, direct attention to crucial features of a given situation, tune decision-making, optimize sensory intake, facilitate social interaction, and enhance episodic memory (Gross, 2014). For example, when faced with stressful life events, individuals do not passively experience stress and the associated emotions, they instead act upon them in an active manner to change the specific emotional experience involved (Gross & Thompson, 2007). When the emotions are of the wrong type, intensity or duration for the given situation – it is at such moments that individuals need emotion regulation (Gross, 2014). Hence, individuals are sometimes required to regulate their emotional experiences and expressions accordingly to better adapt to the changes and maintain homeostasis (Fox, 2008).

The Model of Emotion Regulation

In order to better understand emotions and the processes involved, one also need to understand how individuals differ in their emotional experience, and how they process, respond to and regulate their emotions according to the affective situations (Fox, 2008). There are many complex processes involved in emotion regulation and they vary considerably in the

specific degree to which they are intentional (explicit) or automatic (implicit). That is, emotion regulation occurs on a continuum, ranging from uncontrolled and automatic processes of emotion regulation (unconscious, and effortless) to controlled regulation (explicit, conscious, effortful) (Gross, 2014; Gross & Thompson, 2007). Gross (1998) put forth a model, specifying the sequence of processes involved in emotion regulation. The model considered five specific categories of the emotion-generative process as targets for potential regulation (Gross, 2014; Gross & Thompson, 2007): *situation selection, situation modification, attentional deployment, cognitive change, and response modulation*.

First in order is situation selection, the most forward-looking emotion regulation category as it involve taking actions to make it more or less likely to end up in a situation which will give rise to desirable or unwanted emotions. For example, a shy person avoiding social situations. Secondly, situation modification refers to the efforts of individuals to directly modify the specific situation and thereby altering the emotional impact. For example, crying during an ongoing argument, an act which may result in sympathy rather than anger in the other part (Gross, 2014; Gross & Thompson, 2007). Situation selection and situation modification help the individuals to shape the surrounding environment and therefore modify the emotional experience accordingly, however, individuals can also regulate emotions without changing the situation per se (Gross & Thompson, 2007). Here, attentional deployment, refers to influencing emotions by focusing attention within a given situation (Gross, 2014; Gross & Thompson, 2007). The category includes several different strategies: such as, redirecting attention on other aspects of a situation or moving attention away from the situation altogether (also known as distraction), changing the internal focus (i.e. bring back memories or thoughts), and to focusing attention on other emotional features of a situation (Gross, 2014; Gross & Thompson, 2007). However, when attention is repeatedly directed to the negative feelings and their cause, *ruminatio*n occur (Gross & Thompson,

2007). The fourth category is cognitive change, which emphasizes how individuals appraise a situation and evaluate their capacity to manage the demands it poses. Thus, by changing the meaning of how to think about a situation, one can alter the emotional impact (Gross, 2014; Gross & Thompson, 2007). Cognitive change can be applied to external situations (e.g. seeing a job interview as a chance of learning about the workplace), as well as internal situations (e.g. I'm not anxious about the interview, I'm getting pumped up). Reappraisal is one strategy involved in the cognitive change category that has been extensively researched lately (Gross, 2014). The fifth category is response modulation, which take place last in the emotion-generative process, after the emotion already have been initiated (Gross & Thompson, 2007). The category per se refer to the attempt to directly influence the experiential, behavioural, or physiological aspect of the emotional responses. One well-studied strategy is *suppression* (Gross & Thompson, 2007). Numerous other emotion regulation strategies can be adopted here, such as, physical exercise or meditation as a way of decrease negative emotions. But also, alcohol, cigarettes, drugs and food can be used to down-regulate or escape the emotional experiences (Aldao et al., 2010; Gross, 2014).

These five categories are distinguished by the point in the emotion-generative process at which they have their primary impact (Gross, 2014). From the idea that emotions develop over time, intervening at different time points in the emotion-generative process should consequently result in different outcomes for the individuals. Across multiple domains, emotion regulation strategies do differ markedly in their outcomes, differences that are substantial and meaningful for the individuals – especially through reappraisal and suppression. The study of emotion regulation through suppression and reappraisal has formed the core research on emotion regulation (Olatunji, Naragon-Gainey, & Wolitzky-Taylor, 2013).

The Impact of Reappraisal and Suppression on Mental Health

Over the years, emotion regulation has been increasingly incorporated into various models of emotional disorders (Aldao et al., 2010; Hu et al., 2014). As, all individuals use emotion regulation as a way of helping them achieve their emotional goals in relation to dealing with the stressor, the use of maladaptive emotion regulation strategies may begin to interfere with everyday functioning for the individuals and may lead to various form of mental illness (Johnstone & Walter, 2014; Gross & Levenson, 1997), for example anxiety (Campbell-Sills, Ellard, & Barlow, 2014), and depression (Ehring, Tuschen-Caffier, Schnülle, Fischer, & Gross, 2010). In relation to reappraisal and suppression, research have continually indicated that each of them is differently related to psychological functioning and mental health (Hu et al., 2014; Gross, 2014).

Reappraisal, a strategy that intervene before the emotional response have been fully generated. The strategy per se work as a cognitive repair mechanism by efficiently alter the emotional impact by means of changing or appraising the meaning of the emotional experience or situation (Gross & John, 2003; Gross, 2014). Reappraisal have overall been associated with more positive emotional experience, life satisfaction, optimism, better self-esteem and to promote psychological wellbeing (Gross, 2014; Hu et al., 2014), Cognitively, reappraisal result in improved memory, and enhanced test performance (Jamieson, Mendes, Blackstock, & Schmader, 2010). The strategy is also protective for individual's wellbeing during times of failure (Hanley, Palejwala, Hanley, Canto, & Garland, 2015). Thus, effectively and successful use of reappraisal can diminish the negative impact (Hu et al., 2014) and contribute to reduced physiological and behavioural responding to aversive factors, as well as buffer against depressive symptoms and other mental illnesses (Willroth & Hilimire, 2016).

Suppression on the other hand is a strategy in which the behavioural reactions and emotional expressions of individuals are made covert and not shown to others by inhibiting ongoing emotion-expressive behaviour. For example, restraining or inhibiting external facial, bodily, or other behavioural signs of the emotional impact (Gross & John, 2003; Gross, 2014). The attempt to change an emotion which already have arose, takes a great deal of cognitive demand and may result in unintended maladaptive side-effects. For example, inhibiting positive expressions or not directly targeting the negative emotions, and therefore might consequently linger unresolved (Gross & John, 2003). Habitually usage of suppression often results in a sense of not being true to oneself as a result of hiding one's true emotions, report less satisfaction with themselves, are more pessimistic about their future, and more prone to depression (Gross & John, 2003; Joormann & Gotlib, 2010). Research have indicated that suppression have a negative impact on individuals emotionality, increase physiological and sympathetic activation as well as on overall wellbeing (Hu et al., 2014; Srivastava, Tamir, McGonigal, John, & Gross, 2009). More specifically, individuals who suppress feel more negative emotions, cope less effectively, and have less social support and relationships – factors that increase the risk for mental illness (Hu et al., 2014; Gross, 2014; Glise et al., 2014). When suppressing emotions, one losses the ability to change the environment in relation to the upsetting situation, making the individual more likely to ruminate about their negative mood and self. That is, repeatedly focusing their attention on the symptoms of their distress, the cause, and its negative consequences, as opposed to the solution – resulting in worsening or prolonged symptoms of mental illness (Nolen-Hoeksema et al., 1993; Papageorgiou & Wells, 2009).

There might be times when suppression is the only- or the better option (i.e. to better maintain focus; Burić et al., 2016), but in term of everyday functioning, reappraisal has more adaptive consequences for wellbeing – making the strategy seem more preferable

(Gross, 2014). However, individuals differ extensively in their ability to track subtle emotions and regulate them successfully to the given situation. Some individuals master this ability very well, whereas others have little or no emotional awareness, suggested as a key factor in successful emotion regulation (Gross, 2014). Hence, emotional awareness allows individuals to experience emotions by comparing themselves and the meaning of subjective goals to their personal standards, consider past and future events, assessing their personal characteristics, but also compare themselves against their beliefs of how they are perceived by others (Leary & Gohar, 2014).

The Impact of Reappraisal and Suppression on Stress

Emotion regulation is a complex ongoing mental process, and the habitual usage of a specific strategies may cause numerous different outcomes in individuals when faced with stressful situations (Richardson, 2017). Hence, a successful ability to identify, monitor, evaluate and modify emotional experiences and reactions may contribute to an increased tolerance to stress and more positive emotional experience (Gross & Thompson, 2007). Yet, only a limited research has examined the individual differences of emotion regulation as a predictor for stress.

Studies have recently begun to shed light on emotion regulation in the complexity of daily life stress (Brans, Koval, Verduyn, Lim, & Kuppens, 2013; Richardson, 2017), such as time pressures, daily hassles at work or school, economic problems and interpersonal conflicts. The suggestion is that the ability to regulate one's emotions accurately to the given stressful situation, may provide a greater control over the emotional states (Ganzel, Rarick, & Morris, 2016). Compared to suppression, reappraisal have been demonstrated to work protective during daily life stress and result in better recovery processes in the individuals after experiencing stressful events (Schraub, Turgut, Clavairoly, & Sonntag, 2013). The strategy has been positively associated with personal accomplishment and job

satisfaction (Brackett et al., 2010). Whereas, reappraisal lead to lower negativity and more positivity in everyday lives of individuals, engaging in suppression resulted in heightened vulnerability to negative distress, especially during days of high stress (Richardson, 2017). As the successful use of reappraisal has been positively associated with managing stress, the strategy per se could be a major predictor of stress-related outcomes in education as well.

Although the research is scarce, research is now in the beginning to elucidate the impact of emotion regulation in relation to academia as well (Burić et al., 2016; Seibert, Bauer, May, & Fincham, 2017). The different use of specific emotion regulation strategies been demonstrated to influence the outcome of school-related stress and to predict academic performance (Burić et al., 2016). There is as well indications that university students who suppress the effects of school-related stress are negatively influenced in their academic performance and are more likely to develop school burnout (Seibert et al., 2017).

Aim of the study

The research outlined above highlight the importance of analysing the distinctive contribution of emotion regulation strategies in relation to stress and its impact on stress-related exhaustion in educational settings. Hence, whether the students utilize an adaptive (reappraisal) or maladaptive (suppression) emotion regulation strategy to regulate the various stressors involved in their everyday life, may influence whether they experience stress-related problems of exhaustion or not. As for today, the relationship remains insufficiently explained, and by start to focus on exhaustion in relation to university students may add into the understanding the phenomena. Therefore, the aim of the study is to provide a first insight into whether or not usage of reappraisal or suppression might have an effect on the outcome of stress-related exhaustion. Three main hypotheses are proposed as a starting point for further investigation:

Hypothesis

1. Reappraisal is associated with lower levels of perceived stress and risk of exhaustion, whereas suppression is associated with higher levels of perceived stress and risk of exhaustion.
2. The risk of exhaustion disorder can be predicted by usage of emotion regulation strategy and perceived level of stress. Individuals who use suppression are predicted to have higher scores of exhaustions, compared to individuals who use reappraisal.
3. Perceived level of stress can be predicted by usage of emotion regulation strategy. Individuals who use suppression are predicted to have higher scores in relation to perceived stress, compared to individuals who use reappraisal.

Method

Instruments

Online surveys are a good method for data collection, both on a local and national level. Thus, they offer the advantages of speed, efficiency, and low costs. The survey used in the current study was developed using Qualtrics survey software (www.qualtrics.com), which is a simple web-based tool when collecting data online.

The survey was designed in various blocks (transparent to the participants): with a total of 46 questions. The first block provided the participants with ethical information of the study, confidentiality, an informed consent and contact information. The second block included various sociodemographic questions about the participants studies, residence, economy, and their general health. Thereafter followed three blocks including the instruments measuring the different aspects of the study: that is, the specific emotion regulation strategy most frequently used, whether the individuals were located in the risk zone of exhaustion disorder, and their level of stress

Emotion regulation. The specific strategy of emotion regulation used by the students was measured using the *Emotion Regulation Questionnaire* (ERQ; Gross & John, 2003). The ERQ is a well-established self-report questionnaire, designed to assess individual differences in the habitual use of the two emotion regulation strategies; Expressive suppression and cognitive reappraisal (Gross & John, 2003). Here, participants are asked to rate the extent to which they typically try to think or behave in situations to change their emotions. The ERQ consists of 10 items on a 7-point Likert scale, in which 1 indicate “strongly disagree”, 4 “neutral”, and 7 “strongly agree” (Gross & John, 2003). Cognitive reappraisal has 6 items (1; 3; 5; 7; 8; 10) and expressive suppression has 4 items (2; 4; 6; 9). Here, higher mean score on the subscale indicate that the strategy is more endorsed. The questionnaire has been demonstrated to possess high internal consistent for both the cognitive

reappraisal and expressive suppression subscales. In addition, convergent validity and stability has been demonstrated (Gross & John, 2003). Earlier research by Gross and John (2003) indicated a Cronbach's alpha of $\alpha = .79$ for cognitive reappraisal and $\alpha = .73$ for expressive suppression in a sample of undergraduate students. The ERQ used in the current study is translated to Swedish and published at Stanford University Psychophysiology laboratory (<https://spl.stanford.edu/resources>) – with a reliability of $\alpha = .83$ for reappraisal and $\alpha = .79$ for suppression.

Exhaustion. To assess the risk exhaustion disorder *Karolinska Exhaustion Disorder Scale* (KEDS), developed by a research group at Karolinska institute (Besèr et al., 2014), was used. The scale can distinguish between normal tiredness and stress-related mental exhaustion and is a useful screening tool in both clinical settings and in research. KEDS was constructed and validated against psychiatric screening performed by trained physicians and self-rated symptoms of depression and anxiety (Besèr et al., 2014). The KEDS is originally formulated in Swedish and have been demonstrated to have satisfactory internal consistency with great sensitivity for exhaustion disorder. The scale consists of 9 items on a 6-point Likert scale - with a cut-off score of 19 (total range 0-54) and lower scores indicating no or mild symptoms (Besèr et al., 2014).

Stress. One of the most used psychological instrument for measuring the subjective level of stress is the *Perceived Stress Scale* (PSS; Cohen, Kamarck, & Mermelstein, 1983). The PSS is developed to measure the degree to which situations in one's life are appraised as stressful during the last month. The participants are asked to rate their personal feelings and thoughts associated with how unpredictable, uncontrollable, and overloaded their life are (Cohen et al., 1983). The current study used the 10-item scale, namely the PSS-10 (Cohen et al., 1983). Here, the participants rate their level of identification on a 5-point scale ranging from never (0) to almost always (4). Six questions in the scale are

negative (1; 2; 3; 6; 9,10) and four are positive (4; 5; 7; 8). When scoring, the positive questions are reversed before summing all the ratings together (Cohen et al., 1983). Higher scores indicate more perceived stress and are divided into; low-, moderate- and high- level of stress. The Swedish version of the PSS-10 have demonstrated good internal validity and reliability. Furthermore, it has demonstrated good construct validity with mental/physical exhaustion ($r = .71$) (Nordin, & Nordin, 2013).

Participants

Participants were recruited through convenient sampling, university mailing list, and online advertisement on various platforms. First exclusion criteria included missing entries of data, with 350 of 437 participants completing the online questionnaires. Of those 350 participants, the second exclusion criteria included neurological or treatment of psychiatric disorder (as reported by the participants). Here, 85 participants were under treatment, and 12 participants had a neurological diagnose of some kind. Thereby leaving a total of 253 participants with a mean age of 28.39 SD=7.915.

Statistical Analysis

Statistical analysis was made with IBM SPSS Statistics (version 24.0) and level of significance was set at $p=.05$. Cronbach alpha was calculated for the instruments used; KEDS ($\alpha =.864$), PSS-10 ($\alpha =.886$), ERQ (Suppression $\alpha =.763$; Reappraisal $\alpha =.922$). Demonstrating good internal consistency among the three instruments used.

To be able to find the answer to hypothesis 1 – if there are a relationship between usage of specific emotion regulation strategy (reappraisal and suppression), perceived level of stress and exhaustion scores – Pearson product-moment correlation coefficient was used on the collected data. Thereafter, to be able to answer hypothesis 1 and 2, several regression analyses were carried out to investigate if specific emotion regulation strategy (reappraisal and suppression) and perceived level of stress could predict risk of

exhaustion (hypothesis 2) as well as whether the specific emotion regulation strategy (reappraisal and suppression) could predict perceived level of stress (hypothesis 3) in the sample of university students. In addition, the control questions included in the survey, presented in table 1, will be used as predictor variables in relation to the regression analysis of hypothesis 2 to increase the control of the study.

Table 1. Reported background variables

		N	%
Gender	Female	178	70.4
	Male	75	29.6
Study Degree	Undergraduate	185	73.1
	Postgraduate	68	26.9
Geographical location	Big city (Stockholm, Göteborg, Malmö/Lund, Uppsala)	46	18.2
	City >50000 inhabitants	105	41.5
	Small city <50000	59	23.3
	Countryside	43	17
Moved due to studies	Yes	118	46.6
Accommodation	Like	235	92.9
Perceived health	Very poor	5	2
	Poor	16	6.3
	Fair	82	32.4
	Good	109	43.1
	Excellent	41	16.2
Exercising regularly	Yes	173	68.4
Perceive social support	Yes	226	68.4
Sleep difficulties	Yes	91	36
Perceived workload	Low	12	4.7
	Medium	153	60.5
	High	88	34.8
Enjoy the program	Yes	242	95.7
Engaged in a Union	Yes	97	38.3
Part time job	Yes	139	54.9
Economic worries	Yes	113	44.7

Results

Table 2 demonstrate the variables gathered from the respondents through the three instruments included in the online survey: Use of emotion regulation strategy (ERQ), the participants perceived level of stress (PSS-10), and whether or not they are located in the risk zone of exhaustion disorder (KEDS).

Table 2. Descriptive statistics of the variables measured through the survey.

		N	%
Emotion Regulation Strategy			
	Suppression	76	30
	Reappraisal	177	70
Risk of Exhaustion			
	Yes	211	83,4
	No	42	16,6
Percieved Level of Stress			
	Low	81	32
	Moderate	154	60,9
	High	18	7,1
Total		253	100

Hypothesis 1. Two Pearson product-moment correlation coefficient was computed, one for suppression and one for reappraisal, to assess the relationship between emotion regulation strategy, perceived level of stress and exhaustion.

The analysis indicated a significant negative correlation between reappraisal and exhaustion ($r = -.254, p < .001$) as well as between reappraisal and stress ($r = -.355, p < .001$). There was also a significant positive correlation between suppression and exhaustion ($r = .136, p = .031$) as well as between suppression and stress ($r = .216, p = .001$).

Hypothesis 2. Two multiple regression analyses were carried out, using the ‘enter’ method, to investigate whether perceived stress and emotion regulation strategy could predict risk of exhaustion. Exhaustion were set as the outcome variable and perceived stress

and the specific emotion regulation strategy (reappraisal or suppression) as the predictor variables. The scatterplots of standardized predicted values and standardized residuals, showed that both of the multiple regression analyses met the assumptions of homogeneity of variance and linearity. The residuals were approximately normally distributed and no problems with collinearity were present in the analysis.

For the model based on reappraisal the results of the regression analysis indicated that the model explained 51.7 % of the variance and that the model was a significant predictor of risk of exhaustion, $F(2,250) = 135.918, p < .001$. However, while perceived stress contributed significantly to the model ($\beta = .929, p < .001$), reappraisal did not ($\beta = .016, p = .963$). The final predictive model was: Risk of exhaustion score = $9.824 + (.016 * \text{reappraisal}) + (.929 * \text{perceived stress})$. In addition, by including the background variables into the multiple regression analysis the model instead significantly explained 59.6 % of the variance in the scores of exhaustion, $F(15,237) = 25.74, p < .001$. However, while perceived stress contributed significantly to the model ($\beta = .7, p < .001$), reappraisal did not ($\beta = .033, p = .916$). Only the background variables 'movement due to studies ($\beta = 2.324, p = .003$)', 'economic worries ($\beta = -2, p = .011$)', 'general health ($\beta = -1.89, p < .001$)', and 'sleep difficulties ($\beta = -2.448, p = .002$)' was significant.

For the model based on suppression the results of the regression analysis indicated that the model explained 51.8 % of the variance and that the model was a significant predictor of risk of exhaustion, $F(2,250) = 136.145, p < .001$. However, while perceived stress contributed significantly to the model ($\beta = .934, p < .001$), suppression did not ($\beta = -.146, p = .640$). The final predictive model was: Risk of exhaustion score = $10.316 + (-.146 * \text{suppression}) + (.934 * \text{perceived stress})$. In addition, by including the background variables as independent variables into the multiple regression analysis the model

significantly explained 59.7 % of the variance in the scores of exhaustion, $F(15,237) = 24.3$, $p < .001$. However, while perceived stress contributed significantly to the model ($\beta = .693$, $p < .001$), suppression did not ($\beta = -.033$, $p = .107$). Only the background variables 'movement due to studies ($\beta = 2.265$, $p = .004$)', 'economic worries ($\beta = -1.873$, $p = .019$)', 'general health ($\beta = -1.914$, $p = .001$)', and 'sleep difficulties ($\beta = -2.451$, $p = .002$)' was significant.

Hypothesis 3. Two single regression analyses, using the 'enter' method, were carried out to investigate whether emotion regulation strategy could predict perceived level of stress. Exhaustion were set as the outcome variable and perceived stress as the predictor variable. The scatterplots of the standardized predicted values and standardized residuals, showed that both of the single regression analysis met the assumptions of homogeneity of variance and linearity. The residuals were approximately normally distributed and no problems with collinearity were present in the analysis.

For reappraisal the results of the regression indicated that the model explained 12.6 % of the variance and that the model was a significant predictor of perceived level of stress, $F(1,251) = 36.125$, $p = .001$. The usage of reappraisal as emotion regulation strategy contributed significantly to the model ($\beta = -1.961$, $p = .001$). The final predictive model is: perceived stress levels = $25.819 + (-1.961 * \text{Reappraisal})$. For suppression the results of the regression indicated that the model explained 4.7 % of the variance and that the model was a significant predictor of perceived level of stress, $F(1,251) = 12.284$, $p = .001$. The usage of suppression as emotion regulation strategy contributed significantly to the model ($\beta = 1.171$, $p = .001$). The final predictive model is: perceived stress levels = $13.047 + 1.171 * (\text{Suppression})$.

Discussion

As previous research of the impact of specific emotion regulation strategies have focused on several domains in relation to wellbeing, mental health and performance, studies examining how individuals regulate their emotions in relation to the deleterious effects of chronic stress during their years in school/university is limited (Burić et al., 2016; Seibert et al., 2017). There are no easy answers of the reason for the individual differences in resistance and vulnerability of the negative impact of chronic stress, especially for stress associated with educational settings, as the explanations are numerous. Therefore, main purpose of the study was to help fill this gap as it examined the relationship between risk of exhaustion, level of stress and emotion regulation among university students.

The results of the current study demonstrated that perceived stress and the risk of exhaustion disorder among the university student strongly correlated with the implement of specific emotion regulation strategies. That is, first hypothesis was supported. Reappraisal, the early occurring strategy which intervenes before the emotion response have become fully generated (Gross & John, 2003) demonstrated a negative correlation in relation to both perceived stress and risk of exhaustion disorder among the students. On the other hand, suppression, the strategy that occurs late in the emotion-generative process and mainly modified the behavioral aspects (Gross & John, 2003) demonstrated a positive correlation in relation to perceived stress and risk of exhaustion disorder. Specifically, a negative correlation indicates that habitually usage of reappraisal buffer against the negative aspects of stress as well as decreasing the risk of exhaustion disorder. Whereas a positive correlation in relation to suppression resulted in heightened levels of perceived stress and increased the risk of exhaustion disorder among the university students. Interestingly, the result of the regression analysis examining whether perceived stress and usage of specific emotion regulation strategy could predict risk of exhaustion demonstrated that, even though both of the models explained over 50% of the variance, only perceived level of stress contributed significantly to the two

models – the second hypothesis partly supported by the results. However, habitual usage of both reappraisal and suppression could predict perceived stress levels among the students: with reappraisal explaining 12.6 % and suppression explaining 4.7 % of the variance – third hypothesis supported. The results indicate that emotion regulation strategy does influence individuals stress levels, and therefore may have an indirect effect on risk of exhaustion.

Stress-related exhaustion is a significant medical problem affecting people exposed to chronically heightened stress levels (Besè et al., 2014; Glise et al., 2014; Maslach & Leiter, 2016; Socialstyrelsen, 2003). Therefore, the results from the current study should be taken seriously as exhaustion or even school burnout can have a major influence later on in life. Without successful recovery or coping, the individuals, their relatives and the society will pay a high cost for the problems (Almén, 2017; Försäkringskassan, 2016; Socialstyrelsen, 2017), as the problems may go unnoticed and follow the entry into work life. From the results one can see that from the first exclusion criteria of the online questionnaire (N=350) 24.3 % of the students were already under treatment of some kind of mental illness, and yet from the remaining respondents as high as 83.4 % of the students were in the risk zone of exhaustion disorder – demonstrating a large prevalence of hidden statistics.

The years in education have an important impact on individuals, as it involves both risk- and protective- factors associated with individuals wellbeing and mental health (Korhonen et al., 2014) and to be able to intervene before stress-related strains develop into more severe forms of mental health issues is in need. Hence, school nurses and overly booked school counselling services have reported a massive increase of students reporting stress-related problems (Folkhälsomyndigheten, 2016). Most often, individuals seek health care for one stress-related symptom only, for example somatic pain, dizziness or gastrointestinal discomfort (Glise et al., 2014). Therefore, there is a need for school nurses and counsellors to check for the presence of multiple stress-related symptoms in the students. Thus, it is of

greatest importance to not overlook the various predictors of stress-related symptoms and thereby increasing the possibility of preventing the development of more severe stress-related conditions such as disorder, especially in the younger ages. The results of the study indicated that reported sleep difficulties were a significant predictor for risk of exhaustion, which goes in line with previous suggestions, arguing that a failure to properly recover may be a central factor in the development of exhaustion disorder (Born et al., 1997; Besér et al., 2014; Socialstyrelsen, 2003). In addition, the fact that general health reported by the students also did demonstrate to predict risk of exhaustion, suggest that individuals may indeed recognise the stress-related strains and the various problematic health issues involved – even though individuals more often seek medical help for single symptoms only (Glise et al., 2014). The other two predictors – ‘economic worries’ and ‘moving’ – are more related to the years of university, as the emotional impact of moving away from people, places and experiences as well as financial stress associated with living on a tight budget can be a rather stressful transition for the individuals. Consequently, affecting the individual’s health and wellbeing accordingly.

On the good note, the alternatives of how the educational settings can promote positivity and reduce the stress-related strain on the students are numerous. To establish the effects of specific emotion regulation strategies, namely reappraisal and suppression, as a precursor may be of great implication for school psychologists, counsellors, and educators alike (Seibert et al., 2017). Because the brain is the central target of stress, as the mind and body are tightly linked, it is also one of the primary targets for interventions to reduce the negative effects of chronic stress and increase the use of successful emotion regulation strategies (Gross, 2014; McEwen, 2007). In line with this, brain centred interventions by means of change are often used in everyday life, such as improving sleep quality, social support, maintaining a healthy diet and moderate physical activity (Almén, 2017). However,

as simple as the solutions sounds, changing the behaviour or better cope with stress-related feelings of strain in school, work or everyday life is often difficult. Instead individuals devote considerable resources and time in reducing stress by means of regulatory behaviours, processes that do not change the stressful experiences, only provide an escape from the stressors. Finding the changes needed may require the help on the personal level. By incorporating interventions and sessions in educational settings aimed at informing and increasing use of reappraisal and decrease suppression can be greatly beneficial for students who suffer from school-related stress and feelings of strain. Therefore, improving individual's reappraisal skills may contribute to better change the meaning of the physiological responses, decrease arousal or increase their acceptance. It may as well be of importance to inform the individuals about the adaptive functions of the biological stress-responses as the processes involved not always result in maladaptive outcomes.

Although the results of the study are preliminary and further verification in future studies is desirable, they can be seen as important for incorporating a heightened focus on emotion regulation in relation to educational settings and stress-related exhaustion. Thereby, also the possibility to put forth interventions prior to development of the more severe consequences of chronic stress and decrease the heavy weight on the society.

Limitations and Future Studies

The research of the impact of suppression and reappraisal in relation to students and stress-related exhaustion are limited, but the results of the present study demonstrate a high rate of individuals located in the risk of exhaustion during the period of university. As the study gave a good insight into the hidden statistics in relation to the stress-related exhaustion among the students, an important domain for future research would be to investigate the factors presented in the current paper during the earlier years in school as well. In addition, the fact that the hypothesis of a direct impact of emotion regulation strategy on

the risk of exhaustion were not supported in the current study could be due to the sample were too small. That is, the sample could be arguing to be quite small when considering the large geographical distribution of the students. Therefore, a particular fruitful avenue would be to investigate the factors presented in the current paper by following a bigger sample of students across the population during their years in school. Thus, a longitudinal study would provide better control in relation to confounders which might have an impact on the result. Although the instruments used in the study presented in the paper had good reliability and validity, important to highlight is that a conducting a survey-based study include several pros-and-conses. First off, the respondents may quit in the middle of the survey or give inaccurate answers (response bias). But, as surveys tend to be the most cost-effective ways of research and easily can gather a large amount of data with a wide reach, for the study in mind, online were the best option.

Another important domain for future studies is to find a model of explanation of the findings presented in the current paper, as there are reasons for future studies of the interaction effects. More specifically, finding a model of explanation of the impact of using adaptive or maladaptive emotion regulation strategies on stress-related exhaustion, as it may contribute to better and more successful interventions before the chronic levels of stress develop into more severe stress-related disorder. In addition, as the current study looked at whether the individuals were located in the risk zone of exhaustion disorder or not, using instrument that measure the degree of exhaustion may provide a better understanding of the phenomenon. Also, a more in-depth study following the diagnostic criteria of exhaustion disorder as proposed by the ICD-10 (World Health Organization, 1992; Socialstyrelsen, 2003) may provide an even better understanding. Furthermore, to focusing on including interventions (i.e mindfulness) aimed to reduce the negative outcome of stress-related strains in future could provide a good contribution for non-clinical groups reporting high amount of

school-related stress and strains (Folkhälsomyndigheten, 2016; Salmela-Aro et al., 2008; Salmela-Aro et al., 2009; Uppsala Studentkår, 2017).

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