Heli Kiema-Junes

ASSOCIATIONS OF SOCIAL SKILLS AND SOCIAL SUPPORT WITH WELL-BEING-RELATED OUTCOMES AT WORK AND IN HIGHER EDUCATION

HEART RATE VARIABILITY, ENGAGEMENT, AND BURNOUT

UNIVERSITY OF OULU GRADUATE SCHOOL; UNIVERSITY OF OULU, FACULTY OF EDUCATION
HELI KIEMA-JUNES

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Heart rate variability, engagement, and burnout

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Abstract
This study examined the quality of social interaction with respect to well-being at work and in higher education. Study I examined the association between student counselors’ interpersonal skills and clients’ emotions indicated by heart rate variability. Study II investigated the role of social skills in engagement and burnout among university students. Study III researched the role of social support at work and in private life for work engagement in middle age.

Study I was executed in a laboratory setting with students in a counseling psychology course forming ten counselor-client pairs. Counseling skills were measured by video-based analysis, and heart rate variability was assessed in clients using a heart rate monitoring system. Participants in Study II were university students (n = 351) who answered a questionnaire about social skills, study engagement, and study burnout. Study III utilized participants (n = 5,259–5,376) from the Northern Finland birth cohort 1966 study. We used a 46-year follow-up study in our analyses of social support and work engagement.

The results revealed that counseling skills were associated with clients’ increased heart rate variability in Study I. Increased heart rate variability reflects the parasympathetic activity of the autonomic nervous system (ANS), which indicates relaxation. Study II showed that social skills were associated with increased engagement and decreased burnout among university students. Higher engagement was also associated with lower burnout. In Study III, results revealed that higher social support at work and in one’s private life was associated with higher work engagement.

This research implies that social skills and social support might act as significant resources for emotional well-being and the development of both work and study-related engagement. Moreover, social skills and social support may buffer the risk of burnout. However, since the study was cross-sectional, causal inferences cannot be made. Further studies are needed to examine whether social support and enhanced social skills can increase engagement and decrease burnout at work and in higher education.

Keywords: counseling skills, emotions, heart rate variability, job burnout, social interaction, social skills, social support, university students, work engagement
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Tiivistelmä


Tulokset osoittivat ohjaustaitojen olevan yhteydessä asiakkaan korkeampaan sykevälivaihteluun. Onnistuneen ohjauksen aikana asiakas rentoutui, mikä näytyi korkeampaan sykevälivaihteluteen ja parasympaattiseen aktiiviseen tilaan hermostossa. Tutkimustulokset esittivät, että vuorovaikutustaitoja on hyödyntää työmarkkinoilla ja sosiaalisen tukin käytännössä. Sosiaalinen tuki näyttää olevan yhteydessä työn imun kokemiseen.


Asiakirjat: vuorovaikutustaitoja, sosiaalinen tuki, työmarkkinoiden työhyvinvointia.
Oliverille ja Juliukkelle
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September 2020

Heli Kiema-Junes
**Abbreviations**

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<tbody>
<tr>
<td>ANS</td>
<td>Autonomic Nervous System</td>
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<td>CROS</td>
<td>Counselor Response Observation System</td>
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<tr>
<td>ERI</td>
<td>Effort-Reward Imbalance</td>
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<tr>
<td>HF</td>
<td>High Frequency</td>
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<td>HRV</td>
<td>Heart Rate Variability</td>
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<td>LF</td>
<td>Low Frequency</td>
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<td>SSQ</td>
<td>Social Support Questionnaire</td>
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<td>SVRS</td>
<td>Skilled Verbal Response Scale</td>
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List of original publications

This thesis is based on the following publications, which are referred throughout the text by their Roman numerals:


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1 Introduction

In this chapter, the role of social interaction for people’s lives and well-being is described. In the following sub-chapters, the concepts of occupational well-being and engagement at work and in higher education are defined as well as the opposite dimensions of occupational stress and burnout at work and in higher education are conceptualized. Physiological aspects of emotions in occupational well-being are covered further on in the introduction chapter. The dimensions of social interaction such as counseling skills, social skills and social support are conceptualized. In the last chapter, the role of social interaction for occupational well-being and ill-being is summarized. As a conclusion of introduction chapter, the need for further studies is presented.

1.1 The role of social interaction in people’s lives

Social relationships and social interaction play a significant role in people’s lives and can optimally provide opportunities to fulfill basic psychological needs, such as the sense of belonging and attachment (Deci & Ryan, 1985). Most people—58% of the world’s population—spend one-third of their adult life at work (World Health Organization, 1994), and paid employment has a great impact on individuals’ well-being (Warr, 1999). Educational institutions and student life also cover a considerable amount of people’s lives and have various impacts on well-being as well. Psychological well-being at work and in study circumstances can be referred to as occupational well-being, and is constituted by affective, motivational, cognitive, and psychosomatic dimensions of work or study (Van Horn, Taris, Schaufeli & Schreurs, 2004). Occupational well-being has many positive outcomes for both individual well-being and work organizations and educational institutions (Breso, Schaufeli & Leiter, 2010; Harter, Hayes & Schmidt, 2002). Correspondingly, ill-being presents major costs to an organization; job burnout is linked to increased sickness absenteeism (Bakker, Demerouti, De Boer & Schaufeli, 2003).

Contemporary work life offers employees several possibilities to develop their own skills and competences and achieve a sense of meaningfulness at work (Jiang & Johnson, 2018). At the same time, mental demands at work are expanding and have a cost, increasing occupational stress and even the risk of job burnout (Maslach, Schaufeli & Leiter, 2001; Siegrist et al., 2004). Further, work-related stress is estimated to be the second-largest health related problem after back pain.
in the working environment, and around half of European employees consider stress common in their workplace (European Agency for Safety and Health at Work, 2019). The educational environment is also a demanding context, as students aim to achieve a degree and try to cope with deadlines and courses (Misra, McKeen, West & Russo, 2000; Schaufeli et al., 2002) while many students are working at the same time (Hodgson & Spours, 2001). Moreover, contemporary work and educational organizations need engaged employees and students for proactivity and optimal performance (Bakker & Leiter, 2010). Work engagement (Bakker & Leiter, 2010) stems from positive psychology, which has attracted increasing interest in recent years (Seligman & Csikszentmihalyi, 2000). Work engagement is understood as a positive emotional and motivational state at work (Schaufeli, Salanova, Gonzales-Roma & Bakker, 2002b).

Social relationships and social interaction are closely associated with basic psychological demands, such as relatedness (Deci & Ryan, 1985). These basic psychological needs such as competence, autonomy, and relatedness (Deci & Ryan, 2000) form the cornerstones of psychological health and well-being (Kashdan & Rottenberg, 2010). Research indicates that one essential factor of happiness is rich and satisfying relationships, and it can be conjectured that good social relationships are universally important to human mood (Diener & Seligman, 2002). Social skills and social support are also key factors at work and in higher education in terms of job and academic performance and well-being (Bakker & Demerouti, 2007a; Halbesleben & Buckley, 2004; Taylor, 2011).

Well-being is more than just the absence of ill-being or unwell-being (Keyes, 2002; Seligman, 2002), and it is common for an individual to show high levels of both ill-being and well-being (Keyes, 2002). Some individuals lack meaningful lives, even though they do not suffer from psychological ill-being or disorders (Ryff et al., 2006). Both ill-being and well-being should be regarded on their own; how to prevent ill-being should be studied, as should how to enhance well-being. This study regards work engagement as an indicator of occupational and study-related well-being (Leiter & Bakker, 2010) and burnout as an indicator of occupational and study-related ill-being (Demerouti, Bakker, Nachreiner & Schaufeli, 2001). Burnout is defined in literature as a prolonged response to chronic emotional and interpersonal stressors at work (Maslach, Schaufeli & Leiter, 2001). Work- and study-related engagement and burnout act as opposite dimensions and are negatively associated, but they act as distinctive processes and should be examined on their own (Schaufeli et al., 2002a, 2002b).
As we have described here, employees and students experience stress in today’s mentally demanding occupational life, and research suggests that social relationships may act as potential resources in buffering stress and increasing well-being (e.g., Segrin & Taylor, 2007). The role of specific social skills for engagement has hardly been investigated yet. Only one study conducted among medical residents has examined the association between social skills and burnout (Pereira-Lima & Loureiro, 2015), so further studies are needed. Heart rate variability (HRV) has been researched previously related to psychological well-being (e.g., Appelhans & Luecken, 2006), but in terms of counseling or social skills, it has not been investigated yet. This study aims to examine 1) the association between counseling skills of the counselors and clients’ HRV, 2) the role of social skills for both engagement and burnout among university students, and 3) the role of various dimensions of social support for work engagement and whether work stress modifies the association between social support and work engagement.

### 1.2 Occupational well-being and ill-being: Conceptualization

In psychological literature, there are several ways of defining the multidimensional concept of well-being. A subjective point of view towards well-being is often construed as an affective state of well-being (Diener, Suh, Lucas & Smith, 1999). The concept of subjective well-being includes people’s emotional responses, domain satisfaction, and global judgements of life satisfaction (Diener et al., 1999). Ryff and Keyes (1995) propose a theoretical structure of psychological well-being that is based on theories of life course development, clinical accounts of positive functioning, and conceptions of mental health. Psychological well-being is characterized in Ryff and Keyes’ (1995) model by self-acceptance, environmental mastery, purpose in life, positive relationships with others, and by possibility for personal growth and acceptance, which comes close to basic psychological needs (Deci & Ryan, 1985). Ryff and Singer (1998) propose an explicit formulation of positive well-being being not only “absence of illness,” and defining well-being based on philosophical principles instead of medical considerations. Psychological well-being is a dynamic process rather than an attained goal (Ryff & Singer, 1998).

Well-being can also be conceptualized by hedonic and eudemonic aspects of well-being (Deci & Ryan, 2008). The hedonic approach to well-being concentrates on happiness, pleasure attainment, and pain avoidance while the eudemonic approach refers to meaning, self-realization, and one’s personal functioning (Deci & Ryan, 2008). Psychological well-being can also be characterized as flourishing,
which indicates having positive emotions and acting socially and psychologically flexible (Keyes, 2002). Flourishing people have positive emotions and experiences in various areas of life (Keyes, 2002, 2007). The emotion-based approach to well-being is also described in Warr’s (1999) model that identifies subjective well-being at work by feelings from displeasure to pleasure, from anxiety to comfort, and from depression to enthusiasm.

Recently, the focus within research has been shifting from negative psychological disorders to positive well-being and human strengths (Seligman & Csikszentmihalyi, 2000). The background extends to the salutogenesis approach that focuses on supporting health and well-being instead of illness and diseases (Antonovsky, 1987). Stress and adversity are normal parts of human life and the model seeks the strength and strategies that maintain psychological health and well-being (Antonovsky, 1987), which can also be seen in the concept of resilience (Leipold & Greve, 2009). Resilience is originally derived from trauma psychology, explaining how people can cope with trauma and stress (Bonanno, 2008) and in the occupational field the concept is been defined as the ability to recover quickly after adversities at work (Luthans, 2002). Positive occupational psychology examines the strengths, resources, and opportunities of work organizations and what makes a job meaningful and rewarding (Schaufeli et al., 2002b).

Psychological well-being related to work and occupation is associated with concepts such as occupational well-being and well-being at work or employee well-being (Van Horn, Taris, Schaufeli & Schreurs, 2004). Occupational well-being is often conceptualized by affective state, indicating, for example, job satisfaction, commitment, or work-related depressive feelings (Diener et al., 1999). Warr (1999) conceptualizes occupational well-being by emotions and feelings aroused at work. When one is feeling pleasure and enthusiasm at work, it can result in the experience of work engagement, and when one is feeling comfort and pleasure, it refers more to job satisfaction (Warr, 1999; Schaufeli et al., 2002b). Furthermore, feeling displeasure, anxiety, and depression may lead to the risk of job burnout (Schaufeli et al., 2002b; Warr, 1999).

Job burnout shifts the focus from occupational well-being to occupational ill-being, which is mostly characterized by occupational stress and burnout. Occupational stress is conceptualized by Lazarus (1991) as a complex process that is divided into three dimensions: 1) sources that create stress in the work environment, 2) employees’ perception and appraisal of a stressor at work, and 3) the emotional reactions that are evoked in a stressful situation when one’s individual needs are threatened. Job burnout is a prolonged response to
occupational stress (Maslach, Schaufeli & Leiter, 2001). Job burnout is conceptualized more precisely in Sub-chapter 1.1.2. Low levels of well-being can also be connected to negative emotions and Keyes (2002) uses the term languishing to describe a mental state where one is not experiencing positive emotions and is not feeling socially or psychologically well but is still not suffering from depression or other mental illnesses. Psychological ill-being and well-being are considered separate, independent dimensions of psychological functioning indicating that not having symptoms of ill-being or burnout does not mean that one is experiencing well-being (Ryff et al., 2006). Likewise, job burnout and work engagement are negatively correlated but act as independent processes (Schaufeli & Bakker, 2004).

Beyond all the different definitions of subjective well-being in the occupational context, Van Horn, Taris, Schaufeli, and Schreurs (2004) present a multidimensional concept of occupational well-being through their large data set of Dutch teachers that offers a comprehensive theoretical frame for occupational well-being. Van Horn et al. (2004) divide occupational well-being into five dimensions: affective, professional, social, cognitive, and psychosomatic. The affective dimension reflects emotions aroused at work, and the dimension also combines job satisfaction and organizational commitment (Van Horn et al., 2004). The dimension of professional well-being includes autonomy, aspiration, and professional commitment, and it is closely related to job-related motivation (Van Horn et al., 2004). The social well-being dimension of occupational well-being is presented in Van Horn et al.’s (2004) model through two types of concepts—negative and positive. Negative concepts relate to depersonalization, such as negative attitudes towards co-employees, and positive concepts reflect positive relationships and the level at which one operates well in social relationships at work (Van Horn et al., 2004). The cognitive dimension specifically indicates cognitive weariness, which is developed as equivalent to the concept of emotional exhaustion (Van Horn et al., 2004). The term emotional exhaustion refers to work-related fatigue, while cognitive weariness relates more to cognitive ability and functioning (Van Horn et al., 2004).

Cognitive weariness is presented as the degree to which an employee is able to work cognitively and, for example, able to take in new information (Van Horn et al., 2004). Emotional exhaustion was originally introduced by Maslach (1993). Finally, the psychosomatic dimension of the model is presented as the presence or absence of psychosomatic symptoms (Van Horn et al., 2004). Occupational well-being should be considered not only by the dimensions of stress and fatigue or the opposite dimension of job satisfaction, but any intervention should promote all the
cognitive, motivational, affective, and health aspects of occupational well-being (Van Horn et al., 2004).

Occupational well-being is divided more specifically in this study into occupational well-being and occupational ill-being in terms of work engagement and job burnout. This study aims to investigate the role counseling skills for a client’s heart rate variability, the role of social skills for engagement and burnout among university students, and the role of various dimensions of social support for work engagement. Study III also examines whether work stress modifies the association between social support and work engagement.

1.2.1 Job demands and resources in occupational stress

Among employee well-being research and job stress models (Karasek, 1979; Siegrist, 1996), the Job Demands-Resources model (JD-R) compiles both negative and positive indicators of employee well-being and is applicable to a wide range of occupations by the specificity of different kinds of job demands and resources. The model is also suitable for both employee well-being and performance improvement (Bakker & Demerouti, 2007).

The Job Demands-Resources model (JD-R) (Bakker, Demerouti, De Boer & Schaufeli, 2003b; Demerouti, Bakker, Nachreiner & Schaufeli, 2001) comprises two processes of an energy-depleting or stress process and motivational process. The motivational process describes job resources that help employees to cope with demands and work stress, and eventually enables flourishing work engagement and increasing organizational commitment (Demerouti et al., 2001). Controversially, the stress process explains how heavy job demands can cause wearing out, eventually exhausting energy and leading to burnout (Demerouti et al., 2001). Job demands can be identified as physical, psychological, social, and organizational requirements for the employee, such as high work pressure, emotional demands, or role ambiguity (Bakker & Demerouti, 2007a). When prolonged and without the possibility for recovery, the job demands can develop into job burnout and, further on, impaired health and decreased work ability (Bakker & Demerouti, 2007a; Halbesleben & Buckley, 2004).

Besides job demands, employee motivation and well-being can be promoted by different types of job resources (Demerouti, Bakker, Nachreiner & Schaufeli, 2001) that refer to the physical, psychological, social, or organizational factors of the job, such as social support, performance feedback, and autonomy, that increase the possibility for employees to achieve work goals and decrease job stress and
demands (Bakker & Demerouti, 2007a; Salanova, Agut & Peiró, 2005). Job resources are shown to stimulate personal growth, learning, and development, and increase the possibility of experiencing work engagement (Bakker & Demerouti, 2007a). Further, job resources promote the willingness to continue at the same workplace and decrease turnover (Schaufeli & Bakker, 2004). Besides job resources, individual resources like an optimistic attitude and recovery can increase the level of work engagement experienced (Hakanen & Lindbohm, 2008; Ten Brummelhuis, Bakker & Euwema, 2010). Personal resources represent aspects of the self that are related to resiliency and imply an ability to control and impact the environment successfully (Xanthopoulou, Bakker, Demerouti & Schaufeli, 2007). Xanthopoulou et al. (2007) name as typical personal resources self-efficacy, organizational-based self-esteem, and optimism. Moreover, self-efficacy (Bandura, 1986), meaning one’s belief in one’s own abilities to succeed in a given work task, has been shown to explain how job resources support and lead to work engagement (Xanthopoulou et al., 2009). It is worth acknowledging that the match between job demands and resources is important in order to have the stress-buffering effect (De Jonge, Demerouti & Dormann, 2014). Job resources do not automatically provide stress release; De Jonge et al. (2014) give an example of a match between demand and resource wherein a nurse who must lift heavy patients will possibly benefit more from an automatic bed than from emotional support from a colleague.

Additionally, colleagues’ (Hakanen & Lindbohm, 2008) and even spouses’ (Bakker & Demerouti, 2009) work engagement can have a crossover influence on one’s work engagement. Hakanen & Perhoniemi (2013) call for friendly and polite behavior at workplaces that enhance well-being and can lead to a crossover influence on work engagement. Besides friendly behavior, job resources, such as learning opportunities, social support, social resources, and clarified work goals, are worth acknowledging for how they strengthen the possibility of experiencing work engagement and spreading work engagement between people (Hakanen & Perhoniemi, 2013). A longitudinal study of 1,709 adolescents showed that the demands-resources model of the energy-depleting and motivational processes can also be applied to the school and study context (Salmela-Aro & Upadyaya, 2014). Salmela-Aro and Read (2017) also confirmed that the JD-R model applies to higher education students in their study of 12,394 students. The study supported that higher demands and lower resources were related to lower engagement and higher risk of burnout (Salmela-Aro & Read, 2017).
1.2.2 Work and study related ill-being: Burnout

An experimental dimension of psychological ill-being can also be demonstrated with the concept of job burnout, referring to “a prolonged response to chronic emotional and interpersonal stressors on the job” (Maslach et al., 2001, p. 397). Job burnout has its roots in 1970s research dealing with the experiences of people who worked in the human services and health care sectors, where people’s goal is to provide aid and service to people in need, yet they face a lot of emotional and interpersonal stressors (Maslach et al., 2001). The burnout concept did not have a standardized definition at first, but along with the research, the core dimensions were established and the development of a multidimensional theory of burnout began (Maslach et al., 2001).

The multidimensional theory distinguishes burnout as prolonged emotional and interpersonal stress that is divided into three dimensions of exhaustion, cynicism, and inefficacy (Maslach et al., 2001). Exhaustion reflects the stress dimension of burnout and is characterized as the feeling of being emotionally exhausted from work (Maslach et al., 2001). People use cognitive distancing by developing a cynical attitude against work when they experience exhaustion (Maslach et al., 2001). A cynical attitude is also related to depersonalization, which is an attempt to have distance between oneself and one’s work tasks (Maslach et al., 2001). First being emotionally exhausted by heavy workload and stress, people develop a cynical attitude that eventually leads to the feeling of inefficacy in one’s work and the experience of low professional efficacy in both social and non-social aspects of professional accomplishment (Schaufeli & Bakker, 2004).

There are situational factors influencing the development of job burnout that can be divided into job, occupational, organizational, and personal factors (Maslach et al., 2001). Job characteristics refer to quantitative and qualitative demands experienced at work, such as workload and time pressure and role conflict or role ambiguity (Maslach et al., 2001). The occupational aspect of job burnout is related to occupations that include working intensively with other people, as in caregiving or teaching. Later research also focused on occupations that included interaction with people, but more extensive relationships, as in managerial roles (Maslach et al., 2001). Further research focused on occupations that include less contact with other people, such as computer programmers (Maslach et al., 2001). Organizational factors include hierarchies, operating rules, resources, and even space distribution (Maslach et al., 2001). Organizational context can be understood as the larger social, cultural, and economic picture (Maslach et al., 2001). Last, personal factors are
divided into demographic variables (age, education), personality characteristics, and work-related attitudes (Maslach et al., 2001). Meta-analysis indicates that age and work settings are related to exhaustion and depersonalization of individual and work-related factors (Lim, Kim, Kim, Yang & Lee, 2010). Age and work hours were associated with personal accomplishment (Lim et al., 2010). Overall, situational factors have a significant influence on the development of job burnout.

Maslach et al. (2001) proposed that the significance of job burnout lies in its outcomes. Job burnout is associated with physical illness and low mental health (Honkonen et al., 2000). In the work environment, burnout outcomes are related to lower job satisfaction (Maslach, Jackson & Leiter, 1996) and job performance, such as lower production and performance (Maslach & Leiter, 2001) and increased turnover (Scanlan & Still, 2019; Schaufeli & Bakker, 2004). Even though the negative impact of burnout has been widely recognized on both employees and organizations (Maslach et al., 2001; Ochoa, 2018), employees are still struggling to avoid burnout in today’s highly competitive and mentally heavy work life (Luther et al., 2006).

Job burnout also extends to study environments, and in this study, burnout in higher education is conceived as study-related burnout. A longitudinal study shows that study-related burnout can predict depression in later adulthood (Salmela-Aro & Updyaya, 2014), so it is an important topic to examine. Study-related burnout arises from feelings such as fatigue and strain about study work (Salmela-Aro, Savolainen & Holopainen, 2009). Prolonged strain and stress can cause cynical attitudes, which eventually result in a loss of interest in study work (Salmela-Aro et al., 2009). The concept of burnout is generally defined as work-related disorder, but the concept of burnout is also applicable in education, as the school is a context or place in which students work as they are attending courses and classes, writing and carrying out different essays and assignments and passing exams (Bask & Salmela-Aro, 2012). Burnout among students is presented as school burnout, student burnout, and study or study-related burnout that comprises three distinctive dimensions like job burnout, exhaustion, inefficacy, and cynicism (Salmela-Aro, 2009; Schaufeli et al., 2002a). Emotional exhaustion connotes the experience of being physically and emotionally drained and depleted from study work and cynicism relates to a cynical attitude towards study work, whereas inefficacy refers to the feeling of inadequacy (Maslach & Leiter, 2005).

Burnout among students influences various dimensions of student life and well-being. Burnout impairs academic achievement (Galbreith & Merril, 2015) and academic and performance-based self-esteem (Dahlin, Juneborg & Runeson, 2007;
Excessive demands in study work can cause too much pressure and stress for students (Bask & Salmela-Aro, 2012). Eventually, burnout, especially a cynical attitude, can lead to dropping out (Bask & Salmela-Aro, 2012). One important reason for stress and pressure among students is related to imbalance between study work and paid jobs, which causes stress and overly high performance-related goals for students (Salmela-Aro & Kuntsu, 2010; Schouwenburg, 2004).

Burnout among students is an important issue to be regarded as it has many negative consequences for students, such as negative psychosocial outcomes (Salmela-Aro et al., 2009), and for educational institutions, such as low academic performance and outcomes (Schaufeli et al., 2002a). Burnout among students also predicts difficulties in the transition to work life (Robin, Roberts & Sarris, 2018) and in general well-being in later life (Salmela-Aro & Upadyaya, 2014).

1.3 Occupational well-being: Work engagement

As an antecedent of ill health in psychological research, positive psychology suggests focusing on human strengths and positive well-being (Seligman & Csikszentmihalyi, 2000) such as work engagement. Work engagement can be regarded as an indicator of occupational well-being. Work engagement is closely related to occupational well-being, as work engagement describes positive experiences at work and acts as an antipode to job burnout (Bakker, Schaufeli, Leiter & Taris, 2008). Work engagement comprises three dimensions of well-being: vigor, dedication, and absorption (Schaufeli et al., 2002b). Vigor denotes high levels of energy, high mental resilience and persistence while working (Schaufeli et al., 2002b). Dedication is characterized by enthusiasm, a sense of significance, and having a strong involvement in one’s work (Schaufeli et al., 2002b). Absorption indicates full concentration and being engrossed in one’s work (Schaufeli et al., 2002b). High levels of pleasure and enthusiasm can be characterized as flourishing and work engagement (Schaufeli et al., 2002b).

Originally, work engagement is derived from the role theory concept of “psychological presence” (being fully there) that describes the experiential state enabling organization members to express themselves physically, cognitively, and emotionally (Kahn, 1992). Later, Maslach and Leiter (1997) proposed that engagement is defined as energy, involvement, and efficacy as opposed to the burnout dimensions of exhaustion, cynicism, and lack of professional efficacy. Theoretical analysis revealed two underlying dimensions characterized as work-
related well-being: activation from exhaustion to vigor, and identification from
cynicism to dedication (Schaufeli & Bakker, 2001).

Among theoretical and empirical research, the concept of work engagement
comes into focus as a positive, fulfilling, emotional and motivational work-related
state of mind (Schaufeli et al., 2002b). Work engagement seems to make employees
highly energetic and enhance the possibility of experiencing high self-efficacy
(Bakker, Albrecht & Leiter, 2011). Employees experiencing work engagement are
also shown to be succeeding and performing well at work (Bakker & Bal, 2010; 
Bakker, Tims & Derks, 2012; Kasparkova et al., 2018). One reason for employee
performance may be linked to stress coping, as research indicates that engaged
employees cope well with stressors at work (Sonnenstag, Mojza, Demerouti & 
Bakker, 2012). Engaged employees are also shown to express job satisfaction and
enjoyment at work (Bakker, Schaufeli, Leiter & Taris, 2008). Personal initiative is
also positively linked to work engagement, as Hakanen, Perhoniemi and Toppinen-
Tanner (2008) demonstrated by a structural equation model in which job resources
related to a given task were associated with work engagement, and work
engagement predicted personal initiative. Along with this, personal initiative
seemed to flourish with work engagement, and they created a positive spiral to job
resources (Hakanen et al., 2008).

Furthermore, work engagement has been linked to the proactivity of employees
and job-crafting activities, which are shown to increase work engagement
(Hakanen, Perhoniemi & Toppinen-Tanner, 2008; Tims, Bakker & Derks, 2015).
Job crafting refers to redesigning and shaping a job to be more meaningful for
oneself (Wrzesniewski & Dutton, 2001). Bakker et al. (2012) demonstrated that
proactive personality was associated with job crafting, which increased the
experience of work engagement. Employees can redesign and shape working
methods, work tasks, or even their own perceptions of work (Wrzesniewski &
Dutton, 2001), and job crafting has been shown to increase work engagement
(Bakker, Rodriguez-Muno & Vergel, 2015).

Work engagement is vital for organizations because it is linked to important
indicators of organizational productivity (Harter, Schmidt & Hayes, 2002) such as
employees’ organizational commitment (Kim et al., 2017), reduced turnover
intentions (Simpson, 2009), and organizational productivity (Harter et al., 2002).
Work engagement is also linked to physical health, as prior findings suggest that
work engagement is connected to healthy and adaptable cardiac autonomic activity,
especially increased parasympathetic activity measured with HRV (Seppälä et al.,
2011). Among all these positive outcomes of work engagement, it is even more
important to examine the possible resources, such as social support and social interaction, that could act as potential resources for work engagement.

1.4 Well-being in higher education: Study engagement

From engagement at work, the concept of engagement at work extends to cover the state of well-being in studying environment; this study concentrates on higher education. Research about study-related engagement has introduced interesting outcomes such as student motivation and success (Fredricks, Blumenfeld & Paris, 2004). The research also suggests that study-related engagement can even prevent school dropout (Archambault, Janosz, Morizot & Pagani, 2009), which draws attention to the concept in literature.

Alrashidi, Phan, and Ngu (2016) have compiled and present different definitions of engagement in literature such as engagement, student engagement, study engagement, education engagement, student engagement at school, and student engagement in academic work. Engagement can also be understood from a variety of approaches such as behavioral, emotional, cognitive, psychological, and academic approaches (Updaya & Salmela-Aro, 2013). The behavioral aspect of engagement refers to involvement at school or in studies, and the emotional aspect is related to interest, identification, belonging, and a positive attitude about learning (Appleton, Christensen & Furlong, 2008). The emotional or affective component is closely linked with academic emotions that are widely researched in terms of motivation and engagement (Pekrun & Linnenbrink-Garcia, 2012). The cognitive aspect of engagement includes self-regulation, setting learning goals, and investing in learning (Appleton et al., 2008). Psychological engagement illustrates a sense of belonging and relatedness, and identification with a school or educational institution (Appleton et al., 2008) and, finally, academic engagement is conceptualized as the extent to which students are motivated to learn or succeed in school (Libby, 2004).

The concept of student engagement is derived from work engagement because of the closeness between concepts (Schaufeli et al., 2002a; Upadyaya & Salmela-Aro, 2013) and approaches the psychological and motivational aspect of study engagement (Upadyaya & Salmela-Aro, 2013). Study engagement is characterized by three different dimensions, like work engagement: vigor, dedication, and absorption (Schaufeli et al., 2002a). Vigor refers to high levels of energy and mental resilience while studying, dedication refers to a sense of significance, inspiration, and pride about one’s study work, and absorption is related to concentration and
being happily engrossed with study work (Schaufeli et al., 2002a). Engagement among students is related to a variety of positive outcomes, such as increased academic performance (Breso et al., 2010; Vizoso, 2018) and study motivation (Cazan, 2015; Stoeber, Bilgs, Hayward & Feast, 2011). Engagement is also shown to be associated with students’ higher self-esteem (Forsyth, Lawrence, Bernetti & Baumeister, 2007) and engaged students set their personal standards and goals higher (Zhang, Gan & Cham, 2007). Moreover, study engagement is closely linked to optimal study experience and study success (Bilge et al., 2014; Salanova, Schaufeli, Martinez & Breso, 2010). Research has also found that engaged students use effective coping strategies and thereby experience lower levels of stress compared to unengaged students (Gan, Yang, Zhou & Zhang, 2007). Research indicates that an optimistic attitude, enthusiasm, and commitment to studies promote the possibility of experiencing study engagement (Salmela-Aro & Kunttu, 2010). Determining and setting learning objectives increases the possibility of being motivated and even experiencing study engagement (Bilge et al., 2014). Bilge et al. (2014) also suggest that having positive feelings and high self-efficacy promotes the experience of study engagement. Pedagogic practices and teaching should therefore be built in a way that helps students set learning goals, receive positive feedback, and promote feelings that contribute to study engagement (e.g., Pietarinen, Soini & Pyhältö, 2014).

1.5 Physiological aspect of emotions in occupational well-being

The relationship between occupational well-being and cardiac autonomic activity has already been widely researched, but this research has mainly focused on the negative aspects, such as burnout and stress (Melamed, Shirom, Toker, Berliner & Shapiro, 2006; Zhang, Loerbroks & Li, 2018) and HRV has hardly been utilized in counseling interaction situations. HRV is an effective tool for measuring affective states and emotions, and it is an adequate signal of autonomic nervous system (ANS) regulation (Appelhans & Luecken, 2006). HRV is a great apparatus for indicating physiological health; for example, low HRV is a signal of increased risk of cardiovascular diseases (Lennartsson, Jonsdottir & Sjörs, 2016; Lewis, 2005). HRV is only one of several indicators that can provide information about autonomic nervous functioning. These include electroencephalography (EEG) (Niedermeyer & Silva, 2004), electrooculography (EOG), pupil size changes, and galvanic skin response (GSR; Montagy & Coles, 1966). We used HRV in this study because it is
both noninvasive (Szatjel, 2004) and the most promising tool for observing emotional responses (Appelhans & Luecken, 2006).

Emotion regulation reflects changes in HRV; effective emotion regulation increases HRV, and poor emotion regulation decreases HRV (Appelhans & Luecken, 2006). Reduced HRV, for instance, is common in individuals suffering from burnout or stress (Montano et al., 2009; Task Force of The European Society of Cardiology and The North American Society of Pacing and Electrophysiology, 1996) and increased HRV is typical in individuals experiencing emotional and psychological well-being (Thayer, Åhs, Fredrikson, Sollers III & Wager, 2012) and even work engagement (Seppälä et al., 2011).

Effective emotional regulation helps to modify emotional reactions and to attain goals, while poor emotional regulation increases the risk of using substances for emotion regulation (Suri & Gross, 2016). Psychophysiology of emotions and heart rate variability are described in the following paragraphs.

One of the most consistent theories of emotions is the circumplex model (Posner, Russel & Peterson, 2005; Russel, 2003), wherein emotional reactions can be reflected as responses in the central and autonomic nervous system (Appelhans & Luecken 2006; Cacacioppo, Larsen, Poehlmann & Ito, 2004). The model combines discrete emotions (Ekman, 1992) and a dimensional approach to emotions (Posner et al., 2005) and thus provides a great theoretical background for emotion research. The circumplex model of emotion identifies emotions by the valence (approach–withdrawal) and arousal (excited–calm), which indicates the function and condition of emotion (Lazarus, 1991). Emotional responses can be seen as changes in cognitive processes, facial expressions, brain, and subjective emotional experiences, and emotions have a significant role in cognitive activity, social interaction, and even the biological units of a human being (Keltner & Gross, 1999). Emotions can be referred to as hormonal and neural responses, and psychophysiological measures utilize somatovisceral afferents of emotional experiences (Applehans & Luecken, 2006; Cacacioppo, Brenston, Larsen, Poehlmann & Ito, 2004), which provides a considerable insight into interactional processes. Emotion theorists, such as Ekman (1992), Izard (1991), and Lazarus (1991), argue that emotions play a central role in goal pursuit, personal needs, and aims that are essential for subjective well-being.

HRV refers to beat-to-beat (R-R interval) temporal variation. HRV indicates changes in the autonomic nervous system (ANS) by both components of ANS: parasympathetic and sympathetic arms (Brentson et al., 1997). Emotional reactions can be seen as changes in ANS activity, especially by the dominance of
parasympathetic and sympathetic activity where parasympathetic activity refers to recovering and maintaining vital functions and sympathetic activity increases arousal and, for instance, elevates the heart rate (Berntson et al., 2007). Sympathetic activity is dominant in stress situations, whereas parasympathetic activity produces relaxation (Berntson et al., 2007). HRV presents a promising tool for measuring these changes in the autonomic nervous system as emotional changes; positive emotions indicate parasympathetic activity and negative emotions sympathetic activity (Appelhans & Luecken, 2006; Cerutti, Bianci & Mainardi, 1995; Valenza, Lanata & Scilingo, 2012). Appelans and Luecken (2006) proposed two major theoretical frameworks that indicate the relationship between HRV and emotional responding. Emotion regulation is one vital factor in social competence and psychological health, and HRV offers a great possibility for indicating emotional regulation physiologically (Appelhans & Luecken, 2006).

HRV reflects the psychophysiology of emotions, as sympathetic activity relates to depression and stress and parasympathetic activity indicates enhanced attention and effective emotional regulation (Cacioppo, Brentson, Larsen, Poehlmann & Ito, 2004; Cacacioppo & Tassinary, 1990; Friedman & Thayer, 1998). Prior researchers agree that HRV indicates emotional changes, but that the linkage is not straightforward; negative emotions are linked to stronger autonomic responses than positive emotions are. Scientific consensus is still lacking about the relationship between emotions and autonomic responses, although researchers acknowledge that discrete emotions have different autonomic patterns (Kreibig, 2010). Furthermore, changes in the autonomic nervous system reflect the emotional state’s arousal level than its discrete basis (Mauss & Robinson, 2009).

Respiratory sinus arrhythmia (variation in heart rate caused by HRV and respiration), which is reflected in the rhythm of breathing, modifies the association between HRV and emotional responses—breathing in shortens HRV frequency and increases sympathetic stimulus; breathing out lengthens HRV frequency and increases parasympathetic stimulus (Grossman & Taylor, 2007). Respiratory sinus arrhythmia increases high HRV frequency in accordance with the cardiac vagal tone of heart rate (Grossman & Taylor, 2007) and in that way modifies the direct association between HRV and emotions. Regardless, measuring autonomic nervous system activity offers non-invasive, temporally accurate data of sympathetic and parasympathetic activity that are linked to the emotional reactions and state of an individual (Hainsworth, 1995).

Previous studies have proposed that emotion regulation mediates the connection between HRV and subjective well-being (Appelhans & Luecken, 2006;
However, it is worth acknowledging that, in healthy individuals, high HRV does not automatically reflect emotional regulation; part of the variability is caused by heart responses to physiological oscillatory signals, such as breathing and blood pressure changes (Mather & Thayer, 2018). The association between HRV and subjective well-being is supported by studies reporting the relationship between HRV and perceived emotional stress (Dishman et al., 2000). Beyond emotion regulation, HRV is also associated with coping style and setting goals (Geisler & Kubiak, 2009). HRV has also been previously linked to self-control; high self-control provides higher heart rate variability and lower resting heart rate (Daly, Baumeister, Delaney & MacLachan, 2014). Collins and Karasek (2010) found an association between lower variance of cardiac vagal activity and high job strain and even exhaustion. Overall, the psychophysiology of emotions and psychophysiological measurements provide valuable background and method to investigate psychological well-being. So far, research about the association between HRV or other psychophysiological indicators and counseling interaction is lacking. In this study, we want to examine the association between the counseling skills of the counselors and the HRV of clients in order to provide objective information about emotional changes during counseling sessions.

1.6 Social interaction

In this sub-chapter, social interaction is described by the concepts of counseling skills (see Sub-chapter 1.2.1), social skills (see Sub-chapter 1.2.2), and social support (see Sub-chapter 1.2.3). Social interaction refers to people’s interpersonal activity that takes place in different circumstances. Social interaction consists of social skills and social relationships. The concept of communication is closely related to social interaction and can be referred to as nonverbal and verbal communication (Greene & Burleson, 2003). These communication skills are the specific factors that make social interaction situations influential, and in this study, those communication skills are examined and identified as counseling skills and social skills. These skills help to maintain social, psychological, and occupational well-being (Segrin & Givertz, 2003). Furthermore, social skills are closely connected to social support, which explains more specifically the association between the quality of social interaction and well-being this study is about. In this study, we focus on counseling skills, social skills and social support. We use the term counseling skills to describe interpersonal or communication skills related to
counseling interaction, as presented in the literature. The concepts related to quality of social interaction are presented also in Figure 1.

![Quality of Social Interaction Diagram]

**Fig. 1. Concepts related to the quality of social interaction.**

### 1.6.1 Counseling skills

Counseling refers to the interactional learning process between a counselor and a client, assuming that the aim of the counseling is to respond to the needs of the client (Okun & Kantrowitz, 2007). Counseling can also be identified as helping people cope with challenges and opportunities—or, with what one might call “normal problems,” even though they might be quite complex (Ivey, Ivey & Zalaquett, 2010). In order to be effective in counseling, counselors must use interpersonal skills to understand both verbal and nonverbal messages from the client and to respond to those effectively (Okun & Kantrowitz, 2007).

The background in counseling skills in this study lies in the Human Relations Counseling Model (Okun, 2002), Micro Counseling skills (Ivey, 1971, 2007), and the Human Resource Development model (Truax & Clarhuff, 1976), all of which emphasize specific interpersonal skills that make counseling interactions effective. Specific interpersonal skills are usually divided into verbal and non-verbal communication (Okun & Kantrowitz, 2007). Verbal communication skills include the following: 1) making minimum verbal response, 2) paraphrasing, 3) reflecting,
4) using questions, 5) clarifying, 6) interpreting, 7) confronting, 8) informing, 9) summarizing, and 10) processing the relationship (Okun & Kantrowitz, 2007). Controversially, nonverbal skills reflect facial expressions and eye contact, body language or movement, tone of voice, and the use of interpersonal space (Okun & Kantrowitz, 2007). There are many theoretical models for counseling, and one of the most beneficial models is presented by McLeod (2011). The model conceptualizes basic competencies in counseling as understanding, awareness, effective listening, an empathic approach, target determination, easing adaptation, and process monitoring (McLeod, 2011). These specific skills help the counselor to identify and clarify the client’s underlying concerns (Okun & Kantrowitz, 2007).

Research suggests that concentrating on these specific interpersonal skills in counseling and other interaction situations is effective for counseling (Baker & Daniels, 1989, 1990; Buser, 2008). Interpersonal skills can be improved by practicing specific techniques (Okun & Kantrowitz, 2007). These specific techniques include, for example, verbal responding, which can be exercised by reflecting the client’s feelings for the client in order to help the client differentiate between thought and feelings (Okun & Kantrowitz, 2007). Responsive listening and paraphrasing are techniques to help the counselor hear the client’s message (Okun & Kantrowitz, 2007).

Originally, the idea of client-centeredness is derived from Carl Roger’s (1961) work in humanistic counseling that underlines the role of facilitation of clients’ thoughts, feelings, and actions. Truax and Clarhuff (1967) continued the work with humanistic counseling and highlighted the importance of empathy in the counselor-client relationship. The human relations counseling model (HRCM) focuses also on warmth, personal involvement, and an empathic relationship in counseling (Okun & Kantrowitz, 2007). The counselor-client relationship is based on the process of verbal and non-verbal communication (Okun & Kantrowitz, 2007). The micro skills approach also concentrates on these specific interpersonal skills and the model includes five basic skills, such as attending and listening, and seven advanced skills, such as focusing skills and empathetic confrontation (Ivey et al., 2010). Micro counseling represents the first systematic video-based model that identifies specific observable skills (Okun & Kantrowitz, 2007) and has been widely tested and validated (Daniels & Ivey, 2007). Video-based analyses in laboratory settings are effective in analyzing counseling skills because observation provides important information about the specific features of counseling interaction that are difficult to self-rate. Video analysis offers a tool to make specific
observations and create a comprehensive view of social interaction (Barron, 2007) that would otherwise be difficult to observe.

Moreover, among different approaches to counseling skills, research suggests focusing on basic skills and defined communication, as they are beneficial to the client and counseling outcome (Odaci, Degerli & Bolat, 2017). Several studies have shown that these specific communication skills are related to the effectiveness of counseling and psychotherapy sessions (Baker & Daniels, 1989, 1990; Buser, 2008; Ivey, 1971; Ivey & Ivey, 2007; Okun, 2002; Truax & Carkhuff, 1967).

1.6.2 Social skills

From counseling interaction to social interaction in general, the concept of specific interpersonal skills refers to the concept of social skills. Social skills are defined in the literature by many terms, such as interpersonal skills, interpersonal competence, social competence, and communication competence (Segrin & Givertz, 2003). In this study, we refer to interpersonal skills in the context of counseling interaction as counseling skills and social interaction in general as social skills. In this sub-chapter, the concept of social skills is defined.

Social skills are conceptualized as the ability to integrate positive and negative feelings and thoughts and to behave appropriately and effectively according to personal goals and environmental requirements (Ford, 1982; Segrin, 1992). Social skills can also be identified through the skills and abilities that enable people to interact effectively and appropriately with others (Segrin, 1998, 2000). Appropriateness refers to obeying social norms, values and expectations, and effectiveness is related to the achievements and accomplishments of one’s own goals (Segrin & Givertz, 2003). Social skills are also presented in the literature as part of the concept of social competence, which refers to the ability to handle social interaction effectively and to integrate emotions, behavior, and cognitions successfully in interactions with others (Topping, Bremner & Holmes, 2000). Social competence helps people to integrate feeling and behave according to environmental factors and obtain successful outcomes from interactions with others (Bierman & Welsh, 2000). Social interaction includes several verbal and nonverbal social and cultural codes, and to communicate effectively requires handling both nonverbal and verbal aspects of social interaction well (Burgoon & Baceue, 2003). Social skills training focuses mainly on components of effective communication, such as appropriate use of eye contact, facial expressiveness, and verbally expressing interest and listening to a conversational partner (Segrin & Givertz,
Good social skills are associated with many psychological and social consequences, such as psychological well-being and interacting with other people effectively (Segrin, Hanzal, Donnerstein, Taylor & Domschke, 2007). Social skills increase social competence and emotional and behavioral adjustment (Spence, 2003). Social skills are associated with perceived social support (Siedlicki, Salthouse, Oishi & Jeswani, 2014) and satisfying relationships (Del Prette & Del Prette, 2013), which increases psychological well-being (Xanthopoulou, Bakker, Demerouti & Schaufeli, 2009). Social skills are shown to decrease negative emotions such as anxiety, loneliness, and depression (Riggio et al., 1990), which is partly explained by satisfying relationships (Del Prette & Del Prette, 2013) and perceived social support (Siedlicki et al., 2014).

1.6.3 Social support

The concept of social support refers to one’s perception of how one is loved, valued, and respected by others and how easily one can access social support if needed (Lee & Hong, 2005; Sarason, Levine, Basham & Sarason, 1983). Social support is divided into emotional support and instrumental support (Sarason et al., 1983), where emotional support refers to the listening and empathizing that enhances emotional well-being, and instrumental support is constituted of concrete resources provided by other people (House, 1981; Karasek & Theorell, 1990). According to House and Kahn (1985) social support can be characterized as emotional, instrumental and informational assistance. Emotional support is related to love and caring, encouragement and sympathy when instrumental assistance refers to behavioral or material help (Thoits, 2011). Informational assistance reflects on help and advice received by others to help solve a problem (Thoits, 2011). Social support is received from significant others (persons to whom the individual is emotionally tied) and from the members of the secondary group (a larger group of people whose members’ knowledge about one another is less personal) (Thoits, 2011). The existence of social support can be illustrated by the effectiveness of the stress-buffering effect. Significant others provide love, caring and sympathy as emotional support, while similar others offer more empathetic understanding and acceptance of ventilation (Thoits, 2011).

Social support has various positive outcomes in one’s life. Social support enhances positive adjustment and personal development and buffers the effects of
stress in general (Lakey & Orehek, 2011; Sarason et al., 1983). Perceived social support is also related to better psychological and physiological health (Taylor, 2011; Thoits, 2011). At work, social support can be identified by job resources that enhance job performance (Bakker & Demerouti, 2007), buffer the stressors at work (Karasek, Triantis & Caudry, 1982) and increase employee satisfaction (Erdogan & Enders, 2007) and work ability (Peters, Spanier, Radoschewski & Bethge, 2018). In one’s life generally it is characterized by effective stress coping and increasing well-being (Liu, Li, Ling & Cai, 2016; Sarason, Pierce & Sarason, 1990). Social support is one essential source of satisfying the basic psychological need of human relatedness (Deci & Ryan, 2000, 2014).

Social support is derived from different sources, such as private life (e.g., spouse, family, friends) and work life (e.g., colleagues and supervisors). In private life, social support is provided by family members, friends, neighbors, and others (Barrera, Sandler & Ramsay, 1981) and at work by supervisors and co-workers (Dawley, Andrews & Bucklew, 2008; Karasek & Theorell, 1990). Social support at work is divided into socioemotional and instrumental support, where socioemotional support is constituted of social and emotional integration and trust between colleagues and supervisors (Karasek & Theorell, 1990). The assistance of supervisors or colleagues with work tasks forms the instrumental dimension of social support at work (Karasek & Theorell, 1990).

Supervisory social support is also conceptualized in research by dialogic leadership theory that emphasizes the interactional process of supervisor and subordinate (Isaacs, 1999; Yukl, 2002). Supervisory support can be either emotional (i.e., showing empathy), informative (i.e., giving feedback or guidance), or material (i.e., promoting employees’ resources) (Bhanthumnavian, 2003). Social support from spouse and colleagues is helpful in reducing family-to-work conflict, whereas social support from supervisors and colleagues helps an individual to cope with time-based work-to-family conflict and strain-based family-to-work conflict (van Daalen, Willemsen & Sanders, 2006). It seems that sources of social support have a particular influence on work and family balance. Significant others (such as a spouse) provide caring and companionable support, while similar others (such as colleagues or a supervisor) offer advice, appraisal, and encouragement support; both sources are needed, and the sources of social support (significant others, similar others) respond to different needs, such as self-esteem, belonging, and stress-buffering (Thoits, 2011). The effectiveness of social support for mental health culminates in the matching hypothesis that refers to the match between job demands and resources (de Jonge et al., 2014). Job resources, such as social support
and the source of social support, do not automatically provide a stress-buffering effect if the source of social support does not respond to one’s needs (de Jonge et al., 2014). For example, when one is extremely strained by work, empathy and love from significant others is needed; when one is handling a difficult work task, a colleague to help solve the problem releases stress more than sympathy from home does.

Along with the several positive outcomes of social support, the role of social support, especially in one’s private life, has hardly been examined in terms of work engagement. This study aims to examine the role of the various dimensions (work, private life) of social support for work engagement. The study also aims to investigate whether work stress modifies the association between social support and work engagement.

1.6.4 Social interaction and occupational well-being and ill-being

Social interaction and social relationships support basic psychological needs, such as relatedness and attachment (Deci & Ryan, 2000), which promote psychological well-being. Positive relationships are associated with psychological well-being (Segrin & Taylor, 2007). Positive relationships are identified as satisfying and trusting relationships with other people, and these relationships are characterized by empathy and intimacy (Ryff & Singer, 2000). Research indicates that positive and satisfying relationships are one essential factor of making people happy (Diener & Seligman, 2002). People who have satisfying relationships can turn to people when needed and receive support, which could be one explanation for the role of social relationships in happiness and health.

Social skills are associated with many positive aspects of psychological well-being. Research indicates that higher social skills promote self-esteem (Riggio, Throckmorton & Depaola, 1990) and higher life satisfaction (Malinauskas, Dumciene & Lapeniene, 2014). Students in academic life are shown to perform better when they have higher social skills (Demaray & Elliot, 2001). Previous studies propose that social relationships and social skills are related to the experience of both engagement and burnout among university students (Halbesleben & Buckley, 2006; Wang & Eccles, 2012) and employees (Bakker & Demerouti, 2007). Social skills emphasize perceived social support (Riggio, Watring & Throckmorton, 1993), which is linked to the enhancement of engagement (Wang & Eccles, 2012) and buffering burnout risk (Jacobs & Doff, 2003; Kutsal & Bilge, 2012). As previously described, positive relationships are
associated with well-being, and they are also linked to engagement in higher education (Bilge, Dost & Cetin, 2014). Positive relationships impact students’ decisions to stay at a university as they enable the development of a sense of belonging (Deci & Ryan, 2000), which is referred to in academic contexts as the feeling of being connected to the institution, other students, the university community, and academic ability (Morrow & Ackermann, 2012).

Prior research proposes that social skills are also related to perceived social support (Riggio, Watring & Throckmorton, 1993). A review study (Taylor, 2011) shows how greater perceived social support is strongly connected to psychological well-being. The experience of how one is cared for in supportive social relationships enhances mental and physical health (Taylor, 2011). A sense of belonging to work or study groups and positive relationships between colleagues and other students are related to psychological well-being and the experience of engagement (Bilge et al., 2014). Life satisfaction may be one explaining factor in the association between social support and subjective well-being (Siedlicki et al., 2014). Social support, and especially an expectation of being able to rely on someone when needed, is essential for life satisfaction (Siedlicki et al., 2014).

Previous studies reveal that social support in private life buffers job strain (Madsen, 2014). Especially social support received by family members is shown to be linked to better well-being (Diener & Seligman 2002; Gülälti, 2010). Several studies show that social support at work is positively connected to the experience of work engagement (Nasurdaín, Ling & Khan, 2018; Othman & Nasurdaín, 2013; Taipale, Selander, Anttila & Nätti, 2011). Overall, a growing body of research indicates that good social skills are important in maintaining social, psychological, and occupational well-being, and the lack of such skills is linked to risks for a range of problems (Segrin & Giverz, 2003).

1.7 Need for further studies

Prior studies have examined the association between HRV and psychological outcomes such as subjective well-being (Appelhans & Luecken, 2006; Geisler et al., 2010) and stress (Melamed et al., 2006; Zhang et al., 2018) but so far, the relationship between HRV or other psychophysiological indicators and counseling interaction is lacking. This study aims to investigate the association between counselors’ counseling skills and clients’ HRV to gather information about emotional changes during counseling.
The role of social skills in contemporary working life and in higher education has been widely emphasized. Prior research has focused on the link between social skills and psychological well-being (e.g., Segrin & Taylor, 2007), but the specific role of social skills for burnout and engagement has hardly been examined to date. A study among medical residents has provided preliminary results about the role of social skills in preventing burnout (Pereira-Lima & Loureiro, 2015), and further studies are needed to support them.

Social support has been proposed to act as a potential resource for work engagement in JD-R theory (Bakker & Demerouti, 2007), and we want to examine that association of social support and work engagement. Moreover, we examined the role of social support in different dimensions; as supervisory and collegial support at work and as support from a spouse, friends and neighbors in private life. We also examined whether different dimensions (social support at work and in private life) are differently linked to the dimensions of work engagement (vigor, dedication, absorption). Research is still lacking about the link between social support and work engagement, especially in private life, and this study aims to respond to the need for examine different dimensions of social support, including that in private life, for work engagement. A review study indicates that social support plays a role in decreasing the level of work stress and promoting job performance (AbuAlRub, 2004) and another study shows that organizational support plays a moderating role in the association between strain and work engagement (Zacher & Winter, 2011); however, research into the modifying role of work stress for the linkage between different dimensions of social support and work engagement is still scarce. We examined the effect of an increase in work stress on the strength of modification of the association between social support and work engagement.
2 Aims of the study

The general purpose of this study is to examine the relationship between the quality of social interaction and psychological well-being in terms of engagement and burnout in higher education and at work. The first aim is to examine the association between counseling skills and clients’ heart rate variability as an indicator of emotional well-being. This might provide new possibilities for developing counseling interaction and increasing clients’ well-being and benefits from the counseling sessions. The second aim is to investigate the role of social skills in the experience of engagement and burnout among university students. These results can afford a way to develop teaching methods and teaching environments in order to promote students’ engagement and buffer the risk of experiencing burnout. The third aim of the dissertation is to examine the association between various dimensions of social support and work engagement. This might provide possibilities for developing work societies and environments that support social relationships.

Study I. This study’s aim was to examine the association between counselors’ counseling skills and clients’ HRV. We hypothesized that higher scores in counseling skills are associated with an increase in high frequency and a decrease in low frequency HRV.

Study II. The aim of Study II was to investigate whether social skills are associated with (i) engagement and (ii) burnout among university students. We hypothesized that higher social skills are associated with lower burnout and higher engagement among students. We also report our findings about the association between study-related burnout and engagement.

Study III. The aim of Study III was to examine (i) whether social support at work is associated with work engagement and (ii) whether social support in private life is associated with work engagement. Study III also researched whether work stress modifies the association between social support and work engagement. We hypothesized that high social support at work and in one’s private life is associated with higher work engagement. We also hypothesized that work stress modifies the relationship between social support and work engagement because somebody experiencing a higher work stress level would benefit more from social support than somebody experiencing lower levels.

The core concepts related to sub-studies are presented in Figure 2.
Fig. 2. The core concepts related to sub-studies I–III.
3 Methods

In this chapter, the methodology of the study is described. Firstly, the participants of sub-studies are presented, secondly, the measures used in sub-studies are described. The statistical analysis of sub-studies is presented in the last sub-chapter.

3.1 Participants

Participants in Study I of this dissertation were students enrolled in a counseling psychology course in advanced studies of educational psychology. Master’s students in educational psychology formed ten pairs of one counselor and one client. Participants acted in a triad setting in counseling sessions that consisted of a counselor, a client, and an observer. Participants worked in an authentic counseling session where the clients addressed real issues. The data was collected in 2010 and the data collection was executed in a laboratory setting using psychophysiological measurement (HRV) and video-based analysis.

Study II data collection was executed in 2013–2016 during educational psychology courses in basic studies and organizational psychology courses in advanced studies as part of the program in educational psychology at the University of Oulu. The courses were selected because of the heterogeneity of the course attendants from different faculties. The students filled out the questionnaire in the lectures on paper or online (approximately 75% of the questionnaires were filled on paper). The data included 351 students (approximately 70% of course attendants). Participants represented all seven faculties at the University of Oulu (46.3% education, 20.8% humanities, 17.4% science, 3.9% medicine, 6.6% economics, 2.4% technology, and 1.2% information technology).

The study sample in Study III consisted of participants in the Northern Finland birth cohort 1966 study (NFBC; University of Oulu, 2020). NFBC is a longitudinal research program that aims to develop population-level health and well-being. The cohort study data collection started with 12,058 live-born children (with due dates in 1966, representing 96 % of all births in the region in 1966) who have been followed on a regular basis since the antenatal period by health care records, questionnaires, and clinical examination. This dissertation utilizes the data from a 46-year follow-up study. The participants were able to fill out the questionnaire either by internet or on paper in 2012. The 6,868 participants represented 66.5% of the target population of 10,321 cohort members who were alive and residing in
Finland. The sample size for the final analysis was 5,259–5,376. Research design, study variables and main statistical methods of all sub-studies are presented in Table 1 and descriptive statistics of study variables in Table 2.

### Table 1. Research design, study variables, and main statistical method used in Studies I–III.

<table>
<thead>
<tr>
<th>Research design</th>
<th>Main statistical method</th>
<th>Study I</th>
<th>Study II</th>
<th>Study III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants</td>
<td>Students in counseling psychology (n = 20)</td>
<td>University students (n = 351)</td>
<td>Northern Finland birth cohort 1966 study (n = 5,259–5,376)</td>
<td></td>
</tr>
<tr>
<td>Research design</td>
<td>Laboratory setting</td>
<td>Correlational</td>
<td>Correlational</td>
<td></td>
</tr>
<tr>
<td>Research method</td>
<td>Correlation, Grounded theory</td>
<td>Regression analysis (linear)</td>
<td>Regression analysis (linear)</td>
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</tr>
<tr>
<td>Years of data collection</td>
<td>2010</td>
<td>2013–2016</td>
<td>2012</td>
<td></td>
</tr>
<tr>
<td>Independent variables</td>
<td>Counseling skills</td>
<td>Social skills (self-report)</td>
<td>Social support in private life (self-report)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Social support at work (self-report)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Collegial support (self-report)</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Supervisory support (self-report)</td>
<td></td>
</tr>
<tr>
<td>Dependent variables</td>
<td>Heart rate variability</td>
<td>Study burnout (self-report)</td>
<td>Work engagement (self-report)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Study engagement (self-report)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control variables</td>
<td>Age, gender, field of study</td>
<td>Gender, marital status, education, occupational status, job strain, effort–reward imbalance</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 2. Descriptive statistics of study variables.

<table>
<thead>
<tr>
<th>Variable (range)</th>
<th>Study I</th>
<th></th>
<th>Study II</th>
<th></th>
<th>Study III</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq. (%)</td>
<td>Mean</td>
<td>SD</td>
<td>Freq. (%)</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Age</td>
<td>29.5</td>
<td>24.26</td>
<td>5.9</td>
<td>46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>19 (99.5%)</td>
<td>251 (70.5%)</td>
<td>2833 (52.7%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1 (0.5%)</td>
<td>74 (29.5%)</td>
<td>2542 (47.3%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marital status</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>In a relationship</td>
<td>(52.5%)</td>
<td></td>
<td></td>
<td>(78.9%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education (1–3)</td>
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<td></td>
<td></td>
<td>2.25</td>
<td>0.51</td>
<td></td>
</tr>
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<td>Study field (1–7)</td>
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<td>1.85</td>
<td>1.34</td>
<td></td>
<td></td>
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<tr>
<td>Occupational status (1–3)</td>
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<td></td>
<td></td>
<td>1.79</td>
<td>0.81</td>
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<tr>
<td>Counseling skills (SVRS)</td>
<td>10</td>
<td>3.62</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LF/HF1</td>
<td>5.00</td>
<td>4.56</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>LF/HF2</td>
<td>3.58</td>
<td>4.73</td>
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<tr>
<td>Study engagement</td>
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<td>0.77</td>
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<tr>
<td>Study burnout</td>
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<td>0.82</td>
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<tr>
<td>Social skills</td>
<td>4.56</td>
<td>0.60</td>
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<td></td>
<td></td>
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<tr>
<td>Work engagement</td>
<td></td>
<td></td>
<td></td>
<td>4.67</td>
<td>1.19</td>
<td></td>
</tr>
<tr>
<td>(0–6)</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Social support (1–5)</td>
<td></td>
<td></td>
<td></td>
<td>3.11</td>
<td>0.68</td>
<td></td>
</tr>
<tr>
<td>Job strain (1–5)</td>
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<td></td>
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<td></td>
<td></td>
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<tr>
<td>Effort-reward</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>imbalance (1–4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 Skilled verbal response scale, 2 Low frequency High frequency ratio before counseling session, 3 Low frequency High frequency ratio after counseling session, 4 Standard deviation

3.2 Measures

The measures used in sub-studies I–III are presented in the following sub-chapters. Firstly, psychological measurement as heart rate variability is presented. Secondly, well-being indicators as burnout and engagement are discussed. Thirdly, measures related to social interaction, such as counseling skills, social skills, and social support, are presented.
3.2.1 Heart rate variability (Study I)

Heart rate variability was assessed by participants acting as clients by the Polar S810i heart rate variability measurement. Participants wore breast belt measuring devices during the counseling session. We measured R-R intervals of abnormal beats, and the R-R data were obtained by the Kubios HRV analysis method (Tarvainen, Niskanen, Lipponen, Ranta-Aho & Karjalainen, 2014). Artifacts of the data were removed by Kubios analysis (Tarvainen et al., 2014). Spectral analysis was executed for the data with the Fast Fourier Transform (FFT) to extract powers from the spectral components that reflect both sympathetic and parasympathetic activity of the participants’ ANS activity (Li, Rüdiger & Ziemssen, 2019). We examined the R-R intervals in two-minute periods for each participant before and after the counseling session. Two-minute periods for R-R intervals have been also been used in prior studies (Dekker et al., 2000; Maheswhari et al., 2016). Frequency domain was used in this study for indicating HRV. High frequency and low frequency were computed for the final analyses.

3.2.2 Burnout (Study II)

The Finnish version of the Study Burnout Inventory (SBI-9; see Salmela-Aro, 2009) was used to measure the risk level of study-related burnout. Inventory is based on the original Maslach Burnout Inventory – Student Survey (MBI-SS; see Schaufeli et al., 2002a). The inventory consists of nine items ($\alpha = 0.84$) of three-factor structure based on the Maslach Burnout Inventory – General Survey (MBI-GS). Exhaustion includes four items such as “I feel emotionally drained by my studies” ($\alpha = 0.75$), cynicism consists of three items such as “I have become less enthusiastic about my studies” ($\alpha = 0.82$), and thirdly, inefficacy comprises two items such as “I often have feelings of inadequacy in my studies” ($\alpha = 0.60$) (Salmela-Aro et al., 2009; Schaufeli et al., 2002a). Burnout can be studied with one- or two-factor models, but prior literature shows that the three-factor model is more reliable than those models and has shown the best data fit (Schutte, Toppinen, Kalimo & Schaufeli, 2000). Inefficacy showed lower reliability than exhaustion and cynicism, the three factor-model is aligned with the demands and resources theory and provides more detailed information about students’ burnout symptoms (Schaufeli et al., 2002a) than the one- or two-factor models. Students were asked to respond to the questionnaire on a six-point Likert scale (from 1 = strongly disagree to 6 = strongly agree). The reliability and validity of the scale have been verified in several
studies (Breso, Schaufeli & Salanova, 2011; Mostert, Pienaar, Gauche & Jackson, 2007; Schaufeli et al., 2002a; Uludag & Yaratan, 2010). The structural equation model showed strong inner compatibility and reliability for all the dimensions of burnout (Salmela-Aro et al., 2009). We used the mean score of burnout scale in our analyses.

### 3.2.3 Engagement (Studies II–III)

The Finnish version of the Utrecht Work Engagement Scale for Students (UWES-S; see Schaufeli et al., 2002b) was used to measure the level of engagement among university students. The scale includes nine items ($\alpha = 0.91$) and is divided into three dimensions: vigor ($\alpha = 0.79$, three items such as “When I study, I feel like I am bursting with energy”), dedication ($\alpha = 0.85$, three items such as “I find my studies to be full of meaning and purpose”), and absorption ($\alpha = 0.76$, three items such as “Time flies when I’m studying”) (Schaufeli et al., 2002). Items are rated on a six-point Likert scale (from 1 = strongly disagree to 6 = strongly agree). Reliability and validity for the scale among university students have been verified (Breso, Schaufeli & Salanova, 2011; Mostert et al., 2007; Schaufeli et al., 2002; Uludag & Yaratan, 2010). The measurement has also been validated in Finland for higher education students (Salmela-Aro et al., 2009). Construct validity for the measurement was also validated by structural equation modelling, which revealed strong inner compatibility and the model fit well with the data (Schaufeli et al., 2002b).

**Work engagement** was assessed by a shortened version of the Utrecht Work Engagement Scale (UWES-9; see Schaufeli et al., 2002a). The scale is divided into three dimensions: vigor ($\alpha = 0.86$, “In my job, I feel strong and vigorous”), dedication ($\alpha = 0.89$, “I am enthusiastic about my job”) and absorption ($\alpha = 0.86$, “I feel happy when I am working intensely”), resulting in nine items (Cronbach’s $\alpha = 0.93$). The items are scaled in seven-point from 0 (never) to 6 (always). We used the mean score of work engagement in our analyses. Previous studies have confirmed the reliability of the scale (Schaufeli, Bakker & Salanova, 2006).

### 3.2.4 Social interaction factors (Studies I–III)

*Counseling skills* were estimated by the Counselor Response Observation System (CROS) measurement (Rantanen & Soini, 2013). CROS is based on a video analysis method in which the counselor’s responses are analyzed with two different
scales; the Skilled Verbal Response Scale (SVRS) and Counselor Response Coding System (CRCS; see Rantanen & Soini, 2013). According to Rantanen and Soini (2013), the CRCS is based on a systematic observation and coding method that allows specific quantification of counseling behavior and enables each counseling speech sequence to be coded relative to the message of the client. It comprises two categorial variables, counselor response and counselor response focus. Each consists of five categories; counselor response includes reflection, specifying question, conclusion, suggestion, and self-disclosure, while counselor response focus includes feelings, explanations, action, context, and strength. Correspondingly, SVRS analyzes the responses of the counselor (Rantanen & Soini, 2013). In the dissertation, SVRS was used to analyze the counseling skills of the counselors. SVRS measures two factors; client-centeredness and consistency in the counselor’s action (Rantanen, 2014). Client-centeredness and consistency refer to the main aim of counseling which refers to the aim of the counselor to help the client explore his or her issues (Okun & Kantrowitz, 2007; Rantanen & Soini, 2013). The two factors of SVRS include six observational items such as “the counselor speaks of things that the client has not mentioned,” “the counselor uses open questions,” or “the counselor focuses on exploring the client’s problems” rated on a 4-point Likert scale (0 = not at all, 1 = a little, 2 = somewhat, 3 = a lot) (Rantanen, 2014).

Grounded theory (Glaser & Strauss, 1967) was used to qualitatively analyze critical cases in counseling sessions. Grounded theory is based on coding, which refers to conceptualizing, operationalizing, and remodifying the data (Glaser & Strauss, 1967). The aim of grounded theory is to find relationships between the core concepts (Glaser & Strauss, 1967). Critical cases were identified as the counseling case with the highest SVRS scores and positive ANS change and the counseling case with the lowest SVRS scores and negative ANS change. We analyzed the transcripts of the counseling conversation of the critical cases and constructed themes by the phases of grounded theory from conceptualizing to remodifying. Our aim was to find the discriminative item to explain positive and negative outcomes of these critical cases.

Self-rated social skills were measured by asking students to self-rate their social skills by filling out a questionnaire that included six items (α = 0.76, e.g., “I find it difficult to argue my opinions in a group situation,” “I am able to argue my opinions rationally in group situations”) of self-evaluated perceptions about the level of their social skills. The theoretical background of the questionnaire is based on the theoretical frame of specific communication skills research and theory,
namely those highlighted in the Human Resource Counseling Model (HRCM; see Okun, 2002), micro-counseling (Ivey, 1971; Ivey & Ivey, 2007) and Human Resource Development (HRD; see Truax & Clarhuff, 1967). These theoretical models emphasize the client-centeredness and facilitation of thoughts, feelings, and actions of the clients; they are based on humanistic psychology (Rogers, 1961). For example, HRCM underlines the importance of empathy and personal involvement in counseling conversation that is based on both verbal and nonverbal communication skills (Okun & Kantrowitz, 2007). Specific interpersonal skills (e.g., attending, listening, focusing, and empathetic confrontation) are presented in the micro skills approach (Ivey et al., 2010) that are applicable in counseling as well as in other kinds of social interaction situations.

Several studies suggest that focusing on these specific skills offers a chance to develop social skills in counseling interaction (Baker & Daniels, 1989, 1990; Buser, 2008). The questionnaire also focuses on themes such as communication, assertiveness, empathy, work (coordination interaction situations), and expressing positive feelings as in the Social Skills Inventory (SSI-Del-Prette; see Del Prette & Del Prette, 2013). Mean score was used in our analyses.

Social support was measured by utilizing a modified version of the Social Support Questionnaire (SSQ; see Sarason, Levin, Basham & Sarason, 1983). Various dimensions of social support were measured, such as social support in private life ($\alpha = 0.79$) (constituting social support from a spouse, friend, or relative) and social support at work ($\alpha = 0.85$) (constituting social support from a colleague or supervisor). The modified version of Sarason et al.’s (1983) questionnaire in this dissertation consisted of two questions in relation to seven distinct sources of social support (Cronbach’s $\alpha = 0.9$), as follows: “If you faced problems, how much would your mental well-being be supported by advice from 1) a spouse, 2) a close relative, 3) a close friend, 4) a colleague, 5) a supervisor, 6) occupational health care, and 7) an employment office.” Questionnaire items were scaled in five-point Likert from 1 (much) to 5 (not at all). Reliability of the Sarason et al.’s (1983) questionnaire has been validated (Sarason, Sarason, Shearin & Pierce, 1987). We used the total score of social support (the mean score of total social support), the score of social support in private life (the mean score of social support from spouse, friends, and relatives), and the score of social support at work (the mean score of social support from colleagues and supervisors).
3.2.5 Job stress variables

Job strain was assessed using the Job Content Questionnaire (JCQ; see Karasek, 1985). Job strain was measured by dividing job demand items (“Your job requires the ability to get along with others”) from job control items (“How much influence do you have on the tasks that constitute your job?”). Items were rated on a 5-point Likert scale (strongly disagree – strongly agree). The questionnaire included nine items of demands ($\alpha = 0.89$) and fifteen items on job control ($\alpha = 0.87$). High values of the ratio (job demand/job control) indicate higher job strain. Many studies have confirmed the validity and reliability of the questionnaire to be an adequate indicator of occupational stress covering different kinds of occupations and nationalities (Karasek et al., 1998; Niedhammer, 2002; Ostry et al., 2001). We used the sum variable of job strain in our analyses as the control variable. Effort-reward imbalance (ERI) was assessed using the Occupational Stress Questionnaire (Siegrist et al., 2004). Items were comprised of effort (three items, $\alpha = 0.69$) and rewards (four items, $\alpha = 0.73$). Effort items of the scale assess the level of time and energy employees are investing in their jobs and, correspondingly, reward items measure the level of job security, amount of salary, and self-acceptance at work (Siegrist, 1996). ERI was measured by dividing mean scores of effort items by reward items (Siegrist et al., 2004). Items were scaled on a 4-point Likert scale from strongly agree to strongly disagree. The measurement scale is well-validated (Siegrist et al., 2004).

3.2.6 Control variables (Studies I–III)

Gender was classified as 1) male and 2) female in sub-study 2 and in sub-study 3 0= boy and 1= girl. Age was assessed using the following classification: 1 = 19–24 years, 2 = 20–24 years, 3 = 25–29 years, 4 = 30–34 years, 5 = 35–39 years, and 6 = 40–44 years.

Education was assessed as the field of study and in sub-study 3 as education level. Field of study was classified as 1) education, 2) humanities, 3) science, 4) medicine, 5) economics, 6) technology, and 7) information technology. In Study III, we used education level that was classified as 1) comprehensive school, 2) intermediate, and 3) academic degree.

Occupational status was assessed using classification based on the Central Statistical Office of Finland: 1) manual, 2) lower non-manual, and 3) upper non-
manual. Marital status was classified as 0) not in a relationship and 1) in a relationship.

We also used work stress models such as effort-reward imbalance (Siegrist 2004) and job strain (Karasek 1985) as control variables when examining the association between social support and work engagement.

3.3 Statistical analysis

In Study I, our examination of the association between counselors’ counseling skills and clients’ HRVs, we investigated the obtained R-R data of the clients for abnormal beats and the skill level of the counselors.

HRV analysis was run with HRV Analysis software (University of Kuopio, Finland). Data were analyzed with spectral analysis. Fast Fourier Transform was performed on the data using Welch’s period gram (window size 256, overlap 50%) to examine the spectral components related to sympathetic and parasympathetic activity of the client before and after the counseling session. The total scores of the SVRS of counselors were computed. We analyzed the data using Spearman’s nonparametric correlation between spectral components and SVRS scores. We analyzed all the participants with the HRV analysis.

We used linear regression in Study II to examine the association of social skills with engagement and burnout. Assumptions for conducting regression analysis were checked graphically. With study burnout as the dependent variable, all the interactions except the one between gender and social skills were significant (p = 0.05), so the analyses were run for both men and women together.

Then we analyzed the interaction between gender and engagement with burnout as the dependent variable. All the interactions except interaction between gender and social skills with study burnout as dependent variable was significant (p = 0.05) so the analyses were run for both men and women together. Factor analysis was run for the social skills questionnaire. Social skills items loaded on two factors, of which six loaded on the first factor and only two items on the other factor. Item (“I give advice as often as it is possible”) loaded low on both factors 1 and 2 (0.16 and 0.17). The other remaining item (“I consider myself a good listener”) was loaded on the second factor and received low loading on the first factor (0.12) and it differed by theme from other items and was thus removed. The remaining six items (α = 0.76) loaded on factor 1 were used in the analyses.

The final analyses were run for age and gender-adjusted linear regression analyses to investigate the association between social skills and engagement. Age
and gender-adjusted linear regression analysis was also run to examine the association between social skills and burnout.

Engagement was set as the predictor in analyses for the associations between engagement and burnout. Social skills were adjusted to analyze whether social skills explain the association between engagement and burnout. We ran linear regression analyses for burnout and engagement with gender and age as control variables. Engagement was set as a predictor in the analyses of the association between engagement and burnout.

In Study III, we ran linear regression analyses to examine the association between social support and work engagement. Assumptions for conducting regression analysis were checked graphically, and the data was approximately normally distributed. Work engagement was set as a dependent variable. We conducted separate analyses for total work engagement and for the subscales of work engagement (vigor, dedication, and absorption). Two models were conducted. Model 1 was adjusted for gender and Model 2 was adjusted for gender, marital status, education, occupational status, job strain, and effort-reward imbalance.

We also examined separately whether social support at work and social support in private life are associated with the work engagement of each other. Social support in private life was adjusted in analysis predicting work engagement by social support at work. Social support at work was adjusted for the analysis that examined whether social support in private life is associated with work engagement.

We also ran additional interaction analyses to examine whether job strain and effort-reward imbalance moderates the relationship between social support and work engagement. Analyses were conducted as follows: a) the interaction between job strain and social support, and b) the interaction between effort-reward imbalance and social support when predicting work engagement. The main effects included in the additional analyses were job strain, effort-reward imbalance, and social support. The two models conducted were gender-adjusted and fully adjusted (gender, marital status, education, socioeconomic status, and main effects of job strain, effort-reward imbalance, and social support).
4 Results

The results of sub-studies I–III are presented in this chapter. Sub-study I revealed positive connection between counseling skills and client’s increased heart rate variability. Sub-study II showed that social skills were connected to lower study burnout and higher study engagement. Sub-study III indicates a positive connection between different dimensions of social support and work engagement. Results are presented more specifically in the following sub-chapters.

4.1 The analysis of association between counseling skills and client’s heart rate variability (Study I)

The association between counseling skills of the counselor and client’s heart rate variability reveal a positive correlation ($r = 0.69$, $p = 0.05$) between SVRS scores and an increase in high frequency, and a negative correlation ($r = -0.71$, $p = 0.05$) between SVRS scores and a decrease in low frequency. Dimension of SVRS, client-centeredness, and consistency were strongly associated ($r = 0.68$, $p = 0.03$). Low frequency was associated with both the dimensions, client-centeredness ($r = -0.74$, $p = 0.02$), and consistency ($r = -0.66$, $p = 0.04$). High frequency correlated with consistency ($r = 0.65$, $p = 0.04$), but the association with client-centeredness was not statistically significant ($r = 0.58$, $p = 0.08$). Results indicate that high scores on SVRS correlated with increment in parasympathetic activity and decrement in sympathetic activity, whereas low scores on SVRS correlated with decrement in parasympathetic activity and increment in sympathetic activity (see Table 3).

During a skilled counseling session, sympathetic dominance turned into a parasympathetic dominance. These preliminary results draw an assumption about the role of counseling skills in the client’s heart rate variability. This can be seen in emotional level as enhanced attention, effective emotion regulation, and feeling of safety, as well as relaxation in clients. Study I also showed that clients’ emotional expressions were connected to high scores on SVRS and positive ANS change, reporting that skillful counseling produced more emotional expressions by client.
Table 3. Counseling skills (SVRS) and client’s autonomic nervous system change in low frequency and in high frequency.

<table>
<thead>
<tr>
<th>Pair</th>
<th>SVRS scores</th>
<th>LF_D¹</th>
<th>SVRS scores</th>
<th>HF_D²</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10</td>
<td>35.60</td>
<td>10</td>
<td>-42.60</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>33.70</td>
<td>5</td>
<td>-4.60</td>
</tr>
<tr>
<td>3</td>
<td>9</td>
<td>-7.00</td>
<td>9</td>
<td>-4.60</td>
</tr>
<tr>
<td>4</td>
<td>11</td>
<td>12.40</td>
<td>11</td>
<td>160</td>
</tr>
<tr>
<td>5</td>
<td>9</td>
<td>16.90</td>
<td>9</td>
<td>-18.80</td>
</tr>
<tr>
<td>6</td>
<td>12</td>
<td>0.20</td>
<td>12</td>
<td>0.00</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>0.90</td>
<td>7</td>
<td>-25.30</td>
</tr>
<tr>
<td>8</td>
<td>6</td>
<td>4.80</td>
<td>6</td>
<td>-16.50</td>
</tr>
<tr>
<td>9</td>
<td>16</td>
<td>-29.40</td>
<td>16</td>
<td>4.90</td>
</tr>
<tr>
<td>10</td>
<td>15</td>
<td>-16.10</td>
<td>15</td>
<td>18.60</td>
</tr>
</tbody>
</table>

¹Low frequency decrease, ²High frequency decrease

4.2 The association of social skills and study engagement and burnout (Study II)

Study II examined the role of social skills in engagement and burnout among university students. Table 4 shows the descriptive statistics of the study sample. Table 5 shows the bivariate correlations between study variables. Higher social skills correlated with lower burnout \((r = -0.31, p<.001)\) and higher engagement \((r = 0.16, p<.001)\). Higher engagement was also associated with lower study burnout \((r = -0.58, p<.001)\). Linear regression analyses (see Table 6 and 7) revealed association between higher social skills and lower burnout \((B = -0.47, p<.001)\) and higher social skills and higher engagement \((B = 0.25, p<.001)\) when adjusted for age and gender. The highest association yielded was between higher social skills and lower cynicism \((B = -0.67, p<.001)\) and higher social skills and dedication \((B = 0.46, p<.001)\). Social skills explained 13% of variation in burnout and 6% of variation in engagement. Higher study engagement was also correlated with lower study burnout when adjusted for age and gender \((B = -0.63, p<.001)\) (see Table 8). We also adjusted for social skills to analyze whether social skills explained the relationship between engagement and burnout, and the association remained significant.
Table 4. Descriptive statistics of the study sample.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>24.26</td>
<td>5.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>251</td>
<td>70.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>74</td>
<td>29.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study engagement (1–6)</td>
<td>4.02</td>
<td>0.77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vigor (1–6)</td>
<td>3.94</td>
<td>0.84</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dedication (1–6)</td>
<td>4.56</td>
<td>0.84</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absorption (1–6)</td>
<td>3.57</td>
<td>0.92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study burnout (1–6)</td>
<td>2.64</td>
<td>0.82</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhaustion (1–6)</td>
<td>2.95</td>
<td>0.92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cynicism (1–6)</td>
<td>1.96</td>
<td>0.96</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inefficacy (1–6)</td>
<td>3.00</td>
<td>1.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social skills (1–6)</td>
<td>4.56</td>
<td>0.65</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 Standard deviation

Table 5. Bivariate correlations between study variables (N = 319–351).

<table>
<thead>
<tr>
<th>Variable</th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
<th>7.</th>
<th>8.</th>
<th>9.</th>
<th>10.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.Gender</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.Age</td>
<td>-.12</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.Social skills</td>
<td>.11</td>
<td>-.19</td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.Study engagement</td>
<td>.12</td>
<td>.24</td>
<td>.19</td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.Vigor</td>
<td>.08</td>
<td>.15</td>
<td>.18</td>
<td>.90</td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.Dedication</td>
<td>-.15</td>
<td>.21</td>
<td>.26</td>
<td>.88</td>
<td>.71</td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.Absorption</td>
<td>.10</td>
<td>.27</td>
<td>.08</td>
<td>.88</td>
<td>.70</td>
<td>.64</td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.Study burnout</td>
<td>-.03</td>
<td>.13</td>
<td>-.31</td>
<td>-.58</td>
<td>.60</td>
<td>.51</td>
<td>.42</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9.Exhaustion</td>
<td>-.03</td>
<td>-.12</td>
<td>-.17</td>
<td>-.26</td>
<td>-.35</td>
<td>-.22</td>
<td>-.19</td>
<td>.76</td>
<td>.56</td>
<td>1</td>
</tr>
<tr>
<td>10.Cynicism</td>
<td>-.15</td>
<td>-.07</td>
<td>-.35</td>
<td>-.61</td>
<td>.59</td>
<td>.62</td>
<td>.42</td>
<td>.80</td>
<td>.40</td>
<td>3</td>
</tr>
<tr>
<td>11.Inefficacy</td>
<td>.00</td>
<td>-.12</td>
<td>-.24</td>
<td>-.50</td>
<td>-.51</td>
<td>-.41</td>
<td>-.41</td>
<td>.87</td>
<td>.54</td>
<td>.56</td>
</tr>
</tbody>
</table>

1 (male = 0, female = 1), 2 p<0.05, 3 p<0.01
Table 6. Results of linear regression analyses of social skills with student burnout. Gender and age were used as control variables (N = 286).

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Study burnout</th>
<th>Exhaustion</th>
<th>Cynicism</th>
<th>Inefficacy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B&lt;sup&gt;1&lt;/sup&gt;</td>
<td>SE&lt;sup&gt;2&lt;/sup&gt;</td>
<td>AdjR&lt;sup&gt;3&lt;/sup&gt;</td>
<td>ChR&lt;sup&gt;4&lt;/sup&gt;</td>
</tr>
<tr>
<td>Social skills</td>
<td>-0.47</td>
<td>0.08</td>
<td>0.13</td>
<td>0.13</td>
</tr>
<tr>
<td></td>
<td>B&lt;sup&gt;1&lt;/sup&gt;</td>
<td>SE&lt;sup&gt;2&lt;/sup&gt;</td>
<td>AdjR&lt;sup&gt;3&lt;/sup&gt;</td>
<td>ChR&lt;sup&gt;4&lt;/sup&gt;</td>
</tr>
<tr>
<td>Social skills</td>
<td>-0.26</td>
<td>0.09</td>
<td>0.03</td>
<td>0.03</td>
</tr>
<tr>
<td></td>
<td>-0.67</td>
<td>0.09</td>
<td>0.18</td>
<td>0.17</td>
</tr>
<tr>
<td></td>
<td>-0.56</td>
<td>0.10</td>
<td>0.09</td>
<td>0.09</td>
</tr>
</tbody>
</table>

Table 7. Results of linear regression analyses of social skills with student engagement. Gender and age were used as control variables (N = 286).

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Study engagement</th>
<th>Vigor</th>
<th>Dedication</th>
<th>Absorption</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B&lt;sup&gt;1&lt;/sup&gt;</td>
<td>SE&lt;sup&gt;2&lt;/sup&gt;</td>
<td>AdjR&lt;sup&gt;3&lt;/sup&gt;</td>
<td>ChR&lt;sup&gt;4&lt;/sup&gt;</td>
</tr>
<tr>
<td>Social skills</td>
<td>0.25</td>
<td>0.07</td>
<td>0.12</td>
<td>0.06</td>
</tr>
<tr>
<td></td>
<td>0.28</td>
<td>0.08</td>
<td>0.05</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>0.46</td>
<td>0.08</td>
<td>0.16</td>
<td>0.11</td>
</tr>
<tr>
<td></td>
<td>0.19</td>
<td>0.08</td>
<td>0.09</td>
<td>0.02</td>
</tr>
</tbody>
</table>

<sup>1</sup> Unstandardized beta, <sup>2</sup> Standard error, <sup>3</sup> Adjusted R-squared, <sup>4</sup> R-squared change
Table 8. Results of linear regression analyses of study engagement with study burnout.

<table>
<thead>
<tr>
<th>Model</th>
<th>B³</th>
<th>SE⁴</th>
<th>AdjR²</th>
<th>ChR²</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1¹</td>
<td>-0.63</td>
<td>0.05</td>
<td>0.33</td>
<td>0.32</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Model 2²</td>
<td>-0.58</td>
<td>0.06</td>
<td>0.24</td>
<td>0.24</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

¹ Gender and age were used as control variables (n = 314),
² Gender, age, and social skills were used as control variables (n = 286),
³ Unstandardized beta, ⁴ Standard error, ⁵ Adjusted R-squared, ⁶ R-squared change

4.3 The role of social support in the experience of work engagement (Study III)

Study III investigated the association between different dimensions of social support for work engagement. The descriptive statistics of the study variables are presented in Table 9. All the dimensions of work engagement were positively correlated. Control variables, education, and occupational status were positively associated. Supervisory support also correlated with higher collegial social support.

The results of linear regression analyses when predicting work engagement by social support are presented in Table 10. Social support was associated with work engagement (B = 0.50, p<.001) and its subdimensions, vigor (B = 0.46, p<.001), dedication (B = 0.54, p<.001) and absorption (B = 0.40, p<.001). Social support at work was positively associated with work engagement and its subdimensions (B = 0.36, p<.001, B = 0.33, p<.001, B = 0.39, p<.001, B = 0.30, p<.001) as well as social support in private life with work engagement and its subdimensions (B = 0.35, p<.001, B = 0.33, p<.001, B = 0.37, p<.001, B = 0.27, p<.001). Social support at work was divided into supervisory and collegial social support. Supervisory social support was associated with work engagement (B = 0.30, p<.001), vigor (B = 0.28, p<.001), dedication (B = 0.33, p<.001), and absorption (B = 0.26, p<.001). Collegial social support was also positively associated with work engagement (B = 0.27, p<.001), vigor (B = 0.27, p<.001), dedication (B = 0.30, p<.001), and absorption (B = 0.22, p<.001). The variation in work engagement in Model 1 was explained by social support from 2% to 9%.

In the fully adjusted model (see Table 10, adjusted for gender, marital status, education, job strain, effort-reward imbalance), all the associations between social support and work engagement remained significant and positive. Social support explained 2–5% of the variation in work engagement.
In further analyses, we examined whether social support at work and social support in private were connected to work engagement independently (see Table 11). High social support at work was associated with work engagement ($B = 0.25$, $p<.001$), vigor ($B = 0.26$, $p<.001$), dedication ($B = 0.32$, $p<.001$), and absorption ($B = 0.25$, $p<.001$) when adjusted for gender and social support in one’s private life. When controversially adjusted for gender and social support at work, higher social support in one’s private life was connected to higher work engagement ($B = 0.20$, $p<.001$), vigor ($B = 0.19$, $p<.001$), dedication ($B = 0.20$, $p<.001$), and absorption ($B = 0.14$, $p<.001$). All the results remained significant in fully adjusted models (adjusted for gender, marital status, education, socioeconomic status, job strain, and effort-reward imbalance) as well. Social support explained 1–3% of the variation in work engagement.

We also checked whether job strain and effort-reward imbalance moderate the association between social support and work engagement (see Table 12). Adjusting for gender, job strain showed a moderating effect for social support with the subdimension of work engagement as dedication ($B = 0.14$, $p<0.05$), but the effect with other subdimensions of work engagement were not statistically significant. Adjusting as well for gender, effort-reward imbalance had a moderating effect on work engagement ($B = 0.21$, $p<0.05$) and also with all the subscales of work engagement vigor ($B = 0.16$, $p<0.05$), dedication ($B = 0.20$, $p<0.05$), and absorption ($B = 0.28$, $p<0.05$). The results of the interaction analyses show that the association between social support and work engagement is stronger at high levels of work stress. In the fully adjusted model (adjusted for gender, marital status, education, socioeconomic status, social support, and either job strain or effort-reward imbalance), the results remained significant except for the moderate effect of effort-reward imbalance on the association of social support with vigor.
Table 9. Descriptive statistics of the study sample (N = 5,259–5,376).

<table>
<thead>
<tr>
<th>Variable (range)</th>
<th>Mean</th>
<th>SD(^1)</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td></td>
<td></td>
<td>2,543 (47.3%)</td>
</tr>
<tr>
<td>Women</td>
<td></td>
<td></td>
<td>2,833 (52.7%)</td>
</tr>
<tr>
<td>Marital status (0–1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not in a relationship</td>
<td></td>
<td></td>
<td>1,058 (19.7%)</td>
</tr>
<tr>
<td>In a relationship</td>
<td></td>
<td></td>
<td>4,228 (78.6%)</td>
</tr>
<tr>
<td>Education (1–3)</td>
<td>2.25</td>
<td>0.51</td>
<td></td>
</tr>
<tr>
<td>Occupational status (1–3)</td>
<td>1.79</td>
<td>0.81</td>
<td></td>
</tr>
<tr>
<td>Job strain (1–5)</td>
<td>1.15</td>
<td>0.22</td>
<td></td>
</tr>
<tr>
<td>Effort-reward imbalance (1–4)</td>
<td>1.20</td>
<td>0.53</td>
<td></td>
</tr>
<tr>
<td>Work engagement (0–6)</td>
<td>4.67</td>
<td>1.19</td>
<td></td>
</tr>
<tr>
<td>Vigor (0–6)</td>
<td>4.71</td>
<td>1.18</td>
<td></td>
</tr>
<tr>
<td>Dedication (0–6)</td>
<td>4.62</td>
<td>1.32</td>
<td></td>
</tr>
<tr>
<td>Absorption (0–6)</td>
<td>4.42</td>
<td>1.40</td>
<td></td>
</tr>
<tr>
<td>Social support (1–5)</td>
<td>3.11</td>
<td>0.68</td>
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</tr>
<tr>
<td>Social support private life (1–5)</td>
<td>3.84</td>
<td>0.81</td>
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<tr>
<td>Social support at work (1–5)</td>
<td>2.95</td>
<td>0.97</td>
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<tr>
<td>Supervisory social support (1–5)</td>
<td>2.67</td>
<td>1.14</td>
<td></td>
</tr>
<tr>
<td>Collegial social support (1–5)</td>
<td>3.21</td>
<td>1.05</td>
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</tbody>
</table>

\(^1\) Standard deviation
Table 10. Results of gender and fully adjusted linear regression analyses of social support (S) with work engagement.

<table>
<thead>
<tr>
<th>Models</th>
<th>Work engagement</th>
<th>Subscales of work engagement</th>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>B(^{13})</td>
<td>SE(^{14})</td>
<td>AdjR(^{15})</td>
<td>B</td>
<td>SE</td>
<td>AdjR</td>
<td>B</td>
</tr>
<tr>
<td>Model 1</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S sum(^2)</td>
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<td>0.50</td>
<td>0.02</td>
<td>0.09</td>
<td>0.46</td>
<td>0.02</td>
<td>0.08</td>
<td>0.54</td>
</tr>
<tr>
<td>S private life(^3)</td>
<td></td>
<td>0.35</td>
<td>0.02</td>
<td>0.07</td>
<td>0.33</td>
<td>0.02</td>
<td>0.06</td>
<td>0.37</td>
</tr>
<tr>
<td>S work(^4)</td>
<td></td>
<td>0.36</td>
<td>0.02</td>
<td>0.10</td>
<td>0.33</td>
<td>0.02</td>
<td>0.09</td>
<td>0.39</td>
</tr>
<tr>
<td>S supervisory(^5)</td>
<td></td>
<td>0.30</td>
<td>0.01</td>
<td>0.10</td>
<td>0.28</td>
<td>0.01</td>
<td>0.08</td>
<td>0.33</td>
</tr>
<tr>
<td>S collegial(^6)</td>
<td></td>
<td>0.27</td>
<td>0.02</td>
<td>0.07</td>
<td>0.27</td>
<td>0.02</td>
<td>0.06</td>
<td>0.30</td>
</tr>
<tr>
<td>Model 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>S sum(^8)</td>
<td></td>
<td>0.39</td>
<td>0.02</td>
<td>0.19</td>
<td>0.36</td>
<td>0.02</td>
<td>0.16</td>
<td>0.44</td>
</tr>
<tr>
<td>S private life(^9)</td>
<td></td>
<td>0.27</td>
<td>0.02</td>
<td>0.18</td>
<td>0.26</td>
<td>0.02</td>
<td>0.16</td>
<td>0.29</td>
</tr>
<tr>
<td>S work(^{10})</td>
<td></td>
<td>0.28</td>
<td>0.02</td>
<td>0.19</td>
<td>0.25</td>
<td>0.02</td>
<td>0.17</td>
<td>0.31</td>
</tr>
<tr>
<td>S supervisory(^{11})</td>
<td></td>
<td>0.22</td>
<td>0.01</td>
<td>0.19</td>
<td>0.20</td>
<td>0.01</td>
<td>0.16</td>
<td>0.24</td>
</tr>
<tr>
<td>S collegial(^{12})</td>
<td></td>
<td>0.23</td>
<td>0.01</td>
<td>0.18</td>
<td>0.20</td>
<td>0.02</td>
<td>0.16</td>
<td>0.26</td>
</tr>
</tbody>
</table>

\(^1\) Gender was used as control variable, \(^2\)(n = 5,246–5,250), \(^3\)(n = 5,245–5,146), \(^4\)(n = 5,231–5,232), \(^5\)(n = 5,148–5,150), \(^6\)(n = 5,232–5,233),

\(^7\) Gender, marital status, education, socioeconomic status, job strain, and effort-reward imbalance were used as control variables, \(^8\)(n = 5,141–5,143),

\(^9\)(n = 5,137–5,138), \(^10\)(n = 5,120–5,122), \(^11\)(n = 5,041–5,043), \(^12\)(n = 5,123–5,124), \(^13\)Unstandardized beta, \(^14\)Standard error, \(^15\)Adjusted R-squared, \(^16\)p<0.001
Table 11. Results of gender and fully adjusted linear regression analyses when investigating the independent associations of social support (S) at work, and in one’s private life, with work engagement.

<table>
<thead>
<tr>
<th>Models</th>
<th>Work engagement</th>
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<th></th>
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<tr>
<td></td>
<td>B</td>
<td>SE</td>
<td>AdjR</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>S work</td>
<td>0.25</td>
<td>0.02</td>
<td>0.06</td>
<td>0.26</td>
<td>0.02</td>
<td>0.10</td>
<td>0.32</td>
<td>0.02</td>
<td>0.11</td>
<td>0.25</td>
<td>0.02</td>
<td>0.06</td>
</tr>
<tr>
<td>S private life</td>
<td>0.20</td>
<td>0.02</td>
<td>0.11</td>
<td>0.19</td>
<td>0.02</td>
<td>0.10</td>
<td>0.20</td>
<td>0.02</td>
<td>0.11</td>
<td>0.14</td>
<td>0.03</td>
<td>0.06</td>
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<td>Model 4</td>
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<tr>
<td>S work</td>
<td>0.23</td>
<td>0.02</td>
<td>0.20</td>
<td>0.20</td>
<td>0.02</td>
<td>0.18</td>
<td>0.26</td>
<td>0.02</td>
<td>0.19</td>
<td>0.21</td>
<td>0.02</td>
<td>0.11</td>
</tr>
<tr>
<td>S private life</td>
<td>0.16</td>
<td>0.02</td>
<td>0.18</td>
<td>0.16</td>
<td>0.02</td>
<td>0.19</td>
<td>0.16</td>
<td>0.02</td>
<td>0.19</td>
<td>0.12</td>
<td>0.03</td>
<td>0.11</td>
</tr>
</tbody>
</table>

1 Gender, social support at work, and social support in one’s private life were used as control variables (n = 5,226).
2 Gender, marital status, education, socioeconomic status, job strain, and effort-reward imbalance were used as control variables (n = 5,118–5,119).
3 Unstandardized beta, 4 Standard error, 5 Adjusted R-squared, 6 p<0.001
Table 12. Results of gender and fully adjusted linear regression analyses when investigating the independent associations of job strain and effort-reward imbalance interaction with social support (S) for work engagement.

<table>
<thead>
<tr>
<th>Model</th>
<th>Subscales of work engagement</th>
<th>Work engagement</th>
<th>Vigor</th>
<th>Dedication</th>
<th>Absorption</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>B</td>
<td>SE</td>
<td>AdjR</td>
<td>B</td>
</tr>
<tr>
<td>Model 5</td>
<td>S * job strain&lt;sup&gt;1&lt;/sup&gt;</td>
<td></td>
<td>0.11</td>
<td>1.11</td>
<td>0.11</td>
</tr>
<tr>
<td></td>
<td>S * ERI&lt;sup&gt;2, 3&lt;/sup&gt;</td>
<td></td>
<td>0.21&lt;sup&gt;10&lt;/sup&gt;</td>
<td>1.13</td>
<td>0.09</td>
</tr>
<tr>
<td>Model 6</td>
<td>S * job strain&lt;sup&gt;4&lt;/sup&gt;</td>
<td></td>
<td>0.10</td>
<td>0.06</td>
<td>0.12</td>
</tr>
<tr>
<td></td>
<td>S * ERI&lt;sup&gt;5&lt;/sup&gt;</td>
<td></td>
<td>0.19&lt;sup&gt;9&lt;/sup&gt;</td>
<td>0.08</td>
<td>0.11</td>
</tr>
</tbody>
</table>

<sup>1</sup> Gender, social support, and job strain were used as control variables (n = 5,232),
<sup>2</sup> Effort-reward imbalance, <sup>3</sup> Gender, social support, and effort-reward imbalance were used as control variables (n = 5,242),
<sup>4</sup> Gender, marital status, education, socioeconomic status, job strain, and social support were used as control variables (n = 5,154),
<sup>5</sup> Gender, marital status, education, socioeconomic status, effort-reward imbalance, and social support were used as control variables (n = 5,143),
<sup>6</sup> Unstandardized beta, <sup>7</sup> Standard error, <sup>8</sup> Adjusted R-squared, <sup>9</sup> p<0.05, <sup>10</sup>p<0.01
5 Discussion

The results of the three studies revealed that counseling skills are associated with increased parasympathetic activity and decreased sympathetic activity in the client’s autonomic nervous system action. Client-centeredness and consistency were correlated to positive emotional change in the client at the end of the counseling session; this indicates that the client was less stressed and more relaxed at the end of the counseling session when the counselor’s counseling skill level was high. A counseling session with high scores in counseling skills resulted in more emotional expressions in the client’s speech than a session with lower scores in counseling skills. Our results support counseling and psychotherapy research that suggests client-centeredness plays a crucial role in counseling outcomes (Orlinsky, Ronnestad & Willutzki, 2004).

Social skills were associated with higher engagement and lower burnout among university students. They also correlated positively with the subdimensions of study engagement: vigor, dedication, and absorption. They correlated negatively with the subdimensions of study burnout: exhaustion, cynicism, and inefficacy. Engagement was also negatively correlated with burnout among university students. The study shows that social skills may play an important role in a student’s well-being in terms of engagement and burnout.

Social support at work was related to higher work engagement and its subdimensions (vigor, dedication, and absorption) in middle age. In addition, social support in private life was linked to higher work engagement and its subdimensions. Both collegial and supervisory support were related to higher work engagement and its subdimensions. Additionally, work stress modified the association between social support and work engagement; social support showed stronger associations with work engagement in jobs with higher job strain than it did for those with lower job strain. Accordingly, social support plays a more beneficial role when an individual is stressed at work. Moreover, social support may act as a potential resource for work engagement.

Overall, the results of this study suggest paying attention to the social interactions taking place in different circumstances, from counseling interaction to study environment and working life. The main findings of the study are presented in Figure 3. Developing such skills may offer ways to increase psychological well-being in terms of emotional well-being, engagement, and burnout.
5.1 The association between counseling skills and client’s heart rate variability

Study I showed that high counseling skills were connected to changes in the client’s heart rate variability as we hypothesized. High counseling skills were associated with a decrease in sympathetic activity and an increase in parasympathetic activity in the autonomic nervous system. Higher counseling skills increased HRV and parasympathetic activity, which implies an increase in positive emotions, as positive emotions seem to be associated with increased HRV (Duarte & Pinto-Gouveia, 2017).

The link between HRV and emotions also emphasizes that better emotion regulation and emotional well-being are associated with higher HRV (Mather & Thayer, 2018); our study also supports this. Emotion regulation can be seen in autonomic nervous changes; effective emotion regulation increases HRV while poor regulation decreases it (Applenhans & Luecken, 2006); our study shows that skillful counseling is associated with the increase in HRV that is also connected to
better emotion regulation. HRV is an indicator of psychological well-being; increased HRV is linked to emotional and psychological well-being, while a reduction in HRV is typical when the individual is suffering from distress (Mather & Thayer, 2008; Montano et al., 2009). An increase in HRV is also associated with lower levels of negative emotions, such as anxiety or depression (Paniccia, Paniccia, Thomas, Taha & Reed, 2017). The goal of the counseling session in our study was to create positive emotional changes in the clients. HRV offered a very adequate tool for observing emotional changes at the physiological level (Appelhans & Luecken, 2006). As prior studies have shown the impact of emotions and emotion regulation on HRV, it is worth acknowledging the lack of scientific agreement about the linkage between HRV and emotions. A review study reports the limitations of the distinct link between HRV and emotions (Kreibig, 2010). Autonomic nervous system changes are not automatically outcomes of emotional changes in terms of discrete emotions but refer more to the arousal level of emotions (Kreibig, 2010). Another important feature that modifies the relationship between HRV and emotions is respiratory sinus arrhythmia (Grossman & Taylor, 2007). Nevertheless, the results of our study show that, in general, HRV is an effective indicator of emotional changes during a counseling session.

Clients’ emotional expressions were found to be a differentiative factor between high counseling skills and low counseling skills. Our findings support earlier research which found that a counseling session that includes more emotional expressions by the client is related to the effectiveness of counseling (Horvarth & Symonds, 1991; Orlinsky et al., 1994; Rantanen & Soini, 2013). Wiser and Goldfried (1993) also point out that emotional experiences are related to psychotherapy outcome.

Our study could draw preliminary results about the association between counseling skills and a client’s heart rate variability. Heart rate variability has hardly been utilized in counseling research, so our study gives an important insight that counseling skills are linked to clients’ well-being indicators even at the psychophysiological level in a brief counseling interaction situation. There is a need for further studies to support our results and explain the association more specifically.
5.2 The role of social skills in engagement and burnout among university students

Study II showed that higher social skills were associated with lower burnout and higher engagement among university students as hypothesized and presented in Figure 3 (p. 64) the main findings of the study. Higher engagement was also associated with lower burnout, as shown in earlier studies as well (Schaufeli et al., 2002).

Social skills may have a significant role in study engagement among university students, but it has not yet been largely investigated. Social skills are shown to enhance social support, which is related to school and classroom engagement (Wang & Eccles, 2012), and social skills play an important role in student well-being in general (Emadpoor, Lavasani & Shahcheragi, 2016; Malinauskas, Lupisiene & Lapeniene, 2014). In the literature, the concept of engagement varies widely, from student engagement to student engagement in academic work (Alrashidi et al., 2016); in this study, we concentrated on study engagement presented by Schaufeli et al. (2002b). Across all the different definitions of the concept, the common idea is to describe the degree to which a student is engaged in studies and experiencing positive emotions and the motivation to study (Schaufeli et al., 2002b).

Our study supports earlier research findings that higher social skills are related to lower burnout (Pereira-Lima & Loureiro, 2015), and correspondingly, we could show that lower social skills are associated with the risk of burnout. A previous study indicates that poor social skills may influence the development of depression or that depression can result in poor social skills, and that poor social skills may also act as a vulnerability factor increasing the risk of depression (Segrin, 2000).

More specifically, our study revealed that social skills were connected to the three dimensions of burnout: exhaustion, cynicism, and inefficacy, but the largest association was drawn with cynicism. Cynicism is related to negative and less sympathetic (Smith & Frohm, 1985) social interaction and cynical attitudes can lead to social conflicts (Kahlert et al., 2012). Dedication showed the strongest association with higher social skills of the engagement dimensions. A previous study demonstrated that dedication is linked to commitment in social relationships (Givertz, Segrin & Hanzal, 2009). Social skills are shown to be associated with life satisfaction, stress regulation and decreased risk of depression, which are effective ways to increase psychological well-being (Segrin & Taylor, 2007).
Our findings about the negative correlation between engagement and burnout support earlier findings (Schaufeli et al., 2002), and our study also supports the Job Demands-Resources theory defining engagement and burnout as parallel and negatively associated processes (Schaufeli & Bakker, 2004). Engagement seems to buffer the risk of burnout in the study environment as well as in workplaces, as proposed in JD-R theory (Civitsi, 2015; Emadpoor et al., 2016; Schaufeli et al., 2002a).

Overall, our findings promote earlier research showing that social skills have a role in students’ well-being and should be regarded more carefully in higher education. Our results suggest acknowledging the importance of social relationships and social skills in degree programs and in higher education in general in order to increase engagement and decrease burnout among university students, but further studies are needed to draw definite conclusions, especially as our cross-sectional findings do not give information on whether social skills actually affect engagement and burnout.

5.3 The role of social support in the experience of work engagement

Our results from a large cohort-based study drew association between social support and higher total work engagement and its sub-dimensions, vigor, dedication, and absorption in middle age as shown in Figure 3 (p. 64) the main findings of the study. The results support our hypothesis. We could also show that even social support in private life has a notable impact on work engagement and, as far as we know, has not been examined previously. We also found that various dimensions of social support, such as high social support at work, high supervisory social support, high collegial social support, and high social support in private life, were connected to higher work engagement. However, social support could not explain a large amount of the variation in work engagement, which suggests that other factors are connected to work engagement in addition to social support. Work engagement is described as a motivational and emotional state of mind with its roots in psychological presence (Kahn, 1992) as being fully there and extending to the sense of significance (Schaufeli et al., 2002b). Nowadays, the sources for work motivation are related to subjective well-being instead of to, for example, salary and money (Seligman, 2002). Social relationships form one criterion for happiness (Seligman, 2002); social support could also act as a significant resource in work engagement.
Social support at work explained more of the variation in engagement than social support in one’s private life. Our results are in line with earlier research and theory about the relationship between higher social support and higher work engagement (Caesens et al., 2014; Bakker & Demerouti, 2007; Nasurdin et al., 2018; Orgambidez-Ramos & Almeida, 2017; Othman & Nasurdin, 2013; Taipale et al., 2011). Our results also support previous studies that found social support to boost general well-being at work (Bakker & Xanthopoulou, 2013; Liu, Li, Ling & Cai, 2016; Sarason, Pierce & Sarason, 1990). Our study may provide more generalizable information about the association between social support and work engagement based on our large cohort-based sample.

Among the sub-dimensions of work engagement, dedication and vigor yielded the strongest associations with social support. Social support is one significant job resource that specifically promotes dedication (Bakker et al., 2004) and vigor (Blanco-Donoso et al., 2016). The definition of dedication encompasses enthusiasm, a sense of significance, and the possession of a strong involvement in one’s job (Schaufeli et al., 2002b), and it is logical that social support would draw the strongest association to dedication. The receipt of support helps an individual dedicate time and energy to work if that work is valued at home and at work (Rafferty & Griffin, 2004).

Supervisory and collegial social support drew similar associations with work engagement. Prior studies have been indicating more about supervisory support than collegial support in the experience of work engagement (Bakker, Hakanen, Demerouti & Xanthapoulou, 2007), so our finding is a new contribution to earlier studies.

Supervisory social support has been proposed to be connected to job satisfaction and commitment to work (Ugur & Emin, 2010) and thereby to reduce turnover intention (Fukui, Wu & Salyes, 2019). Supervisory support can also help to maintain work and family balance (Jang, 2009). Sources of social support, such as those offered in private life and at work, seem to be important in terms of work and family balance (van Daalen et al., 2016). Supervisory and overall supportive culture in an organization indicates flexibility and understanding of employees’ family needs and demands (Jang, 2009) and is related to reducing work-to-family conflict by time domain and family-to-work conflict by strain domain (van Daalen et al., 2016).

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and is related to reducing work-to-family conflict by time domain and family-to-work conflict by strain domain (van Daalen et al., 2016).

Supervisory support has been paid more attention in research than collegial social support, as there are many indicators supporting the role of supervisory social support in job satisfaction and affective commitment (Ugur & Emin, 2010), in reducing turnover intention (Fukui, Wu & Salyes, 2019), and also in maintaining work and family balance (Jang, 2009). Even though supervisory social support has been shown to have a great impact on employee engagement, peer and collegial support have a significant role in employee engagement as well. Xanthopoulou, Baker, Heuven, Demerouti and Schaufeli (2008) showed that collegial support influences employees’ work attitudes. Collegial social support can also be related to spillover influence from one co-worker to another; work engagement can crossover in teams between colleagues (Ten Brummelhuis, Bakker & Euwema, 2010). Fluent and close interaction between colleagues is shown to enhance crossover of work engagement (Bakker & Xanthopoulou, 2009). Our results support these earlier findings of supervisory and collegial social support’s effect on work engagement, but the results should be confirmed in longitudinal studies.

We also could draw preliminary results that job strain and effort-reward imbalance moderated the association between social support and work engagement. Job strain moderated only the association between social support and dedication, but effort-reward imbalance moderated all the associations between social support and work engagement and with all the sub-dimensions. It seems that the association of social support with work engagement is stronger in jobs with high work stress. Prior findings also show that job resources, such as social support, boost work engagement, especially when job demands are high (Bakker et al., 2007). Bakker et al. (2007) reported in their study of Finnish teachers that supervisory support among other things helps them cope with demanding interactions with students.

Even though the role of social support in one’s private life has not been widely regarded, there is some related evidence from research on work and family balance. Research on work and family balance has focused on both negative and positive spillover influences from home to work and from work to home (Mennino, Rubin & Breifield, 2005). Another research branch has focused on the conflict between work and family roles (Ismail & Nordin, 2012; Nurmayanti, Thoyib & Irawanto, 2014), which negatively influences work engagement. On the other hand, work engagement can have a negative impact on family-work balance, as highly engaged employees may tend to work too much and sacrifice their family time for work (Halbesleben, Harvey & Bolino, 2009). The JD-R model perceives the crossover
influences between co-workers (Hakanen & Lindbohm, 2008) and even between spouses (Bakker & Demerouti, 2009), so it already reaches different areas of people’s lives, but the effects of private life social support on the different dimensions of work engagement still need to be studied further.

5.4 Methodological considerations

There were several limitations in this study. The first limitation relates to the homogenous and relatively small sample in sub-studies I and II. Even though Study I was based on a laboratory setting and video-based analysis, it would be fruitful to examine the association between counseling skills and clients’ heart rate variability in a larger sample and draw more confident associations. In the laboratory setting, we could limit the intervening variables, but one limitation was the lack of control variables. HRV can be intervened very easily, even though it provides an accurate tool for measuring ANS change. There are other instruments, such as electroencephalography (EEG; see Niedermeyer & Silva, 2004), electrocardiography (EC; see Brentson, Quigley & Lozano, 2007) or galvanic skin response (GSR; see Montagu & Coles, 1966) that can acquire more information about emotional functioning in counseling sessions and other interactional situations and could be used in further studies. The sample of university students is rather homogenous, and the year of studies can possible be an intervening variable that should be either controlled for or investigated more. The year of studies was asked in our questionnaires but there were so many missing values that we removed it from our analysis.

This study uses multimethodology, which can limit a study or lend it strength, depending on how the study is executed and the combination of the different methods. In this study, different methods brought insight into the examined phenomena because psychophysiological measurements provide objective information about emotional states, qualitative analysis offers deeper observation about the contents of the speech, and quantitative analysis affords generalizability about the associations between study variables. In addition, large population-based data, covering all branches of working life in the public and private sectors, make the resulting social support and work engagement variables generalizable. Multimethodology can afford diverse and comprehensive points of view of the examined research object and thus lend strength to this study. One important argument for using multimethodology is based on the key research variables related to the complex phenomenon of social interaction (Greene, 2007).
Self-report surveys used in the study for our variables include the risk of common method variance problems (Podsakoff, McKenzie, Lee & Podsakoff, 2003). However, common method variance is not automatically a source of bias, and prior studies have pointed out that common method variance does not affect the results as much as has been proposed (Spector, 2006).

Self-report surveys provide an important way to examine subjective experiences, and some variables cannot be examined by using other methods. Large data were needed to make preliminary generalizable associations between study variables, so that the use of laboratory settings for studies II and III was excluded. Well-validated self-report surveys still provide strength for this study, however. Surveys of engagement and burnout are well-validated and widely tested (Salmela-Aro et al., 2009; Schaufeli et al., 2002a, 2002b), as is Sarason’s social support questionnaire (Sarason et al., 1987). However, social support could be examined using other validated measures, as some newer validated surveys exist as well (Karasek & Theorell, 1990; Shaw, Krause, Liang & Bennet, 2007). Sarason’s questionnaire is still widely used and cited in literature related to social support; it provides a strong theoretical background for the measurement of social support (e.g., Raschle, Bruchon-Schwitzer, 2005). The use of this population-based cohort data provided validity for this study, but the data did not provide any other surveys to examine social support. Nevertheless, there is a need for other measurements and research settings to add more validity to the research.

While examining the linkage between social skills and social support, it would also be very interesting to see the indirect effects on psychological well-being outcomes, but the data did not, unfortunately, offer the possibility to do that. That association needs investigation in further studies to discover more information about the variable relationship between social interaction and psychological well-being variables.

Overall, the limitations in our study are concerning the correlational design not providing information on causal relations between variables. Self-report is also a limitation in our study because self-report measures were used in both assessing predictor and outcome variables, which increases the risk of common method bias as mentioned above (Podsakoff et al., 2003). However, we used different scaling on the measures used in our study, which reduced the risk of bias (Podsakoff et al., 2003). We could still draw associations between the study variables. The cross-sectional design that we used in the present study provides important information about correlation, but for information about causal relations, further longitudinal studies should be executed.
Strengths of the present study are related firstly to the large cohort-based, non-selective population-based sample in Study III. The sample covers all the branches of work in both the public and private sectors and makes our results well-validated.

One strength of the study is to provide important information about the psychophysiology of emotions in counseling sessions. Psychophysiological measurement enables the combination of physical and psychological dimensions. The laboratory setting used in the study decreases the number of intervening variables. HRV analysis (Kubios) also considers intervening variables and includes, for example, artefact corrections and trend removal (Tarvainen et al., 2014). The PolarS810i, which we used in our study to measure RR intervals of the participants, has also been tested to be almost as effective for the HRV measurement as the ambulatory electrocardiogram to indicate R-R intervals (Weibbert et al., 2010).

HRV is an effective tool for measuring ANS changes, and it provides objectivity and strength for our study. CROS is a reliable, valid tool to assess and analyze counselors’ responses and counseling skills (Rantanen & Soini, 2013). The use of CROS video-based analysis strengthens this study because it addresses the specific features of the counseling conversation and enables them to be analyzed accurately.

The methodological strengths of the present study are related to the use of well-validated measures for the study variables. Work stress measures also provide subclinical information that does not meet the criteria for burnout syndrome. That is, the work stress measurements show important preventive information for early interventions. The study setting was well designed for the sample of university students and employees of Northern Finland birth cohort 1966 study (University of Oulu, 2020). We were able to use diverse research methods: video-based analysis, psychophysiological measures, short qualitative analysis, and statistical measures for large data.

5.5 Conclusions and practical implications

This study suggests that counseling skills are associated with a client’s heart rate variability in counseling interactions. In addition, the results showed that clients’ emotional expressions are associated with higher counseling skills. Social skills are linked to both engagement and burnout among university students. Social skills are also associated with sub-dimensions of engagement, vigor, dedication, and absorption and sub-dimensions of burnout, emotional exhaustion, cynicism, and inefficacy. The results also supported that engagement and burnout are negatively
correlated but independent dimensions. Moreover, this study revealed that social support is related to the experience of work engagement. The results showed that total social support, as well as social support at work and in one’s private life, is associated with work engagement and its sub-dimensions of vigor, dedication, and absorption. Social interaction and social relationships are worth acknowledging at work and in higher education in order to promote psychological well-being, but further longitudinal studies are needed to provide practical implications.

Counseling interaction and counseling skills are important indicators of the effectiveness of the counseling session, as well as in general interaction situations in higher education and at workplaces. Training counselors in these specific interpersonal skills should be included in counselors’ basic training as well as in basic education for all students. This training in specific interpersonal skills can be transformed in other contexts as well, such as the health care sector (doctor-patient relationship) or in organizations in general, for example, supervisor-subordinate relationships. Overall, interpersonal skills should be regarded as basic education in all fields of study because those skills are needed when entering work life.

Our study also revealed that higher social skills are associated with higher engagement and lower burnout among university students. We also replicated earlier findings that engagement and burnout are negatively correlated among university students. If our results are replicated in longitudinal studies, it can be suggested that degree programs might benefit from including and integrating practices that support learning and developing social skills. Social skills could be integrated into teaching programs, such as creating social learning spaces that can enhance the social relationships and social skills of students (Kantanis, 2000; Matthews, Andrews & Adams, 2011). Constructive teaching, social support, and teacher approachability, student and staff interaction, academic challenge, active learning, collaborative work, beyond-class collaboration, and complementary activities are essential features of a learning environment that promotes student social relationships and social skills (Coates, 2006). Pedagogic methods that improve group work and social skills should be integrated into higher education practices, such as collaborative and problem-based learning (Ahlfeldt, Metha & Sellnow, 2005; Laal, 2013).

Our study showed important insights into the role of social skills in the experience of engagement and burnout in higher education. These findings suggest that social skills and social relationships should be more highly regarded in higher education institutions in order to support students’ well-being in terms of increased engagement and decreased risk of burnout. Our results also support defining
engagement and burnout as parallel processes, meaning that paying attention to increasing engagement decreases the risk of burnout, even though the absence of burnout does not immediately mean that one is experiencing engagement. Social skills practices are worth integrating into teaching programs and students’ activities to support students’ well-being and engagement. It is worth noting that engagement seemed to be more common in the early stages of studies, and burnout was more common with students who had studied the longest (Salmela-Aro & Read, 2017). It is important to support students’ transition to university studies, but also to maintain support throughout the course of their studies. Usually, first-year students receive the most support from tutors, teachers, and counselors, but results about engagement and burnout (Salmela-Aro & Read, 2017) recommend reinforcing student support all through their academic lives.

The study about the role played by social support at work and in one’s private life in terms of work engagement provides insight into the importance of social support in various dimensions of one’s life. Collegial support and supervisory support were also related to work engagement. Our findings suggest considering social interaction and social relationships within workplaces, as it might offer a way to increase social support and increase the possibility of experiencing work engagement. The result of social support in one’s private life highlights the importance of work and family balance to be considered in workplaces. Meta-analysis shows that work-to-family enrichment and family-to-work enrichment are linked to physical and mental health (McNall, Nicklin & Masuda, 2010), so there are plenty of positive outcomes to a balanced life among employees. There are many ways to provide support for balancing family and work, such as offering employees opportunities to have flexible hours, doing remote work, and most of all, promoting a family-friendly atmosphere at workplaces (Siu et al., 2010). A positive attitude and support from the supervisor are shown to enhance work and family balance (Hakanen, Peeters & Perhoniemi, 2011; Kossek, Pichler, Bodner & Hammer, 2011). Work and life balance are emphasized also in studies that concentrate on spillover influence from one colleague to another (Bakker & Demerouti, 2008; Bakker et al., 2006) or from one spouse to another (Bakker & Demerouti, 2009). Our study supports these earlier findings, and together with previous research, it suggests taking social support into account at workplaces.

Social relationships and social support can act as significant resources for employees (Bakker, Schaufeli & Taris, 2008), so they are worth serious consideration in workplaces. Further, social support can enhance the experience of work engagement, which is related to work performance and productivity (Harter
et al., 2002). Employees’ social relationships and social support should be promoted by organizations, as well as having a family-friendly attitude, to enable both social support at work and social support in private life that are clearly related to work engagement.

Overall, our study revealed the importance of different aspects of social interaction in terms of counseling skills, social skills, and social support for psychological well-being, as indicated by burnout and engagement. Social skills increase the quality of social relationships and perceived social support, which links to increased psychological well-being. The need for belonging and attachment (Deci & Ryan, 1985) is one of the driving forces of human nature. People spend an enormous amount of our lives in educational institutions and work organizations where social interaction takes place and has an important role in one’s psychological well-being. Educational institutions and work organizations are places where those skills can and should be highly regarded and supported. The implications of sub-studies are presented more specifically in Figure 4.

In the future, the associations found in this study should be examined in longitudinal settings in order to demonstrate causal relations. Additionally, other psychophysiological measurements are needed in order to examine more about the association between social interaction skills and emotional well-being. Psychophysiological measurements could be applied to research on work engagement as preliminary results already show that work engagement is associated with heart rate variability; high work engagement increases heart rate variability, which promotes cardiovascular health (Seppälä, 2013). Larger data would also give a broader picture about the association and validate our findings. It would be interesting to elaborate further on the resources and factors affecting work engagement. It would be useful to examine the path from university student to work life in terms of engagement and burnout, and to find ways to improve students’ well-being and support their entrance to work life as well.
Practical implications

The results of this study give indications that are presented below, but because of the cross-sectional design of this study, those indications should be confirmed in longitudinal research settings.

- The study indicates that training specific interpersonal skills for counselors and students in basic education and employees in organizations may help to promote well-being.
- Integrating social skills training in teaching programs may support engagement and prevent burnout among students.
- Adapting pedagogic methods that improve group work and social skills into higher education practices (collaborative and problem-based learning) may promote student engagement and prevent burnout.
- Promoting employees’ social relationships and social support in organizations may help to promote employees’ work engagement.

Fig. 4. Practical implications of the study.
References


Original publications


Reprinted with permission from Elsevier (I), Electronic Journal of Research in Educational Psychology (II), and the Scandinavian Journal of Psychology (III).

Original publications are not included in the electronic version of the dissertation.


182. Tuomisto, Timo (2018) Kansanopistopedagogikka kolmessa kristillisessä kansasopistossa


188. Louhela, Helena (2019) Sexual violence : voiced and silenced by girls with multiple vulnerabilities

189. Ameir, Mwanakhamis (2020) Supporting active learning teaching techniques through collaborative learning and feedback in Zanziba, a challenging educational context

190. Sutela, Kaaja (2020) Exploring the possibilities of Dalcroze-based music education to foster the agency of students with special needs : a practitioner inquiry in a special school


192. Haapakoski, Jani (2020) Market exclusions and false inclusions : mapping obstacles for more ethical approaches in the internationalization of higher education


194. Sirkko, Riiikka (2020) Opettajat ammatillisina toimijoina inklusiota edistämässä

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ASSOCIATIONS OF SOCIAL SKILLS AND SOCIAL SUPPORT WITH WELL-BEING-RELATED OUTCOMES AT WORK AND IN HIGHER EDUCATION

HEART RATE VARIABILITY, ENGAGEMENT, AND BURNOUT