

Contemporary aspects of health and performance among young adult women and men in Sweden

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ABSTRACT

The overall aim of this thesis was to improve our understanding of contemporary aspects of health and performance among young adult women and men in Sweden. Cultural and structural changes in society have resulted in new environmental conditions, which in turn give rise to new potential health hazards. The constituent studies of this thesis examined three such circumstances: a) an increasing number of women studying at university, b) an increasing number of women entering educational fields and occupations traditionally dominated by men, and c) an increased focus on individual performance and the pursuit of self-esteem. Based on these aspects, my intention was to investigate: 1) early differences in health and performance between young women and men in higher education, 2) conditions related to stress and insufficient recovery among highly educated women in non-traditional women's occupations, and 3) whether performance-based self-esteem (PBSE) was a predictor of frequent sickness presenteeism among young adult women and men.

The health and performance of a sample of young adults in higher education were examined using questionnaire data. Conditions related to stress and insufficient recovery were explored qualitatively in a sample of highly educated young women working in occupations traditionally dominated by men. Performance-based self-esteem as a predictor of sickness presenteeism was examined in a population-based sample of young adults engaged in work, study, or vocational practice.

The results indicate that, although the study sample was fairly homogenous in terms of age, occupation, hierarchical level, socio-economic status, and number of children (i.e., very few had children), women had a lower prevalence of maintained health and performance over two years than did men. Despite this finding, no major differences were found in the determinants of this outcome, nor did the explanatory factors explain the observed differences. In the qualitative study, the synergy between extensive individual ambition and a context overflowing with opportunities and demands was qualitatively related to ambiguity overload, which was in turn related to perceived stress. If not handled via individual or contextual boundary setting, the respondents became stuck in a loop of stress and dysfunctional coping behaviour, obstructing the possibility of sufficient recovery. PBSE was a predictor of sickness presenteeism even when adjusting for general health, psychological demands, physical demands, economic problems, and main occupation. A synergy effect was also observed in which the effect of PBSE on sickness presenteeism was greatly increased by environmental and personal factors.

In conclusion, the constituent studies of the thesis contribute to our understanding of some contemporary aspects of health and performance by observing that: a) early differences in health and performance between young women and men existed even in a fairly homogenous study sample, b) the synergy between highly ambitious individuals and an environment overflowing with opportunities and demands was qualitatively related to ambiguity overload followed by stress and insufficient recovery among highly educated young women in non-traditional women's occupations, and c) a personality disposition in which self-esteem is dependent on performance was a predictor of potentially hazardous behaviour in the form of frequent sickness presenteeism.

Key words: young adults, gender, performance, sickness presenteeism, individualization, work ability, well-being, health, grounded theory, stress, modern society, stress, anxiety

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Original studies

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- II. Löve J, Dellve L, Eklöf M, Hagberg M. Inequalities in maintenance of health and performance between young adult women and men in higher education. *The European Journal of Public Health*, 2009; 19 (2):168–174
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“Health among young people is not only important in its own right or for their sake; it is crucial to assessing the overall state and future of nations.”

Richard Eckersley (2010), *Perspectives on Psychological Science*

List of abbreviations

EHP	Excellent health and health-related performance
PBSE	Performance-based self-esteem
SP	Sickness presenteeism
WA	Work ability
CI	Confidence interval
95% CI	95% confidence interval
PR	Prevalence ratio
OR	Odds ratio
WAYA	Work Ability Young Adults (cohort name)
H24	Health, 24 years (cohort name)

Introduction

This thesis will begin with a brief introduction to draw the big lines. However, all themes will be presented in detail and with full citations in the background section below.

According to sociologists, major societal changes in most high-income societies have brought about an increased emphasis on individualism and self-fulfilment, a heightened sense of uncertainty, and a rise in personal expectations. German sociologist Ulrich Beck has even stated that “the ethic of individual self-fulfilment and achievement is the most powerful current in modern society”. These societal changes may be particularly evident in the lives of women who, more than men, face new challenges different from those faced by earlier generations and must cope with considerably changed and expanded roles. As health is strongly related to the constant interplay between biology and the environment, these structural and cultural changes are thought to bring new potential health hazards, partly overlooked in epidemiology today. It has been suggested that these societal changes are particularly evident in the lives of young people, partly because the transition from adolescence to adulthood is itself a period when role conflicts and ambiguities can be highly stressful and difficult to manage. A de-standardization of this transition has also been observed, in which this period has not only become prolonged but also more fragmented, more diversified, and less linear.

Compared with the late 1980s, young adults in Sweden now report considerably more symptoms of mental health problems, and even at a young age young women report more symptoms than do young men. As in other age groups, the prevalence of symptoms among young people is generally higher among those of lower socio-economic status, the unemployed, and immigrants. However, in this thesis, I wanted to go beyond these better-known determinants of health and explore some contemporary conditions that might have an increased importance due to societal and workplace changes (e.g., individualization, increased emphasis on performance, and new positions and challenges for women).

The overall aim of this thesis was to examine contemporary aspects of health and performance among young adult women and men. The term “contemporary” is used to emphasize that the impact of the examined aspects might have increased, and be increasing even more, due to recent major cultural and structural changes, such as: a) an increasing number of women studying at university, b) an increasing number of women entering educational fields and occupations traditionally dominated by men, and c) an increasing emphasis on individual performance and the pursuit of self-esteem. Based on these considerations, my intention was: 1) to explore early inequalities in health and performance between young women and men in higher education, 2) to explore conditions related to stress and insufficient recovery among highly educated women in non-traditional women’s occupations, and 3) to examine performance-based self-esteem (PBSE) as a predictor of frequent sickness presenteeism among young adult women and men.

Background

Overview of the thesis

This section provides comprehensive background to the empirical studies included in the thesis. This overview starts by conceptualizing young adulthood and describing the transitional process of entering adult life; the health of young adults and health inequalities between young women and young men are then described. The next section describes the characteristics of major societal changes, how they have affected the lives of young adults, and how they might have brought new potential health hazards. After describing gender in health research, the theoretical frameworks of health, stress, performance, and sickness presenteeism are considered. At the end of each section, I briefly describe how a specific theme has been handled in this thesis. Extensive sections containing several subsections end with an overarching summation of the entire section.

Young adults

The concept of young adulthood

Young adulthood is a rather broadly delimited concept. The developmental psychologist E.H. Eriksson suggested that this period lasts from 20 to 40 years of age [1]. This is reasonably in line with recent health research that, under the term young adults, includes individuals from 16 [2] to 44 [3] years of age. The heterogeneity of this group is obvious, even in the context of western high-income nations. It may include both individuals at the end of their teen years, still living with their parents, and individuals with almost grown-up children and a long occupational career behind them. In addition, this heterogeneity is increased by social gradients, ethnicity, and gender. Besides age, young adulthood is often defined by specific activities, such as moving away from home, commencing higher education, getting a job, and starting a family.

In recent decades, the transition to adulthood has changed substantially, resulting in a de-standardization in which this period has not only been prolonged but also become more fragmented, diversified, and less linear. Young adults today are likened to yo-yos, as they oscillate between education, employment, and non-employment. Arnett (2000) has even proposed that this in-between period between adolescence and adulthood forms a new and distinct period in life development, i.e., “emerging adulthood”, characterized by change and exploration [4]. Walther and Plug (2006) have concluded that this de-standardization “has replaced security and predictability by personal choices and risks” [5]. Correspondingly, two meta-analyses observed substantial increases in anxiety and neuroticism from 1952 to 1993 [6]. The American psychologist Jean Twenge even calls this new situation “the age of anxiety”, and refers to young people today as constituting “Generation Me”. She identifies a paradox where young people today

[have] so much more than previous generations – we are healthier, enjoy countless modern conveniences, and are better educated. But Generation Me often lacks other basic human requirements: stable close relationships, a sense of community, a feeling of safety, a simple path to adulthood and the workplace (p. 136) [7].

In sum, young adulthood is inconsistently defined, and studies in health research describe it as including ages between 16 and 44 years. Consequently, together with socio-economic, ethnic, and gender factors, this wide age range results in a great diversity of life situations among young adults today, even just in western high-income nations. To distinguish adolescence from later periods in adult life, the study samples in this thesis include individuals aged 19–29 years.

Health among young adults

According to Patel et al. (2007), addressing young people’s mental health needs is “crucial if they [i.e., young people] are to fulfil their potential and contribute fully to the development of their communities” [8]. Despite this, the health status of young adults has received little attention compared with that of adolescence [9]. Because of the imprecise definition and heterogeneity of the young adulthood period (see above), it is complicated to define an all-embracing pattern or trend of health in this “group”. On top of this, the overall picture might also depend on whether one is looking at self-reported symptoms, the prevalence of specific diagnoses, or certain health-related behaviours. Nevertheless, the mental health of young people was recently described as a global public health challenge accounting for much of the disease burden of young people in all societies [8].

Although most young people in Sweden regard their health as “good” [10], a recent Swedish government review (2006) concluded that in the last two decades stress-related symptoms and mental health problems have increased drastically among young people in Sweden. In line with this, the reviewed studies identified an increase in worries, anxiety, sleeping disorders, fatigue, tension, and pain [11]. According to Statistics Sweden, reports of worries and anxiety have increased three fold among women and two fold among men, while sleeping disorders have increased three fold among both women and men aged 16–24 years (see Figure 1); similar developments are also evident among young adults aged 25–34 years [10]. It has been proposed that this increase might be due to changed attitudes towards mental health among young people. However, a longitudinal study in the County of Stockholm found no support for this assumption [12], and the increase in self-reported symptoms also parallels observed higher rates of in-patient care for depression and states of anxiety [11].

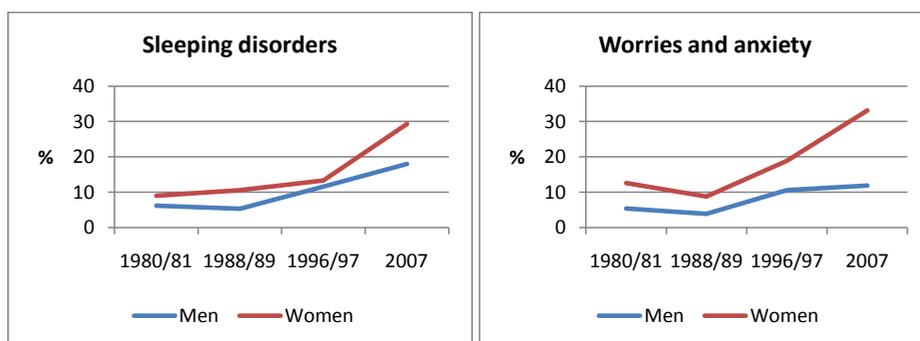


Figure 1. Development of reported sleeping disorders as well as worries and anxiety among young women and men (aged 16–24 years) from 1980/81 to 2007.

Because of the described increase of the above problems in combination with a high prevalence of symptoms of several other mental health problems among young adults (see Table 1) [13], the Swedish National Board of Health and Welfare has emphasized mental health in young people as a field demanding much attention in years to come [14].

Table 1. Prevalence (%) of symptoms, social situation, and health-related behaviours among Swedish young adult men and women aged 20–24 years (data from the Swedish National Institute of Public Health, 2006–2008)

<i>Symptoms</i>	Men (%)	Women (%)
Headache	17	39
Worries and anxiety	28	47
Sleeping disorders	20	28
Stress	11	25
Decreased mental well-being	18	30
Problems of fatigue	39	57
<i>Social situation</i>		
Lacking emotional support	17	8
Exposed to offensive treatment	25	40
Abstained from going out alone	7	45
<i>Health-related behaviour</i>		
Hazardous alcohol usage	64	49
Hazardous gambling habits	9	2
Physical activity >60 minutes/day	76	68

International comparison of the prevalence of mental disorders is complicated due to the variance in assessments, lack of cross-national studies, and the wide range of symptoms included in the term mental disorders [15]. Even so, in a recent transdisciplinary synthesis, Eckersley (2010) concluded that there is an apparent and international trend towards poorer mental health among young people in western nations. He states that “the societal changes of the last half century have harmed successive generations of young people because of their developmental vulnerability and that these young people have carried their enhanced risk into later life” [16].

In line with a social gradient of health, the unemployed and individuals at lower socio-economic levels generally have worse health [13, 17, 18]. However, in Sweden, especially among young women, the increase and prevalence of worries and anxiety diverge slightly from this social gradient of health, as young studying women have experienced the largest increase of worries and anxiety. The prevalence of reported worries and anxiety in this group is even higher than among unemployed women [19]. In line with other studies [20–22], this indicates that health among highly educated young women is an increasingly important problem, especially given the increased proportion of women with at least three years of university studies. In 1988–1989, 9.5% of women and 11.6% of men aged 25–34 years had at least three years of university studies; the same figures for 2007 were 39.9% of women and 25.7% of men [10]. Previous studies have also observed that university students often report higher psychological distress than the general population [23, 24].

Moreover, as noted in Table 1, the prevalence of most mental health symptoms is higher among young women than among men of the same age [10, 11, 13, 15, 25]. Despite this, lack of

emotional support, hazardous alcohol usage, and hazardous gambling habits are more pronounced among young men [13].

In sum, there are indications that a number of mental health symptoms have increased among young adults. It has previously been suggested that the high prevalence of subjective health complaints should be taken into consideration whenever such complaints are reported in connection with any new environmental factor (see the following section, “Societal changes pose new potential health hazards?”) [26]. Moreover, even at a young age, women experience a higher prevalence of self-reported symptoms such as stress, worry and anxiety, and sleeping problems than do young men. Finally, considering worries and anxiety, the largest increase and highest prevalence have been found among young studying women. The focus of the present thesis is on these, often stress-related, mental health symptoms.

Societal changes pose new potential health hazards?

Western societies have undergone major structural and cultural changes in recent decades, changes thought to bring with them new potential health hazards, partly overlooked in current epidemiology [27]. It has also been suggested that these societal changes have brought about an increasing focus on individualism and self-fulfilment, a heightened sense of uncertainty, and a rise in personal expectations in modern western societies [28-30]. The German sociologist Ulrich Beck has even stated “the ethic of individual self-fulfilment and achievement is the most powerful current in modern society” (p. 9) [31]. Although individualization can historically be seen as a progressive force working against dogma and discrimination [27], it is also less easily managed and more anxiety provoking [32]. At the same time as people’s life paths have become more uncertain, people are increasingly being held accountable for their own fates [27, 28]. Schwartz reasons about individualized societies, positing that “not only do people expect perfection in all things, but they expect to produce this perfection themselves” [33]. Still, people seem to be dependent on conditions outside their own control [34].

Although not encompassing all occupational fields, there has been a shift towards a greater focus on individual flexibility in the sense that work has become more unpredictable [35] and “the expectations placed on the worker to define, structure, and discipline her own performance are increasing” [36]. Even the responsibility for work-related health seems to have shifted from the employer to the individual employee, i.e., employees must set their own limits in relation to work [37]. Correspondingly, in a recent study of laypeople’s representations of occupational stress, though participants recognized the role of organizations in creating stress, they saw it as their *own* responsibility to deal with this stress [38]. Like the effects of individualization, overall, increased occupational flexibility seems to work in divergent ways. Although occupational flexibility can contribute to work satisfaction by bolstering individual autonomy, freedom of choice [39], and more flexible arrangements for managing family life [40], it has also been observed to reduce individual control of working time and performance [37].

Finally, it has also been proposed that these societal changes are particularly evident in the lives of women who, to a greater extent than men, confront challenges not faced by earlier generations [28] and are expected to assume considerably changed and expanded roles [41]. For example, traditional care-taking roles have been supplemented by roles more focused on self-development [28] and, instead of simply abandoning traditional gender positions, women now

combine them with more self-enhancing roles [28, 42]. Steward and Healy (1989) state that as “broad values and expectations about the world form during childhood”, different generations are exposed to radically different gender role norms [43].

Young adults in a changing society

Young adults might be especially vulnerable to the societal changes described above. On top of that the transition to adulthood is known to be a period when role conflicts and ambiguities can be highly stressful and difficult to manage [29], there has been a de-standardization where this period has not only been prolonged but also more fragmented, more diversified, and less linear [44]. According to Furlong and Cartmel (2007), most of these changes are direct results of labour market restructuring, increased demand for highly educated workers, and flexible employment practices. Consequently, young people have to negotiate a set of risks largely unknown to their parents. Moreover, as many of these changes have come about in a relatively short period, processes of social reproduction that ordinarily serve to smooth these transitions have become vague and clear references are often lacking. This situation has itself resulted in increased uncertainty, which in turn serves as a source of stress and vulnerability [45]. Furthermore, although personality traits are considered fairly stable, there are indications that the described societal changes have even altered personality characteristics of recent generations. A large comparative study of young adults in the USA between 1960 and 2002 found increases in individualism (i.e., “doing your own thing”), cynicism, and self-serving attitudes [46], while another cross-temporal study found a considerable generational increase in narcissism among college students [47]. In a recent comparison between two British birth cohorts, the later cohort was found to display increased individualization during the phase of entry into adulthood [48].

In line with this new societal environment, it has been suggested that individuals’ expectations of life have increased considerably, particularly among young women [32]. However, parallel to these increased expectations, there seem to be an increasing gap between individual expectations and the capacity to realize those expectations [32, 49]. Hence, at the same time as individual accountability and achievements are constantly being reinforced in society, young people often remain powerless. According to Furlong and Cartmel (1997), this situation can often lead to doubt and constant reinterpretation of one’s identity [29]. A corresponding indication could be that young people also manifest a higher prevalence of performance-based self-esteem (see below) [50]. An increased focus on individual achievements was also recently observed as a main factor contributing to the rise of mental health problems among young people in Sweden [11].

In sum, as health is strongly related to the constant interplay between the individual and the environment, major societal changes may be creating new potential health hazards. Although there is scientific support for the reality of such changes, knowledge of how they might contribute to new potential health hazards is still mostly theoretical. Hence, the present thesis examines three circumstances that have increased in recent decades: a) an increasing number of women studying at university [10], b) an increasing number of women entering educational fields and occupations traditionally dominated by men [10], and c) an increased emphasis on individual performance [11, 28] and the pursuit of self-esteem [50, 51].

Gender in health research

In medicine, the terms *sex* and *gender* are often used interchangeably although they have fundamentally different meanings [52, 53]. Sex has been defined as “the classification of living things, generally as male or female, according to their reproductive organs and functions assigned by the chromosomal complement” (p. 1) [54]. In this context, sex refers to biologically given differences between women and men. To distinguish more social and cultural constructions of femininity and masculinity from sex, the concept of gender was introduced in the mid 1970s [55]. Although there is no generally recognized definition of gender, it can refer to how “men and women are interpreted in different cultures, and how masculinities and femininities are shaped continuously and differently across time and space” [56]. In this way, gender is viewed as a dynamic social structure [57] and is something that one *does*, recurrently and in interaction with others [58]; it also comprises how men and women are viewed in society, what they look like, and how they perceive the world they live in [59]. To understand the relationship between gender and health, it is also important to recognize that gender is negotiated partly through relationships of power [57, 60], often in an interaction with class and ethnicity [60]. According to Hirdman (1988), the “gender system” organizes men and women mainly according to two principles. First, almost all categories in life are distinctly separated into male and female. Second, there is a hierarchical system in which men are considered the standard of what is normal and valid. This system reproduces itself at an abstract level of cultural images, at an institutional level, and at an interpersonal level [61].

For a long period of time there has been an undisputed paradox in medical sociology that women have higher rates of morbidity whereas men die earlier. As early as 1927, Fairfield (cited in Nathanson, 1977) captured this issue by concluding that “women are sick and men die” [62], which later became the familiar slogan “women get sicker, but men die quicker” [63]. Although life expectancy is lower among men in almost all countries in the world [64], the assumed higher prevalence of general morbidity among women has recently been observed to be more complex [57, 65]. Instead, the direction and magnitude of differences in morbidity seem to vary according to the symptom and to the life cycle phase [65, 66]. In line with this, Arber and Cooper (1999) suggest that one should study specific age groups, rather than assume that the relationships remain constant throughout the life course [67]. According to Macintyre et al. (1996), female excess morbidity is only consistently found across the life span for psychological manifestations of distress [65]. Men, on the other hand, seem more likely than women to suffer from fatal chronic conditions, a higher prevalence of heart disease at younger ages, and higher injury rates at all ages [68].

Although biology might contribute to the observed mental health inequalities, the impact of socio-culturally-based factors (e.g., gender) seems strong. Three reviews have concluded that gender positions and gender-related psychosocial factors are more important than biological differences in accounting for the inequalities between women and men in both stress responses [69] and unipolar depression [25, 70]. However, and in contrast to these results, most research in this field seeks explanations exclusively within the biomedical model of health [71]. Nevertheless, because of constant interplay between biology and the environment [72], it is impossible to determine the degree to which a phenomenon is exclusively social or biological [73]. Hence, health research should focus concurrently on both biology and gender [56], and

neither social nor biological perspectives alone are sufficient to account for observed differences in symptoms [74]. In this way, gender does not set aside the importance of biology, but provides a wider, complementary, and more informative frame of interpretation.

Several empirical studies of health differences between men and women have applied the *differential exposure hypothesis* [66, 67, 75] and/or the *differential vulnerability hypothesis* [76, 77]. The differential exposure hypothesis assumes that observed health inequalities result from gendered structures in society, i.e., women inhabit different positions than do men, which in turn results in women and men facing different exposures [67, 75, 78-82]. This differentiation of exposures is mainly because of: a) an observed higher total work load among women (i.e., paid plus unpaid work) [83-85] and b) a widely segregated labour market [86, 87]. This segregation can be divided into horizontal and vertical dimensions. *Horizontal segregation* refers to both paid and unpaid work and captures how occupations, tasks, and positions are generally divided in women's and men's work [80]. *Vertical segregation* refers to the fact that more men than women are found in higher managerial positions [87, 88]. The differential vulnerability hypothesis suggests that, even though exposures are identical, individuals differ in susceptibility [77, 89]. Greater susceptibility might be due to several reasons, such as different coping methods [90, 91], cognitive variables [92], health-related behaviours [93], and social position or status [94]. According to Siegrist and Marmot (2004), the relationship between social status and health is based on the fact that exposure to an adverse psychosocial environment may elicit sustained stress reactions with negative long-term consequences for health [95].

Beyond hypotheses emphasizing differential exposures and vulnerability, higher rates of health problems and healthcare usage among women are sometimes explained by differences "in the way the symptoms are perceived, evaluated and acted upon" [96]. According to these hypotheses, the described differences occur for several reasons. a) Childhood socialization and adult role expectations and obligations (e.g., men being socialized to be more stoic [97, 98], whereas women are taught that it is acceptable to seek help) might result in gender-based attention to the body or differences in symptom reporting [99, 100]. Gender-based socialization might also result in women having a greater tendency to attribute somatic sensations to physical illness [99]. b) Women might also have greater opportunities to pay attention to symptoms due to lack of external information; for example, "one can argue that the traditional social situation for women, buried in an isolated suburb, her husband at work and children gone off to school, will increase symptom reporting considerably" [99]. c) Because of menstruation, childbirth, menopause, etc., women might also have more somatic information and as a result have learned to attend more closely to bodily cues and changes [99, 100]. d) Due to differences in personality, for example, more women than men might have negative affectivity, though empirical support for this is inconclusive [99]. In conclusion, although there is some support for hypotheses that women's higher prevalence of ill-health is due to differences in how symptoms are perceived, evaluated, and acted upon [101], there seems to be little direct supporting evidence [100] and several studies provide inconclusive and even contrasting evidence [100, 102-106].

In sum, although the structural differentiation between women and men persists, Arber (1997) notes that women's labour market position and family role have changed considerably since the 1970s. Consequently, approaches to measuring inequalities in women's health must reflect changes in women's employment participation, marital status, and living arrangements [107]. Likewise, McDonough and Walter (2001) state that, although women have increasingly entered

the labour force in recent decades, “we understand very little of this profound social change on population health”, particularly as these new conditions both give access to material rewards and expose women to a wide variety of health risks [77]. Although gender analysis provides important insight into the health of both women and men, research into men’s health in relation to gender has been neglected [57, 108, 109]. Unfortunately, the present thesis will provide yet another example of such neglect.

In this thesis research, gender in relation to health and performance is mainly explored in **studies I–III**. It has previously been suggested that it is desirable to compare men and women in very similar situations [110] to reduce apparent differences in work-related health conditions between women and men [78]. In line with this and with the design of a previous study [78], **studies I and II** examined differences in health in a fairly homogenous sample of students having the same age, the same task, the same formal hierarchal level, and similar familial status (i.e., very few had children). **Study II** also examined whether the determinants of maintained health and performance display similar associations in young men and in young women. Previous studies have indicated that the minority situation of women in male-dominated workplaces might have negative consequences for these women’s health [80, 111-113]. As an increasing number of women are today entering education fields and occupations traditionally dominated by men [10], only women facing these environments were included in **studies II, III, and I**. **Study III** was also based on a recent call for qualitative studies of young women’s experiences of daily life to better understand stressors and coping resources in this group [114]. Although gender was not a main factor considered in **study IV**, relationships of potential significance are discussed (i.e., the prevalence of performance-based self-esteem and a potential difference in exposures).

Health

The concept of health

Although “health” is a term frequently used by laypeople, healthcare professionals, and politicians, the exact nature of this concept is the subject of ongoing debate. Nevertheless, Nordenfelt (2007) emphasizes that whether health is understood “as people’s happiness, or their fitness and ability to work, or instead just the absence of obvious pathology in their bodies” has considerable practical and ethical consequences [115].

In the 1948 constitution of the World Health Organization (WHO), health is defined as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” [116]. However, both medicine and psychology have been criticized for being too focused on pathology, in both research and healthcare practice [117-120]. Such criticism of the so-called biomedical model of health has mainly touched on two issues. First, recent empirical studies have emphasized the relevance of a positive dimension (e.g., subjective well-being and life satisfaction) that complements the element of pathology in relation to health [118, 119, 121, 122]. This research has even indicated that well-being and “ill-being” might predict distinct biological correlates [123]. However, there is still no standard for measuring the presence of positive health [119]. The second main criticism is that biology alone provides an insufficient basis for understanding, treating, and preventing disease. As early as 1977, Engel argued that the reductionist and dualistic (i.e., mind–body) approach of this model was inadequate and that a new model was needed to broaden the approach to disease to include psychosocial factors as well.

Although recognizing the large contributions the biomedical model had made to the general understanding and treatment of disease, he introduced the biopsychosocial model to promote better understanding of the determinants of disease [120]. In a recent development of this model, the concepts have been rearranged, i.e., socio–psycho–physiological, to better express the assumed hierarchical relationship between social structure, psychological states and processes, and physiological reactions [124] (see the detailed discussion below).

Debate about the nature of health has also considered whether health and disease are matters of objective measures alone, or whether they also include subjective evaluation of the individual subject. Nordenfelt (2007) outlines a holistic definition of health emphasizing the individual's subjective experience of problems (i.e., illness) that affect individual ability to achieve vital goals, problems that precede formal disease. Here health is also compatible with the presence of disease [115], whereas in the biostatistical model health is identical to the *absence* of disease [125].

In sum, the exact nature of health is the subject of ongoing debate, and medical philosophy, health research, and healthcare practice have different emphases in this debate. Because most young adults are actually of good health status [10], this thesis research did not consider disease per se. Instead, the constituent studies focus on conditions or behaviours that might result in health problems later in adult life, namely: a) inequalities in very good self-rated health with no performance impairment (**studies I and II**), b) conditions related to stress and recovery, because sustained high levels of arousal might result in disease (**study III**), and c) frequent sickness presenteeism as a behaviour related to subsequent health problems (**study IV**).

Mental health

In Geneva in 2001, the WHO recognized mental health as a major international public health concern (WHO), and it has been predicted that depression will be the second leading cause of global disability burden by 2020 [126]. Even so, the burden of mental health problems might have been underestimated because of inadequate appreciation of the connectedness of mental health problems and other health conditions [127]. Mental health is integral to the WHO definition of health: “a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses in life, can work productively and fruitfully, and is able to make a contribution to his or her community” [128]. Mental health problems are defined in a wide range of ways, encompassing a range of severity from serious mental disturbance to milder states of worry, anxiety, and lack of psychological well-being. More severe mental health problems are defined in the international diagnostic manuals ICD-10 (International Classification of Diseases) and DSM (Diagnostic and Statistical Manual of Mental Disorders). However, many common health problems such as pain, depression, and fatigue are highly prevalent in the population although they do not meet diagnostic criteria [129]. Consequently, the DSM captures only the tip of the iceberg of subjective health complaints [26] and, when the Swedish National Board of Health and Welfare estimated that 20–40% of the population suffered from mental health problems, they included a wide range of problems from more serious disease, such as psychotic psychiatric disorders, to less severe problems, such as worry, anxiety, and sleeping disorders [130]. At a national level, these less severe problems, because of their prevalence, might constitute the bulk of mental health problems and dysfunction, and are often characterized as “common mental disorders” [131]. When speaking of mental health problems as a mounting

public health issue among young adults in Sweden, it is not mainly formal psychiatric diagnoses that are at issue, but rather mental health problems related to life crises, work, or life stress [11].

In sum, mental health includes a wide range of dimensions from diagnosed psychiatric disease to common mental disorders. Moreover, it is not completely clear whether “mental” describes the symptoms of an illness or its underlying pathology [132]. In view of the large increase in self-reported mental health complaints among young adults (see above), this thesis will focus on such complaints and not on more severe diagnoses.

Laypeople's understanding of health

Beyond ongoing professional debate as to the true nature of health, lay definitions of health have been emphasized. These definitions are important in part because they determine whether or not people consider themselves ill and whether they then consult a physician [133]. According to Blaxter (1990), there is widespread agreement among health researchers that health is multidimensional and is perceived by laypeople as freedom from illness, functional capacity, and fitness. Alongside these interpretations, health is frequently seen as a kind of reserve, which can be weakened by self-neglect or bolstered by healthy behaviour. Blaxter also demonstrated that, for health in oneself, psychosocial aspects were stressed at all ages. “Health is a state of mind” and “health is a mental more than a physical thing” were common statements [134]. As the lay understanding of health is closely related to self-rated health, these concepts are treated simultaneously in the next section.

Self-rated health

Self-rated general health is a well-used measure and a robust predictor of both mortality [135-141] and future morbidity [139, 142]. Although self-rated health has characteristically been viewed as the sum of a person’s medical health status and functionality [143], medical history, cardiovascular risk factors, and educational attainment only partly explain the association between self-rated health and mortality [136]. Correspondingly, other studies have found that self-rated health can also represent functional aspects [139, 143-147] and health-related behaviour [145], and it has been found that younger individuals seem to use a broader range of criteria than do older individuals [148]. There have also been studies indicating that women and men might consider different factors when assessing self-rated health [149]; however, the evidence is conflicting and Manor et al. (2001) conclude that women and men consider the same factors when report their health status [142].

Furthermore, most prior studies have focused on the predictors and outcomes of negative self-rated health, assuming that factors associated with positive and negative self-rated health are the same. However, a recent study concluded that at least some of the factors associated with negative self-rated health differ from the ones associated with positive self-rated health [148].

In sum, lay views of health are important in reaching an understanding of health-seeking behaviour and when using health self-evaluations in research and in healthcare practice. Self-rated health is said to be “especially useful for participants in early adulthood for whom clinical endpoints are uncommon” [150]. In this thesis research, self-rated health was assessed when exploring inequalities between young women and men in **studies I** and **II**. Taking laypeople’s understanding of health into consideration was also important in **study IV**, when examining the issue of sickness presenteeism.

Theoretical framework for the determinants of health

According to Rugulies et al. (2005), risk factor epidemiology and its reductionist approach has been under increasing criticism due to the failure of behaviour modification programs and failure to develop knowledge of various widespread chronic health conditions [124]. Consequently, based on the work of scholars such as Aaron Antonovsky, George Engels, George Kaplan, and Michael Marmot, Rugulies et al. (2005) present a socio–psycho–physiological framework for health and illness. Briefly stated, this model illustrates how the synergy of social structures, psychosocial processes, and biology are linked to population and individual health and illness by four pathways: a) a direct connection between living conditions and health and illness, b) living conditions contribute to health and illness through psychological and physiological processes (i.e., stress response), but also because psychological processes are linked to health-related behaviour, c) living conditions are connected to health and illness through health-related behaviour, and d) both genetic and personality factors directly and in interplay with environmental factors affect health and illness. The original model has here been modified by adding yet another pathway whereby individuality factors are connected to health and illness through health-related behaviours (see Figure 2).

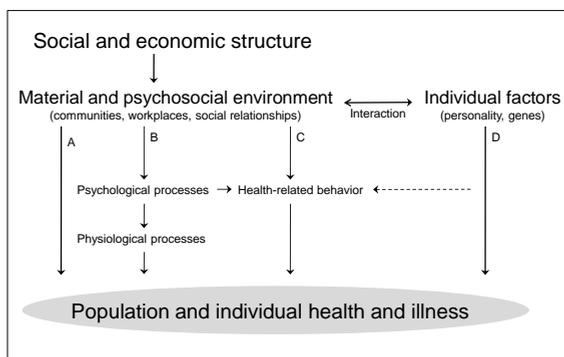


Figure 2. A modified version of the hierarchical socio–psycho–physiological framework of health and illness [124]. The broken line from individual factors to health-related behaviour has been added to the original.

In sum, in accordance with the socio–psycho–physiological framework of health and illness, this thesis research assumes that societal change could result in new potential health hazards, considering some of the above pathways. For example, the entry of an increasing number of young women into higher education and into occupational fields traditionally dominated by men could affect their material and psychosocial environment, which could in turn affect their health (**studies I–III**), either directly or indirectly through behavioural, psychological, and physiological processes (pathways A, B, and C). In **study IV**, a potential pathway involving personality aspects concretized via health-related behaviour (i.e., sickness presenteeism) is examined.

Life-course perspective on health

A life-course perspective on health postulates pathways that link exposure throughout the life course to later health and disease [151]. In this tradition, epidemiology considers how socially patterned exposures during childhood, adolescence, and young adulthood relate to adult health.

Or, in the words of Krieger, “health status at any given age reflects not only contemporary conditions but prior living conditions, in utero onwards” [152]. Most studies in this field can be divided into the a) critical period model, b) the pathway model, and c) the accumulation model. The *critical period* model views exposure during particularly sensitive periods of development as having life-long impact on health, independently of adult circumstances [153], while the *pathway model* assumes that early life circumstances have an indirect impact on later health, as these circumstances also affect later health-related trajectories of adult life [154]. The *accumulation model* proposes that life-course exposure gradually accumulates through episodes of health problems, adverse environmental conditions, and health-damaging behaviours [155]. In accordance with these perspectives, McGorry et al. (2007) emphasize the extraordinary role of younger years for future health:

Given the exquisite developmental sensitivity of this phase of life, where psychological, social and vocational pathways and independence are being laid down, it is not surprising that mental disorders, even relatively brief and milder ones, can derail and disable, seriously limiting or blocking potential [156].

In sum, although this thesis research does not specifically take account of life-course epidemiological studies, its general theoretical foundation is based on a life-course perspective on health; that is, environmental conditions and health behaviour in young adulthood affect the maintenance of health later in adult life. Hence, early inequalities between women and men in health and performance (**studies I and II**), conditions related to stress and insufficient recovery (**study III**), and performance-based self-esteem as a predictor of frequent sickness presenteeism (**study IV**), might affect subsequent health.

Performance

Performance is a concept with several connotations. It is included in this thesis on the following three grounds. First, although performance and individual function represent different concepts, they are closely related. The question (i.e. very good health and no performance impairment) used in **studies I and II** emphasizes the aspect of individual functioning, which in turn can be seen as an important aspect of health (e.g., impaired individual functioning reduces the likelihood of achieving one’s vital goals [115]). Moreover, health-related individual functioning is also an important aspect of the maintenance of work ability (see below) [157]. Second, societal change may have led to increased emphasis of individual performance and achievement [11, 31, 33, 50]. Therefore, **study IV** takes performance to represent an internal driving force, i.e., performance-based self-esteem [11, 31, 50]. According to the results of **study III**, performance also exemplifies an external social stressor, i.e., performance-focused surroundings. Third, as the individualization of society increasingly emphasizes individuals’ own responsibility for their health [37, 158], individuals themselves might have to set boundaries to allow for sufficient recovery when needed. Therefore, **study IV** takes sickness presenteeism to represent a potentially hazardous behaviour or over-performance behaviour in which such boundaries are not set [159-162]. This behaviour was also found among participants in **study III**.

The concept of work ability

The concept of work ability was developed in Finland in the early 1980s as a step towards increasing the work participation of the elderly population [163, 164]. According to Ilmarinen, work ability is based on a balance model, in which “the human resources correspond to the work demands in a healthy and safety way” [157]. According to this conceptualization, a person’s resources consist of health and capacity as well as education, competence (skills), values, and attitudes. In turn, work demands include not only the actual content of work but also work environment, community, and organization [165]. However, the definition of work ability also seems to depend on whether it is considered from the viewpoint of occupational health, social insurance, or rehabilitation [166]; although work ability is important to individuals, societies, and organizations, existing definitions of the concept are still inadequate and fragmented, and shared evaluation instruments are still lacking. The literature on work ability mainly covers three interrelated dimensions, i.e., a physical, a mental, and a social dimension [167]. Besides objective measurements that emphasize functional capacity but downplay work environment and work demands [168], the best-known questionnaire is the Work Ability Questionnaire (WAI) developed in Finland by Tuomi et al. in the 1980s [169].

Ilmarinen recently stated that the predictors of work ability could be generation-related; accordingly, young adults need special attention to secure their work ability, because they comprise the minority of the workforce and, as newcomers, face high employer expectations [166].

In sum, this thesis research does not include any sophisticated assessments of work ability. Instead, work ability is seen from a life-course perspective according to which the examined conditions might affect future work ability and premature retirement. In **studies I** and **II**, very good health and *no performance impairment* could be interpreted as one component of individual capacity and resources. Work ability is also touched on in **study III**, as it illustrates the interplay between individual resources and environmental conditions. Finally, the outcome used in **study IV** (i.e. sickness presenteeism) has in recent studies predicted later long-term sick leave, previously used as a proxy for decreased work ability (see below).

Performance-based self-esteem as a vulnerability trait in modern societies

It has been suggested that the ethic of individualization, which emphasizes individuality and performance, promotes the individual pursuit of self-esteem [50, 51]. This pursuit is based on the conclusion that one’s individual worth is not a given but “must be demonstrated, proven, or earned” [51]. As well as possibly fostering an increase in individual pursuit of self-esteem, the new societal context might also provide environmental conditions to which individuals involved in this pursuit might be especially vulnerable. For example, as noted above, responsibility for work-related health has been shifted from the employer to individual employees, who must set their own limits in relation to work [37]. However, setting these limits (e.g., taking sick leave when needed) could be especially difficult for individuals whose self-esteem is contingent on their individual performance [50, 51]. Furthermore, this difficulty might be particularly pronounced in work situations involving more uncertain work outcomes and a shift towards a more individualized and competitive working life [50]. The health mechanism underlying this reasoning is in line with the theoretical framework of allostatic load (see below). That is, when individuals do not obtain sufficient recovery, the social environment has a cumulative impact on

their physical and mental health [170]. Hence, the short-term emotional benefits of pursuing self-esteem are often outweighed by long-term costs [51]. Theoretically, this proposed mechanism makes performance-based self-esteem a potential and relevant predictor of sickness presenteeism.

Performance-based self-esteem (PBSE) [50] is conceptualized as a type of contingent self-esteem [51, 171] emphasizing the level to which individual self-esteem depends on individual performance. The concept builds on previous research into contingent self-esteem emphasizing either an overall contingent self-esteem based on the level of stability of one's self-esteem [171] or the fact that one's self-esteem is contingent in specific domains of life [51]. The PBSE scale has previously displayed positive associations with burnout [172, 173] and, in a validation study, even with sickness presenteeism, neglect of personal needs, and problems saying "no" to wishes and requests from others (i.e., individual boundarylessness). The psychometric properties of the PBSE scale have shown themselves to be satisfactory [50], and its specific item formulation means that the risk of outcome overlap is small.

In sum, it is suggested that because of societal change the pursuit for self-esteem has increased (i.e. one's worth is not given but have to be demonstrated, proven, or earned). This behavior might result in a potential hazardous striving behavior where the short-term emotional benefits of pursuing self-esteem are often outweighed by long-term costs. This might be particularly awkward in a situation where health is increasingly seen as the responsibility of the individual alone. Theoretically, this makes performance-based self-esteem a potential and relevant predictor of sickness presenteeism (**study IV**).

Sickness presenteeism as a predictor of future health and work ability

Recent studies have observed that sickness presenteeism, i.e., going to work despite being ill enough to take sick leave, might counteract the maintenance of health and work ability [159-162, 174]. Even though it has been suggested that sickness presenteeism both pre-dates and is more fundamental than sickness absenteeism [175], research has largely overlooked sickness presenteeism compared with absenteeism [175, 176]. That both phenomena are in fact outcomes of the same decision process [177, 178] was partly illustrated in a recent study demonstrating that, when organizations downsize, sickness absence is often replaced by sickness presenteeism [179]. This also corresponds to the results of Hansen and Andersen (2008), who state that "some groups have artificially low levels of sickness absence that do not reflect their levels of morbidity" [175]. Consequently, Ahola et al. (2008) identify the risk of too one-sided a focus on sickness absenteeism: "in addition to individual interventions, procedures to reduce absences should focus on improving conditions that are prerequisites for burnout, rather than on reducing absences by policies encouraging working while unwell" [180]. Previously, a few cross-sectional studies have supported a suggested association between sickness presenteeism and health problems [175, 179, 181, 182], but until recently, only Kivimäki et al. [162] had provided longitudinal support for this notion. When working while ill predicted subsequent adverse cardiac events in the Whitehall II cohort [162], Kivimäki et al. proposed three possible explanations. First, consistent with the allostatic load hypothesis (see below), working when ill might produce a cumulative psychological burden with pathophysiological consequences. Second, working when ill might induce acute stressors that act on pre-existing or subclinical vascular disease (i.e., the triggering hypothesis). However, a recent study did not find support for this hypothesis [183]. Third, sickness presenteeism may be part of a lifestyle in which symptoms of health problems are

ignored and medical care is not sought [162]. Recently, four longitudinal studies have replicated the relationship between sickness presenteeism and health [159-161, 174]. Similarly, two of these studies demonstrated that repeatedly going to work when ill (i.e., >5 times a year) was associated with later long-term sick leave [159, 161]. Sickness presenteeism has recently also been observed to predict future general health [160] as well as degraded performance and burnout [174]. Accordingly, as well as illuminating the potential health risks of working when ill, research into sickness presenteeism might also enhance our understanding of sickness absenteeism [178].

In sum, recent studies indicate that a behavior of going to work when ill (i.e. sickness presenteeism) is associated with future health problems and decreased work ability. In line with a life-course perspective on health, such behaviour among young people might obstruct the maintenance of health and work ability later in adult life. Repeatedly going to work when ill (>5 times/year) was used as the outcome in **study IV** but was also observed among the participants in **study III**.

Determinants of sickness presenteeism

Work attendance has been conceptualized as resulting from individual choice. The following sickness presenteeism model was developed with reference to the tradition of occupational health psychology and illustrates how individual factors such as *personal demands for presence* (e.g., individual boundarylessness and private financial demands) and organizational *work-related demands for presence* (e.g., replaceability, sufficient resources, and time pressure) may influence an employee’s choice of whether or not to go to work when ill. Aronsson and Gustafsson (2005) even propose the importance of days of work absence to promote recuperation from illness with acute phases [177] (see Figure 3).

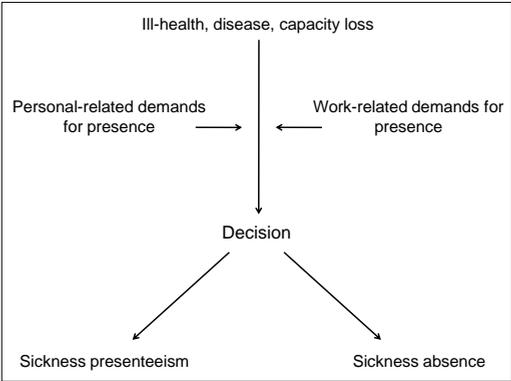


Figure 3. Simplified version of the sickness presenteeism model: a model of how personal and work-related demands for presence guide employee decisions as to whether or not to go to work when ill [177].

A similar line of reasoning was earlier used by Kristensen (1991), who noted that work absence can also be regarded as a coping behaviour for the individual [178]. The *illness flexibility model* was developed from psychological models of decision-making and, like the sickness presenteeism model, it focuses on the factors that influence and mediate an employee’s choice of whether or not to go to work when ill. The opportunities that employees have to reduce or otherwise alter their

work effort when they feel ill are described as *knowledge/skills* and *adjustment latitude*. Possessing more knowledge/skills lets an employee use less effort when performing a certain task, while adjustment latitude describes opportunities to adjust work to health. Moreover, through motivation, the choice of whether or not to go to work when ill is a result of: a) attendance requirements (i.e., negative consequences of not attending work), b) absence requirements (i.e., negative consequences of attending work), c) attendance incentives (i.e., conditions that make employees want to attend work despite being ill), and d) absence incentives (i.e., conditions that make employees more inclined to be absent when ill) [184] (see Figure 4).

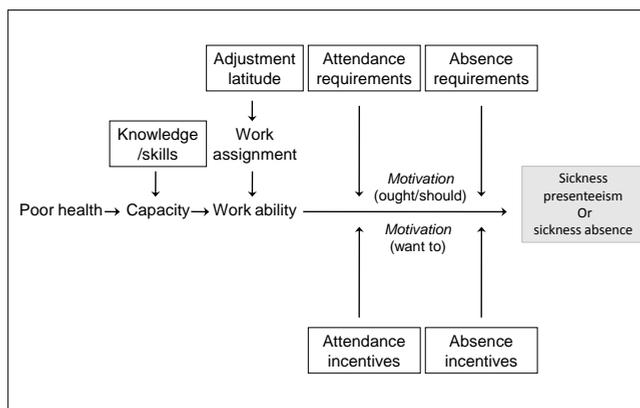


Figure 4. Based on the illness flexibility model. Note how an employee’s decision as to whether or not to go to work when ill depends on knowledge/skills, adjustment latitude, attendance and absence requirements, and attendance and absence incentives [184].

Partly in line with the two models above, studies demonstrate that, besides illness, several *environmental* factors such as low replaceability, low control, conflicting demands [177], lack of work resources, time pressure [175, 177], high psychological demands, supervisory status, long work hours, low social support, job insecurity, and family life (i.e., home being more taxing than work) [175], can be positively associated with sickness presenteeism. In addition, *personal-level* determinants of sickness presenteeism include financial problems, lower education [177], conservative attitudes towards sickness absence, and lower age [175].

Two studies have touched on the relevance of personality characteristics to sickness presenteeism. First, finding it hard to resist other people’s wishes and expectations (i.e., individual boundarylessness) has been positively associated with sickness presenteeism, though the authors stated that further research is needed to explore and confirm this finding [177]. Second, a recent Danish study observed that the most important personal circumstance affecting going to work when ill was overcommitment (OC) [175]. OC emphasizes a cognitive–motivational pattern of coping with demands characterized by excessive work-related overcommitment and a high need for approval [185]. However, the operationalization of OC has changed considerably over time [186], and the widely used short version of the OC instrument (e.g., as used in the Danish study) is problematic in several ways. First, the operationalization of OC has unfortunately resulted in a gap between the formulation of the items used and the theoretical meaning of OC.

Overcommitment was originally operationalized based on two latent factors: *vigour* referring to successful coping, and *immersion* referring to a critical style of coping that reflects frustrated, but ongoing, effort and associated negative feelings. In turn, immersion consisted of four subscales measured by 29 items: need for approval (6 items), competitiveness and latent hostility (6 items), impatience and disproportionate irritability (8 items), and inability to withdraw from work obligations (9 items) [187]. As some studies could not replicate the factorial structure [186], and because the full instrument was considered too long for epidemiological research, the scale was shortened [187]. However, when the instrument was shortened, the first two dimensions of the original concept were completely dropped and the focus of five of the six remaining items was “inability to withdraw from work obligations”. One item also covered “impatience and disproportionate irritability” [187]. Hence, the items included in the short version of OC in fact focus on the phenomenon of perseverative cognition, often manifested in worries and rumination. Although worries and rumination might be related to personality characteristics (i.e., traits) [188], the bulk of the daily experience of worry is not predicted by trait measures [189]. Consequently, the short version of OC focuses on items not specifically measuring general trait characteristics, but rather on experiences or behaviours that could just as well result from intense environmental stress stimulus (e.g., “When I get home, I can easily relax and ‘switch off’ work” [reversed]; “Work rarely lets me go; it is still on my mind when I go to bed”; or “As soon as I get up in the morning, I start thinking about work problems”). Hence, there is a risk of overlap between the predictor (OC short version) and relevant outcomes, such as stress-related symptoms and exhaustion. The Danish study [175] thus contributes interesting knowledge of how perseverative cognition is related to sickness presenteeism. However, knowledge of how personality characteristics might affect the choice of whether or not to go to work when ill still needs to be elucidated.

In sum, recent studies suggest that going to work when ill might be a hazardous behaviour that might result in future health problems and decreased work ability. Theoretically, this behaviour depends on both personal and environmental factors. However, the empirical evidence concerning how personality characteristics are associated with this behaviour is still very scarce. This thesis research examines the relationship between performance-based self-esteem and frequent sickness presenteeism (**study IV**). Although it is not specifically a focus, sickness presenteeism was also touched on in **study III**.

Stress

Today, there is no all-embracing consensus as to the definition of stress, so use of the concept often mixes its various aspects. Ursin and Eriksen (2004) suggest that the term “stress” refers to four different factors that can be measured separately: a) stress stimuli, b) stress experience, c) a non-specific, general stress response, and d) feedback from the stress response [190]. An important aspect of this division is the emphasis on how a stimulus is filtered through individual cognitive appraisal (i.e., stress experience according to Ursin and Eriksen [195]). This mechanism is also underlined by Lazarus and Folkman (1984), who imply that a certain stimulus, perceived as negative by some, will be perceived as positive by others [190, 191]. If a particular stimulus or set of stimuli are appraised as threatening, the result is a stress response that activates the body, mobilizing physiological resources to initiate and improve performance. This arousal will then be

sustained until the reason for it is eliminated [190]. This physiological activation can also be seen as a bodily adaptation process with the objective of maintaining the body's balance [192] (in detail below). If the environment is appraised as taxing or exceeding a person's resources, *coping* is the process of constantly changing cognitive and behavioural efforts to manage these internal or external demands [191].

The cognitive appraisal process when facing stimuli appraised as a threat has often been described as the "fight-or-flight" process. However, this description has been criticized for being based on research including only men or male rats. Taylor et al. (2000) hypothesise that women's reactions can instead be described as a process of "tend-and-befriend". This means that women, to maximize the likelihood of survival when appraising stimuli as stressful, protect themselves and their offspring through nurturing behaviours (i.e., a tending pattern) and by socializing and connecting with social groups around them (i.e., befriending) [193].

Kinman and Jones (2005) have suggested that individuals' beliefs about stress affect both their perceptions and work-related actions or coping [38], and they observed that lay representations of occupational stress were not naïve but multifaceted as to cause and effect. However, little consensus was found as to how the concept of stress was interpreted, although stress seemed to be interpreted as a transactional process between the individual and the environment. Paradoxically (according to Kinman and Jones), secondary and tertiary stress management techniques were seen as more effective than interventions designed to prevent stress at work [38].

Individual consequences of stress

The individual consequences of stress ("the feedback from stress response", according to Ursin and Eriksen [195]), can be divided into five clusters: a) *affective* (e.g., anxiety, tension, and anger), b) *cognitive* (e.g., helplessness, cognitive impairment, and difficulty in decision making), c) *physical* (e.g., gastro-intestinal disorders, musculoskeletal pain symptoms, and sleeping disorders), d) *behavioural* (e.g., hyperactivity, impulsiveness, and increased stimulant consumption), and e) *motivational* consequences (e.g., loss of enthusiasm, disappointment, and boredom) [194-196]. It is important to note that stress per se does not immediately threaten health; on the contrary, it is a positive and vital response that facilitates the handling of threats and challenges [190]. However, a sustained high level of arousal can have detrimental effect on both psychological and physiological functioning, as it might both increase susceptibility to other health hazards and be directly pathogenic. In understanding how the body adapts or fails to adapt to daily life experiences, McEwen suggests that the term *stress* is ambiguous and even states that it is "less than helpful" [197]. To improve our understanding of ways to intervene, McEwen uses the concept of *allostasis*, which refers to the bodily process of achieving stability through change [198], to develop the *allostatic load model* [197]. Through allostasis, the autonomic nervous system, the hypothalamic pituitary adrenal axis (HPA), the cardiovascular system, the metabolic system, and the immune system protect the body when facing stimuli appraised as taxing [199]. In turn, the price of this adaptation is allostatic load or overload, i.e., the wear and tear resulting from either too much stress stimuli or inadequate management of allostasis [197, 199]. Unless this overload is balanced or reduced by sufficient recovery, it will contribute to health problems [197].

In sum, although use of the concept of stress is not uniform, studies suggest that an imbalance between high bodily arousal and recovery can result in both somatic and mental health problems. Because stress response is a product of both environmental conditions and individual appraisal and coping, new environmental conditions might provide new potential stress stimuli as well as obstacles to attaining sufficient recovery. Based on such changes, there was recently a call for qualitative studies of young women's experience of daily life, to forge a better understanding of stress stimuli and coping resources in this group [114]. In the present thesis, stress will mainly be treated as the bodily response to external stimuli appraised as taxing, i.e., stressors. The focus will be on conditions affecting the balance between stress and sufficient recovery (see McEwen above [197]). However, as **study III** is based on interviews, the respondents' views of stress may include different dimensions or interpretations of the concept of stress. It is important to note, in this regard, that laypeople's views of stress are not naïve but multifaceted as concerns cause and effect.

Theories of stress at work

Although some theories focus mainly on either individual or environmental factors, the core of theories of work-related stress is that behaviour, attitudes, and well-being are determined in an interactive relationship between the person and the work environment. Accordingly, in *the person–environment fit hypothesis* [200], stress does not arise from the individual or the environment separately; instead, stress is the result of a misfit between the person and the environment. A good fit can occur when the demands of the environment match the abilities of the person and when the needs of the person are matched by the supplies of the environment [200, 201]. However, this model has been criticized for being too focused on how the environment affects the person, little attention being paid to the possibility that the person may also affect the environment or that the person may to some extent choose the environment. A second criticism is that it is too static: in a continuous relationship between these elements, one can only provisionally assign variables as antecedents or consequences [191].

Going beyond this more general relationship between the environment and the individual, more specific factors, such as job demands and job control, have received considerable attention in recent decades. Job demands have been positively associated with stress, whereas job control [202] and social support has been negatively associated with stress [203]. Nevertheless, as the importance and direction of these conditions in relation to stress were primarily examined in *industrial* work settings, it has been questioned whether they would completely apply in a modern work context [204]. For example, the first dimension of control [202] comprises an employee's possibility to influence what to do and how to do it (i.e., decision authority), whereas the second dimension comprises how an employee's knowledge and skill are used and developed (i.e., skill discretion or intellectual discretion). However, in a contemporary work context, some employees might perceive in-service training and ingenuity (i.e., skill discretion) as a demand and a stressor [204]. Moreover, a recent study observed the importance of personality in relation to job control (i.e., decision authority). While individuals with an internal locus of control and high self-efficacy can benefit from high job control, for individuals with an external locus of control and low self-efficacy, high job control predicted poorer health as stressors increased [205].

Developed in the tradition of occupational health research, *the role stress theory* emphasizes how discrepancies between role expectations and pressure might result in conflict,

ambiguity, and overload, in turn leading to stress. Briefly stated, role *conflict* arises when role expectations are contradictory, role *overload* arises when one is asked to do more than time permits, and role *ambiguity* arises when a certain role or performance is perceived as unpredictable or vague [206]. If this theory is applied to a gendered situation including both occupational and private roles, it might cover the potential dilemma of multiple life roles [207]. On the other hand, *the role expansion theory* assumes that having multiple roles (e.g., engagement in both occupational and private life) is beneficial, as a particular role produces a net gain with respect to costs [208].

Yet another hypothesis refers to an exchange process between efforts expended at work in relation to the achieved intrinsic reward [185, 209]. Imbalances between effort and intrinsic reward have been associated with elevated risk of depression, anxiety, somatization, chronic fatigue, psychotropic drug consumption [210], and coronary disease [211, 212]. This reasoning also takes individual differences in the experience of effort–reward imbalance into consideration. People characterized by an excessive work-related striving behaviour in combination with a strong desire to be approved (i.e., overcommitment) are said to have an increased risk of stress due to effort–reward imbalance. Overcommitment can even be considered a risk factor on its own without this imbalance. According to Siegrist (2004), people with this motivational pattern might expose themselves more often to high demands at work or expend more effort than is formally needed [187] (see also OC above).

In sum, the present thesis will not take any specific stress theory as its starting point. As the situation of the increasing number of highly educated young women working in occupations traditionally dominated by men (**study III**) has attracted little previous attention in health research, an inductive approach was chosen. However, the final model touches on several dimensions previously closely related to stress and coping (see the section “Discussion”).

Aims of the thesis

The overall aim of this thesis is to contribute to our understanding of contemporary aspects of health and performance among young adult women and men.

Specific aims:

- Examine the prevalence of a combined assessment of self-rated very good health and no performance impairment in young adult women and men in higher education (**study I**).
- Longitudinally compare maintained health and performance over two years between young women and men in higher education (**study II**).
- Investigate how stability in health-related behaviours, in conditions at work/school, and in issues of work-home interference predicts maintained health and performance in young adult women and men (**study II**).
- Develop an empirically grounded theory of stress and recovery among highly educated young women (**study III**).
- Examine whether performance-based self-esteem predicts frequent sickness presenteeism among young adult women and men (**study IV**).
- Examine whether the relationship between performance-based self-esteem and frequent sickness presenteeism interacts with environmental and personal factors (**study IV**).

Ethical considerations

Studies I–III were approved by the Research Ethics Committee at the University of Gothenburg (**Studies I and II**: approval number 491-01; **Study III**: approval number 144-08). Requirements concerning informed consent and anonymization of results were met in all four studies. In **study III**, all participants signed written consent forms to participate in the study before being interviewed.

Methods

The thesis research was based on three separate sources of data: two longitudinal cohorts, *Health 24 years* (H24) and *Work Ability Young Adults* (WAYA), and one qualitative interview study. Table 2 below provides a general overview of the study design, measurements, participants, distribution of men and women, and participant age range in the four constituent studies of the thesis. The following section will present the 1) study design, 2) data collection and study sample, 3), measurements, and 4) data analyses used in the quantitative studies. Thereafter, the method used in the qualitative study will be described.

Table 2. Descriptive characteristics of the four constituent studies of this thesis

Study	Type of study	Measurement	Work/studies	Participants (<i>n</i>)	Sex	Age
I	Cross-sectional	Questionnaire	Students	2358	44% women	19–25
II	Longitudinal	Questionnaire	Students	1172 at baseline	44% women	19–27
III	Qualitative study (grounded theory)	Interviews	Highly educated professionals	20	100% women	23–29
IV	Longitudinal	Questionnaire	Work, studies, and vocational practice	5582 at baseline	62% women	20–25

Study design of the quantitative studies (studies I, II, and IV)

Study I

A cross-sectional design was used to examine possible differences between women and men in the prevalence of a combined assessment of very good health and no performance impairment (measure described below) in the baseline of the H24 cohort (cohort described below). It has previously been suggested that it is desirable to compare men and women in very similar situations, to minimize apparent differences in work-related health conditions between women and men [78, 110]. Hence, **study I** examined possible differences in a fairly homogenous study sample, to limit the effect of previously well-established determinants of inequalities of health between women and men.

Study II

A longitudinal design was used to examine the maintenance of health and performance using the baseline, one-year follow-up, and two-year follow-up of the H24 cohort. Note that the focus was not on studying change over time or prevalence at a certain time. Instead, the focus was on maintenance of health and performance at all three time points in relation to not maintaining health and performance during this time. The study was based on the same reasoning about health inequalities in fairly homogenous samples as described above for **study I**.

Study IV

Using the baseline and one-year follow-up of the WAYA cohort (described below), a retrospective longitudinal study was used to examine the relationship between performance-based self-esteem and frequent sickness presenteeism (>5 times/year).

Data collection and study sample in the quantitative studies (studies I, II, and IV)

Study I

The samples in **studies I** and **II** were both derived from the H24 cohort, originally focusing on the effects of information and communication technology (ICT) usage on health and work ability. The baseline data were collected in 2002 and 2004. Using college and university enrolment lists, invitations ($n = 1728$) describing the cohort and offering respondents tickets to the cinema were sent by postal mail to all medical students and computer science students aged 18–25 years in five cities (i.e., Göteborg, Lund, Linköping, Borås, and Skövde) in western and southern Sweden in 2002. The geographical selection was made to facilitate possible medical examinations in future subgroup studies. Students who agreed to participate received a second letter, with an individual user name and password for the Web-based questionnaire. In 2004, an additional recruitment was undertaken in which 1539 students received a postal invitation using the same procedure as in 2002, except that they could agree to participate simply by entering a Website and responding to the Web-based questionnaire. Of the 1435 invited medical students, 74% ($n = 1067$) participated in the study and of the 1832 invited computer science students, 71% ($n = 1291$) participated. Dropout analyses revealed no major differences according to sex among individuals who did not participate. In sum, the sample in **study I** consisted of 2358 respondents (women $n = 1046$, men $n = 1312$) aged 19–25 years (unfortunately, the age range in the published article, **study I**, is incorrectly specified as 18–25 years). The sampled women and men were fairly homogenous in terms of most background variables. However, the women spent slightly more time on their studies and were more likely to be married or cohabiting than were the men. Very few of either sex had children (see Table 3).

Table 3. Descriptive data for women and men at the baseline of the H24 cohort (study I); values are stated as means unless otherwise noted

Factor	Women ($n = 1046$)	Men ($n = 1312$)
BMI (mean)	21.6	23.0
Exercise (hours/week: mean)	3.8	4.2
Smoking (%)	5.8	5.6
Have children (%)	1.3	2.1
Married or living with a partner (%)	28.9	20.2
Gainful employment (hours/week: mean)	2.9	3.7
Scheduled study (hours/week: mean)	16.4	13.7
Unscheduled study (hours/week: mean)	18.2	16.0
Non-profit work (hours/week: mean)	2.3	2.5

BMI = body mass index.

Study II

The sample in **study II** consisted of respondents from the H24 cohort who completed the same questionnaire at baseline (t1), one-year follow-up (t2), and two-year follow-up (t3). Respondents who were not studying when the questionnaires were distributed were excluded to obtain a more homogenous study sample. The reference group was simplified by excluding respondents who *gained* very good health and no performance impairment and then maintained it (women $n = 102$,

men $n = 75$). Due to respondents who completed the questionnaire at all three time points, but abstained from responding to relevant items (i.e., internal missing, $n = 94$), the final study sample of $n = 1172$ (see Figure 5). In the published article baseline was given as, $n = 1266$. However, this figure did also include internal missing, $n = 94$.

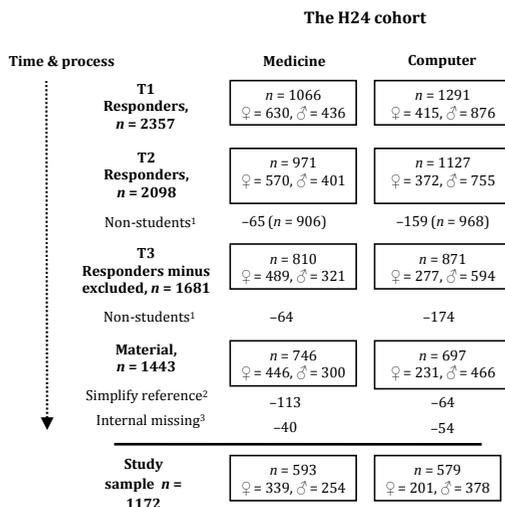


Figure 5. Participant flow through the stages of data collection for study II.

Characteristics at baseline of respondents excluded due to internal missing, in relation to the final study sample, are described in Table 4.

Table 4. Baseline characteristics (prevalence) for internal missing compared with the final study sample

	Characteristics of internal missing at baseline, $n = 94$		Characteristics of study sample at baseline, $n = 1172$	
	Men ($n = 59$)	Women ($n = 35$)	Men ($n = 632$)	Women ($n = 540$)
Studying medicine	22%	77%	40%	63%
Studying computer science	78%	23%	60%	37%
Very good health and no performance impairment at baseline	25%	11%	35%	29%
Too high demands at baseline	25%	63%	29%	51%

At baseline, the participating women and men were fairly homogenous in terms of most background variables; only minor differences were apparent, including that the women spent more time on their studies than did the men and that more women than men were married or cohabiting.

Study IV

Study IV was based on data from a population-based cohort of young adults in Sweden, i.e., Work Ability Young Adults (WAYA) [213]. Invitations to participate in the study were mailed to a randomly selected population of 20,000 young adults, 20–24 years old at baseline, t_1 . Those who responded and agreed to participate in future studies also received a second questionnaire at

the one-year follow-up (t_2 ; see Table 5). Participants reporting that they were on parental leave or furlough of over one month at t_2 were removed from the study sample ($n = 113$), as were those who reported at t_2 that they had been on long-term sick leave for either 25–99 days or 100–365 days ($n = 139$). Respondents responding that sickness presenteeism was not an applicable question at t_2 , as they had not been ill in the previous 12 months (i.e., response alternative five on the sickness presenteeism question), were also excluded from the analyses ($n = 116$). Note that some of these respondents occur in more than one of the excluded groups. Thus, the total number of removed respondents was $n = 247$. The study sample did not diverge greatly from population data from Statistics Sweden in terms of marital status (3% versus 5% in the total population) or urban–rural place of residence (45% versus 45%). However, men (39% versus 56%) and individuals with at least one parent born outside Sweden (10% versus 18%) were slightly underrepresented in the final study sample [213].

Table 5. Descriptive characteristics of the WAYA cohort

	Total		Men		Women	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Invited	20,000		10,000		10,000	
Baseline	7125	36*	2778	28*	4347	44*
“Yes” to participating in follow-ups	5829	82*	2139	77*	3690	85*
One-year follow-up	4163	71*	1458	68*	2705	73*

* Percent of the level above

Descriptive statistics for the baseline are presented in Table 6.

Table 6. Descriptive statistics for the study sample of study IV at baseline

	Women, <i>n</i> = 3478		Men, <i>n</i> = 2104	
	%	<i>n</i>	%	<i>n</i>
<i>General health</i>				
Good or very good	71.9	2488	80.0	1672
<i>Main occupation</i>				
Working as employed	41.0	1388	52.8	1085
Self-employed	0.7	25	1.9	39
Studies (university)	38.3	1297	30.9	635
Other studies/educational activities	8.3	282	6.1	125
Long-term sick leave (>1 month)	1.5	52	0.8	16
On furlough or parental leave (>1 month) ¹	2.9	99	0.3	6
Unemployed or in vocational training/work placement ²	7.2	245	7.2	148
<i>Economic or juridical problems (last 12 months)</i>				
Yes	13.6	468	14.7	305
<i>High psychological demands in work/educational activities</i>				
Strongly agree	29.6	1004	26.4	539
<i>Have control over and can handle problems arising in my work/educational activities</i>				
Agree or strongly agree	86.1	2914	88.8	1807
<i>Access to support and help when I need it, at work/educational activities</i>				
Agree or strongly agree	74.1	2505	77.6	1576
<i>Given my effort at work/educational activities, I get the rewards I deserve</i>				
Agree or strongly agree	70.5	2379	77.7	1452
<i>Physical demands at work/educational activities</i>				
Mostly sitting still	42.0	1394	38.3	773
Sitting half of the time	14.1	467	10.2	206
Mostly standing	8.3	277	7.4	149
Mostly walking, lifting, and carrying a little	18.9	629	17.4	352
Mostly walking, lifting, and carrying a lot	13.6	453	17.5	353
Heavy physical work	3.1	102	9.3	187

¹ Respondents choosing this alternative at t_2 were removed from the sample.

² Unemployed did not respond to the sickness presenteeism item and were not included in the analyses.

Measurements in the quantitative studies (studies I, II, and IV)

Very good health and no performance impairment (study I)

In **study I**, the outcome was based on two components. The first of these was a self-rated general health question: “How do you rate your general state of health?”, the response alternatives being “very good”, “fairly good”, “neither good nor bad”, “fairly bad”, and “bad”. The second component was a question concerning health-related impairment of performance: “Have any of the following symptoms affected your general level of performance over the past 30 days: skin troubles; eye troubles; pain in the muscles/joints; pain in the neck, back, shoulders, arms, hands; anxiety, depression; stress [a definition, distinguishing stress as response from stress as stimuli, preceded this question]; sleeping disorders; other symptoms?”, the response alternatives being “yes” or “no”. The outcome was dichotomized and individuals were considered to manifest the outcome if they reported “very good” health and did not report lower levels of performance due to health problems. In the published version of **study I**, the outcome measure is labelled “Excellent health and health-related performance (EHHP)”. However, this thesis will use the more accurate formulation “very good health and no performance impairment”.

Descriptive variables (study I)

Since the scales varied among the variables, scales that did not represent simple “yes/no” responses were dichotomized according to either scientific or clinical practice, i.e., body mass index (BMI) and exercise, or distribution (i.e., the third quartile was used as threshold), as presented in parentheses below. *Individual variable*: overweight (BMI \geq 25) [214]. *Health-related behaviour variables*: smoking (“yes/no”) and exercise ($>$ 3.5 hours/week) [215]. *The mood index* [216, 217]: This is a well-validated instrument consisting of the two dimensions stress and energy. In the present study, stress was measured as a dimension ranging from negatively valued mood states of high activation (e.g., “stressed”) to positively valued mood states of low activation (e.g., “relaxed”). Energy was measured as a dimension ranging from positively valued mood states of high activation (e.g., “energetic”) to negatively valued mood states of low activation (e.g., “dull”). Respondents can be divided into four groups based on whether they are dichotomized as high or low in stress and energy, based on the mean \pm 95% confidence interval (CI) of the whole group, which was 3.49 for stress and 3.92 for energy. The four mood groups are labelled “exhausted” (high stress–low energy), “dedicated under pressure” (high stress–high energy), “bored” (low stress–low energy), and “dedicated without pressure” (low stress–high energy). *Mental and physical health symptoms*: Stress at the moment [218] ($<$ 2 on a five-point scale); prolonged stress, continuously for seven days over the past 12 months, based on Elo et al. [218]; inclination to do things you usually like [219]; feeling uneasy [219]; palpitations, frequency over last 30 days ($>$ 1 on a five-point scale); worries and smarting pain in the stomach, frequency over last 30 days ($>$ 1 on a five-point scale); headache, frequency over last 30 days ($>$ 2 on a five-point scale); frequent awakenings, frequency over last six months ($>$ 1 on a five-point scale) [220]; skin troubles; tiredness in the eyes; pain in the upper back and neck; pain in lower back; pain in shoulders (“yes/no”).

Maintained health and performance (study II)

The outcome measure of **study II** was based on the same combined assessment as used in **study I** (see above). However, the main outcome in **study II** was stability of health and no performance impairment over the last two years – that is, *maintained health and performance*, including respondents categorized as having very good health and no performance impairment at all three time points, i.e., baseline (t_1), the one-year follow-up (t_2), and the two-year follow-up (t_3). The reference group consisted of respondents (1) who did not have very good health and no performance impairment – at any time point; or (2) who had had it and lost it. Hence, to clarify the reference group, respondents without very good health and no performance impairment at t_1 , but gaining it at t_2 (and maintaining it), or t_3 were excluded (women $n=102$, and men $n=75$).

Explanatory and descriptive variables (study II)

Most longitudinal studies use explanatory factors measured at one time point. However, if health promotion is the objective, the aim would be to reach stability in health-related behaviours and conditions (e.g., sufficient exercise and not smoking). In **study II**, stability in a variable was defined as its having elicited the same response on three (t_1 , t_2 , and t_3) occasions. The outcome was dichotomous and all other alternatives were used as reference. The variables were dichotomized according to scientific or clinical practice (i.e., smoking, BMI, and exercise) or distribution (i.e., the highest quartile at baseline was used as threshold). The potential predictors concerned the following: *stability* in marital status (married/cohabiting, “yes/no”); scheduled schoolwork (<20 hours/wk), unscheduled schoolwork (<25 hours/wk); *health-related behaviours* – not smoking, sufficient exercise (>3.5 hours/wk) [215], not being overweight (BMI <25 kg/m²) [214]; *ergonomic exposure* – low computer use (fewer than two episodes of using the PC/laptop for >4 hours without a break during the previous week) [221]; *perceived demands* – different levels of response to the question “How do you feel about the demands in your study/work situation?”, for example, not too high demands (“completely agree” and “partly agree”), in balance with demands (“neither too high nor too low”) [222]; *psychosocial exposures* – good relations with teachers/supervisors, good relations with classmates [223]; *work-home interference* – study demands do not affect home/family life negatively, demands from home/family do not affect school/work negatively [224].

Sickness presenteeism (study IV)

Sickness presenteeism was measured at t_2 using the following question: “How many times over the previous 12 months have you attended work/educational activities despite feeling that you really should have taken time off because of your state of health?” The response alternatives were 1) “never”, 2) “once”, 3) “2–5 times”, 4) “more than five times”, and 5) “not an applicable question – have not been ill over the past 12 months” (excluded from the analysis, see above). Only individuals working, studying, or engaged in vocational training/work placements answered the question. Because two recent longitudinal studies observed that the strongest relationship between sickness presenteeism and future long-term sick leave was for individuals reporting sickness presenteeism more than five times in the previous year [159, 161], the present study dichotomized sickness presenteeism as 1 – “more than five times” versus 0 – “all other frequencies”.

Performance-based self-esteem (study IV)

The instrument measuring performance-based self-esteem (PBSE) was originally an index comprising four statements [50]. In the present study, two of the original statements were included after discussion with Prof. Hallsten and based on considerations of specificity and sensitivity; these two statements were: 1) “I think that I sometimes try to prove my worth by being competent”, 2) “Occasionally, I feel obsessed with accomplishing something of value”. Due to the item formulation, the risk of overlap in relation to outcomes was small, and the correlation of items 1 and 2 with the overall PBSE index was $r = .79$ and $r = .81$, respectively. The response format followed the original one, including a five-point Likert scale with the endpoints “fully agree” and “fully disagree”. An index was created based on the mean values. A test–retest study of 31 individuals (aged 20–24 years) indicated a correlation of $r = .70$ (Pearson’s r) for the two-item version of the PBSE index (interval of two weeks) [213]. To capture the theoretical stability of PBSE, we created an overall index based on the two PBSE indexes calculated at t_1 and t_2 .

Potential confounders and synergetic variables (study IV)

The following variables were included as covariates (at t_1) to control for potential confounding and interaction effects. “Main occupation” was determined by the following response alternatives: employed, self-employed, university studies, other educational activities, long-term sick leave, parental leave/on furlough, and unemployed. Three items captured the concepts *control*, *psychological demands*, and *social support* [225] and one item captured *balance between effort and intrinsic reward* [209]. All items were formulated as statements with four response alternatives each, as follows: *control* (“I feel that I have control over and can handle things that happen in my work/educational activities”), *psychological demands* (“I am exposed to high demands and expectations in my work/educational activities”), *social support* (“When I have problems in my work/educational activities, I have access to support and help there”), and *balance between effort and intrinsic reward* (“Considering the effort I put in and what I achieve in my work/educational activities, I receive the appreciation I am entitled to”). *Physical work demands* was captured by the item “How much do you move around and exert yourself physically in your work/educational activities?”; the responses were ranged along a six-point Likert scale from “mostly sitting still” to “heavy manual labour”. Before the questionnaire was distributed, all items but “physical work demands” (added later) were included in a test–retest study conducted after a two-week interval, and satisfactory short-term reliability was observed [213]. *Health status* was captured by one general health question (with five response alternatives ranging from “very good” to “very poor”), while the presence of *financial or juridical problems* was gauged using a yes/no question.

Data analyses (studies I, II, and IV)

Study I

To examine the consistency in the combined measure of very good health and no performance impairment, the relationship between various levels of self-rated health performance was investigated. To examine the relationship between very good health and no performance impairment and the descriptive variables, prevalence ratios (PRs) with 95% confidence intervals

(95% CIs) were calculated for the descriptive variables and for health and performance in the whole study population ($p < 0.05$). To investigate the stability of these associations, PRs with 95% CIs were also calculated for several subgroups, i.e., subgroups of sex, education, and sex within the same course of study. Finally, to investigate the prevalence of very good health and no performance impairment according to sex and educational course, PRs with 95% CIs were calculated. Data were processed using JMP, version 5.1 (SAS Institute, Cary, NC, USA) and PRs were calculated via survival analyses (proportional hazards platform) with the time set to 1 [226]. However, an error that belonged to the statistical program was found in April 2010. Therefore, all PRs with 95% CIs were recalculated manually and in JMP version 8. A letter regarding the errors was sent to the journal in which the study was published (*Gender Medicine*) and to the provider of JPM version 5.1. In the “Results” section below, correct PRs with 95% CIs are given. The correct PRs did not change the direction of the previously found associations.

Study II

To compare the prevalence of maintained health and performance, prevalence ratios (PRs) with 95% confidence intervals (95% CIs) were calculated for women in relation to men. Determinants of maintained health and performance were examined by calculating prevalence ratios in bivariate and multivariate analyses. All variables that were statistically significant (i.e., confidence interval not covering one) were entered into the multivariate analyses. We also tested for product terms (statistical interaction). In each analysis, product terms and 95% CIs were calculated between the *women/men* variable and the explanatory variables. Since power was lower among the women than the men (i.e., number of cases), a 90% CI was used for all separate analyses (95% CI was used for the men) to lower the risk of missing possible associations of relevance. This is supported by recent trends in epidemiology emphasizing the importance of interpreting the magnitude together with the confidence interval and not always looking for a 5% significance level [227]. Data were processed using SAS version 9.1 (SAS Institute, Cary, NC, USA) and proportions and their differences were calculated using CI analyses outlined in Altman et al. [227]. Using the PHREG procedure in SAS, all PRs were calculated via survival analyses with the time set to 1 [226].

Study IV

The primary research question was examined through a process of regression analysis. First, unadjusted logistic regressions were calculated for PBSE in relation to sickness presenteeism. These results were then presented as prevalence ratios and unadjusted prevalence and 95% CIs for low PBSE (PBSE = 1) and high PBSE (PBSE = 5) in relation to sickness presenteeism. Second, bivariate logistic regressions were calculated for PBSE in relation to sickness presenteeism, including one potential confounder at a time. After testing for collinearity ($>.70$), all variables having p -values $<.15$ were included in a multivariate logistic regression model. When calculating multivariate logistic regressions, all variables having p -values $<.10$ were kept in the model. However, variables having p -values $\geq .10$ were included if their removal would change the coefficient of other variables in the model by more than 20% [228]. This rather high limit of the p -value was chosen so as not to miss potential confounders of importance. For the

parameter estimates, 95% CIs were calculated. We also tested for product terms (statistical interaction), $p \leq .05$.

For the second research question, we investigated whether the associations between PBSE and sickness presenteeism differed depending on the levels of the contextual factors. In a linear regression, this can be examined through product terms (statistical interaction). However, as discussed by Rothman and Greenland in chapter 18 of *Modern Epidemiology* [229], this is not the case in a logistic regression. Consequently, synergy effects were examined by means of causal interactions [229]. These interactions were calculated by dividing the prevalence of sickness presenteeism into intervals according to specific exposures at different levels of PBSE and of the examined variables. Note that this procedure leads to absolute rather than relative effect measures. To examine possible differences between women and men, all analyses were also conducted separately for these groups. Data were processed using SAS version 9.1 (SAS Institute, Cary, NC, USA). Additional calculations were conducted in Excel and proportions and their differences were calculated using CI analyses outlined in Altman et al. [227].

Method of the qualitative study (study III)

Design and setting

Our point of departure was grounded theory [230, 231]. One aim of grounded theory (GT) is to generate hypotheses, theories, and tentative models on an empirical basis. This approach was chosen because the observed societal changes (e.g., individualization) in combination with the de-standardization and prolongation of the transition to adulthood might have generated new living conditions that impinge on stress and recovery for young adult women. This might also be particularly manifested among the growing number of young, highly educated women moving into occupations traditionally dominated by men. Hence, we wanted to go beyond the sources of stress for women previously fairly well studied in occupational health research, i.e., gender-specific exposure caused by a segregated labour market, unequal distribution of power and resources, and a greater total workload. The present study was carried out in one of Sweden's largest cities, as stress among young people has been found to be especially pronounced in urban settings [11].

Data collection and participants

Sampling was conducted in three steps. First, to provide the best answer to the research question (i.e., fit), our study group was chosen according to four criteria: (a) high educational level, (b) working at least halftime, (c) have no children, and (d) not in traditional women's occupations (e.g., care giving and education). Women with children were excluded as the mean age of having one's first child in Sweden is 29 [10], and having children would certainly greatly affect the participants' living conditions in a way that was not the primary target of this study. Second, maximizing the variation of data or incidents through strategic sampling resulted in participants from five occupational fields, i.e., company lawyers, physicians, economists, engineers, and architects. All these occupational fields are traditionally dominated by men in Sweden, but are currently being entered by an increasing number of young women. A misunderstanding resulted in the recruitment of one participant, a human resources manager, not meeting the above criteria.

However, she worked in an industrial setting and as her interview contributed rich descriptions corresponding to the emerging categories, these data were included in the analysis. To maximize data variation, the initial recruitment process used three routes: a) the researchers contacted key people in relevant workplaces, who in turn distributed contact information and information on the study; b) based on recommendations from people who had heard about the study, potential participants who met the study's criteria were contacted directly and given information on the study, and c) after a few interviews had been conducted, snowball sampling was applied (both for variation and to enter more deeply into issues). The distributed information included a study description, confidentiality assurance, and contact information. Third, as the analysis developed, decisions regarding ongoing data collection were based on the emerging theory as a property of theoretical sampling.

We interviewed 20 highly educated and fully employed women 23–29 years old. Having a certain stress level was not a criterion in the strategic sampling, and the interviewer judged that the stress level varied considerably between informants. According to the ideas of grounded theory, we started by “casting the net” very wide, beginning the interviews with, “Tell me about sources of stress in your life”. From the responses to this, ideas emerged as to what to ask next in the interview, for example, “Could you describe how you experience these stressful periods?” and “Tell me how you handle the relationship between stress and recovery in these situations”. More specific questions for use in later interviews emerged from the analysis, concerning, for example, postponing health and the balance between work and private life. This procedure is also used in what is known as theoretical sampling [232]. The interviews were audio recorded and field notes were taken to document reactions and observations that could reveal contextual dimensions of the interviews. All interviews were carried out face-to-face by the first author and lasted up to 90 minutes.

Data analysis

According to grounded theory, data collection and analysis occur simultaneously. The analysis was conducted in two hierarchical steps. First, after each of the first eight interviews, the recordings were transcribed verbatim and analysed line by line, together with the field notes. This open coding was based on the central research questions of the study and generated short codes close to the data. Keeping the initial open codes very close to the data served to counteract any effects arising from researcher preconceptions. The later interviews were analysed in an analogous process using field notes and careful listening to the audio recordings (the selective coding resulted in various passages being transcribed even from later interviews). Questions such as “What is actually happening in the data?” and “What does the informant do?” were put to the data and the initial codes were constantly compared with each other and with the data. These comparisons sequentially generated categories, which in turn were compared with each other and with the open codes. In this process of constant comparisons [230], categories were identified, labelled, and defined. Eventually, “ambiguity overload” was identified as the core category, utterly central to the data and to the emerging conceptual framework. Once the core category had emerged, the next step in the hierarchical coding process started and a more focused or selective coding was carried out. This coding was delimited to codes linked to the core category. At this point, our selections were guided by theoretical sampling, which aims to improve the analysis and reach saturation by specifying the properties of and distinguishing between categories. Several

indicators of saturation were already noted after 16 interviews, i.e., high replication of data connected with the emerging categories and verification of incidents and features by several participants [233]. However, to challenge the emerging categories, another four interviews were conducted and analysed. Because the data from these interviews did not contribute to any new qualities or properties of the core category, saturation was judged to have occurred. Theoretical and detailed memos in the form of text and figures were created throughout the analytical process. These memos recorded ideas, presumed associations, and theoretical reflections related to each of the emerging categories. The initial open coding was conducted by the first author, whereas the ongoing comparison and selective coding was conducted together with and in consultation with the second author. Throughout the process, the authors tried to maintain theoretical sensitivity by continuously reflecting on and discussing the emerging results in relation to personal and professional experiences and familiarity with the relevant literature. As this process might raise the risk of emerging results mirroring the personal qualities of the researchers [234], the authors endeavoured to discuss any possible prejudices and pre-understandings that could influence the analytical process. The “theory of ambiguity overload” was generated from patterns that clearly repeated themselves across the data. Quotations were first translated by the authors, then sent to a professional translator together with the original Swedish text, and finally edited by the authors so as best to capture the actual utterances of the participants.

Results

Early inequalities in health and performance (studies I and II)

Study I

The relationship between the two components – very good health and no performance impairment – was strong. Few individuals who reported very good health experienced impaired performance, and vice versa. However, of the respondents who rated their health as very good, 15% also reported impaired performance (see Table 7).

Table 7. Proportional distribution between no performance impairment and performance impairment in relation to level of self-rated health

General health	No performance impairment (%)	Performance impairment (%)
Very good	85	15
Fairly good	68	32
Neither good nor bad	58	42
Fairly bad	38	62
Bad	18	82

Fewer women (24.3%) than men (29.8%) had very good health and no performance impairment; the PR was 0.81 (0.71–0.93). Women were also less likely than were men to have very good health and no performance impairment within each course of study; the PR was 0.68 (0.54–0.87) for computer science students and PR 0.74 (0.62–0.88) for medical students.

Because marital status is known to affect the health of both women and men [235], health and performance were also calculated separately for single or married/cohabiting respondents. In line with the main findings, single women were less likely than were single men to have very good health and no performance impairment; PR 0.76 (0.64–0.89). However, among married/cohabiting respondents, no difference in health and performance was observed between women and men; PR 1.00 (0.77–1.30).

More women than men also found that work/university demands were too high and that such demands affected their private lives. Women also had a higher prevalence of all studied symptoms and of the high stress–high energy combination. However, men had higher BMIs and a higher prevalence of the low stress–low energy (bored) combination (see Table 8). No differences were observed between women and men in behaviours such as smoking or amount of exercise, with PRs of 1.03 (0.74–1.44) and 0.91 (0.83–1.00), respectively.

All studied symptoms were negatively associated with the measure of very good health and no performance impairment for both women and men. Low stress in combination with high energy was positively associated with very good health and no performance impairment, whereas a negative association was found in relation to high stress–high energy, high stress–low energy, the demands at work/study were too high, and these demands affecting the respondent’s private life, all of which were negatively associated with health and performance (see Table 9).

Table 8. Prevalence ratios (PRs) for an individual factor, psychosocial factors, mood index, and symptoms, for women versus men (only statistically significant associations are shown)

	PR	95% CI
<i>Individual factor</i>		
Overweight (BMI ≥ 25)*	0.46	0.37–0.58
<i>Psychosocial factors</i>		
Demands at university/work are too high	1.75	1.58–1.93
Demands at university/work affect my private life	1.60	1.33–1.91
<i>Mood index</i>		
Low stress–low energy (bored)	0.47	0.39–0.57
High stress–high energy (dedicated with pressure)	1.93	1.67–2.24
<i>Symptoms</i>		
Stress at the moment	1.12	1.08–1.17
Prolonged stress	1.40	1.30–1.51
Inclination to do things you usually like	1.27	1.12–1.44
Uneasy feelings	1.30	1.16–1.45
Palpitations	1.29	1.13–1.47
Worries and stomach ache	1.67	1.54–1.81
Headache	2.53	2.07–3.09
Frequent awakenings	1.46	1.35–1.57
Skin troubles	1.41	1.18–1.68
Tiredness in the eyes	1.51	1.22–1.87
Upper back and neck pain	2.24	1.86–2.69
Lower back pain	1.59	1.29–1.95
Shoulder pain	1.66	1.30–2.13

* BMI = body mass index

Table 9. Association between very good health and no performance impairment, mood index scores and psychosocial factors, for women and men

Variable	Prevalence Ratio (95% CI)	
	Women	Men
<i>Mood index</i>		
Low stress–high energy (dedicated without pressure)	2.38 (1.96–2.90)	1.78 (1.50–2.11)
Low stress–low energy (bored)	1.25 (0.87–1.79)	1.17 (0.96–1.42)
High stress–high energy (dedicated with pressure)	0.70 (0.55–0.88)	0.55 (0.40–0.75)
High stress–low energy (exhausted)	0.24 (0.13–0.42)	0.32 (0.22–0.47)
<i>Psychosocial factors</i>		
The demands at university/work are too high	0.67 (0.60–0.76)	0.61 (0.49–0.76)
The demands at university/work affect my private life	0.39 (0.26–0.58)	0.41 (0.27–0.61)

Study II

Fewer women (10.4%) than men (17.9%) had maintained health and performance over two years; the PR was 0.58 (0.35–0.74). This result was even more prominent when the two educational courses were analysed separately: the PR for computer science was 0.39 (0.19–0.79), while that for medicine was 0.51 (0.35–0.74). More women than men maintained stable conditions (two-year stability) regarding relationships (19% versus 14%), not being overweight (87% versus 74%), not working too long on the computer without a break (53% versus 25%), and perceiving too high demands (30% versus 10%). More men than women maintained stable conditions

regarding not having scheduled schoolwork of >20 hours/week (34% versus 25%), perceiving a balance in demands (37% versus 19%), and not having study demands negatively affect home/family life (27% versus 14%).

In the bivariate analyses, studying computer science rather than medicine, having less scheduled schoolwork, and perceiving too high demands were predictors of *less* maintained health and performance, while not too much unscheduled schoolwork, low computer use, balance in demands, good relations with teachers/supervisors, good relations with classmates/co-workers, and less work–home interference predicted maintained health and performance in both women and men. In men but not women, not smoking, not being overweight, and getting sufficient exercise predicted maintained health and performance. However, the direction of the point estimates was the same. The size of the point estimates differed little for the predictors between men and women, except for the two variables covering work–home interference, for which women’s point estimates were clearly higher (see Table 10).

Table 10. Bivariate associations between two-year stable predictors and maintained health and performance analysed with prevalence ratios (PR, 90% CI for women; PR, 95% CI for men)

Stable predictors over two years	Maintained health and performance	
	Women (cases = 56)	Men (cases = 113)
	PR (90% CI)	PR (95% CI)
Educational course (computer science/medicine)	0.32 (0.18–0.59) ¹	0.43 (0.29–0.63) ¹
Married or cohabiting (stable relationship)	0.81 (0.45–1.48)	1.41 (0.87–2.29)
Not smoking	2.51 (0.77–8.20)	8.55 (1.19–61.2) ¹
Scheduled schoolwork (<20 hours/week)	0.34 (0.16–0.74) ¹	0.34 (0.20–0.60)
Unscheduled schoolwork (<25 hours/week)	1.70 (1.07–2.72)	1.90 (1.28–2.82) ¹
Not being overweight (BMI <25)	1.90 (0.81–4.45)	1.61 (1.01–2.66) ¹
Sufficient exercise (3.5 hours/week)	1.41 (0.85–2.33) ¹	2.18 (1.47–3.22) ¹
Low computer use (few long episodes)	1.81 (1.13–2.91) ¹	2.11 (1.45–3.06) ¹
Too high demands	0.28 (0.14–0.57) ¹	0.33 (0.12–0.88) ¹
Balance in demands	2.32 (1.47–3.67) ¹	2.32 (1.35–4.01) ¹
Good relations with teachers/supervisors	2.29 (1.40–3.77) ¹	2.52 (1.70–3.73) ¹
Good relations with classmates/co-workers	1.70 (1.09–2.65) ¹	2.47 (1.71–3.57) ¹
Study demands do not negatively affect family/private life	3.83 (2.43–6.03) ¹	2.72 (1.89–3.95) ¹
Family/private life demands do not negatively affect studies	3.27 (1.92–5.61) ¹	2.22 (1.48–3.35) ¹

¹ Statistically significant factors for one-year maintained health and performance

When investigating whether the predictors for maintained health and performance differed between women and men, no statistically significant product terms were identified.

To adjust for covariance and elicit the most important predictors for women and men separately, multivariate analyses were performed. All statistically significant predictors in the bivariate analyses were entered into each of the two models. Sufficient exercise and good relations with classmates/co-workers predicted maintained health and performance in men, while good relations with teachers/supervisors predicted maintained health and performance in women. As in the bivariate analyses, the work–home interference variables were predictors of maintained health and performance (see Table 11).

Table 11. Multivariate regression on two-year stable predictors and maintained health and performance analysed with prevalence ratios (PR, 90% CI for women; PR, 95% CI for men)

Predictors stable over two years	Maintained health and performance	
	Women (cases = 56)	Men (cases = 113)
	PR (90% CI)	PR (95% CI)
Educational course (computer science-medicine)	0.56 (0.24–1.31)	0.78 (0.45–1.34)
Not smoking		3.07 (0.42–22.4)
Scheduled schoolwork (<20 hours/week)	0.47 (0.20–1.13)	0.59 (0.31–1.12)
Unscheduled schoolwork (<25 hours/week)	1.21 (0.71–2.07)	1.30 (0.82–2.04)
Not overweight (BMI <25)		1.23 (0.71–2.15)
Sufficient exercise (3.5 hours/week)		1.89 (1.23–2.91)
Low computer use (few long episodes)	1.13 (0.61–2.11)	1.21 (0.72–2.02)
Too high demands	0.50 (0.22–1.13)	0.57 (0.21–1.59)
Good relations with teachers/supervisors	1.91 (1.04–3.49)	1.49 (0.92–2.41)
Good relations with classmates/co-workers	1.07 (0.63–1.83)	1.79 (1.14–2.79)
Study demands do not negatively affect family/private life	2.79 (1.60–4.86)	2.07 (1.31–3.28)
Family/private life demands do not negatively affect studies	2.43 (1.29–4.59)	1.08 (0.66–1.77)

Only statistically significant factors from the bivariate analyses are included in the model

To examine whether the investigated variables could explain the differences in maintained health and performance between women and men, all variables were entered into a multivariate model including both women and men. Since the statistical significance (95% CI) and size of the point estimate for the women/men variable remained almost the same as in a bivariate analysis, PR 0.58 (0.42–0.80) versus 0.58 (0.38–0.87), the investigated variables did not explain the prevalence difference in maintained health and performance between women and men.

Conditions related to stress and insufficient recovery (study III)

A preliminary conceptual model was generated, describing the informants' experiences of stress and recovery. Occupying a central position in the data, *ambiguity overload* emerged as the core category. It refers to excessive uncertainty in diverse dimensions of life and describes the constant presence of *existential ambiguity*, *everyday ambiguity*, and *ambiguity in estimating what is "good enough"*, all of which result in an overload of continuous evaluation and decision making, which in turn leads to stress. Ambiguity overload was in turn the result of a synergy between *extensive individual ambition* and *a context overflowing with opportunities and demands*. Extensive individual ambition comprised *high enthusiastic drive*, which describes a positive force of ambition based on curiosity and joy, and *high performance striving*, which describes an internal striving to perform well and to be a high-performing person. A context overflowing with opportunities and demands was characterized by *gender-based structures* (consequences of facing and handling male-dominated work environments, and a perceived conflict between career and family), *lack of boundaries* (in terms of what, how, and where tasks should be executed), *numerous opportunities* (both existential and everyday), and *performance-focused surroundings* (both work and private surroundings were perceived as highly focused on performance and achievement). Hence, the forces leading to ambiguity overload resulted from neither individually ambitious young women alone nor a context overflowing with opportunities and demands; rather, it was a combination of these two dimensions.

If this ambiguity overload was not handled through individual (e.g., taking time out and weekends off) or contextual boundary setting (e.g., family or manager support in setting sufficient boundaries), the informants *became stuck* in a negative loop of stress and dysfunctional coping behaviour. Consequently, and through its six sub-dimensions – *taking on too much*, *negative comparisons with external benchmarks*, *lacking breathing space and an overview*, *aware but incapable of change*, *normalizing a high stress level*, and *postponing health* – this loop endangered the balance between stress and sufficient recovery (see Figure 6).

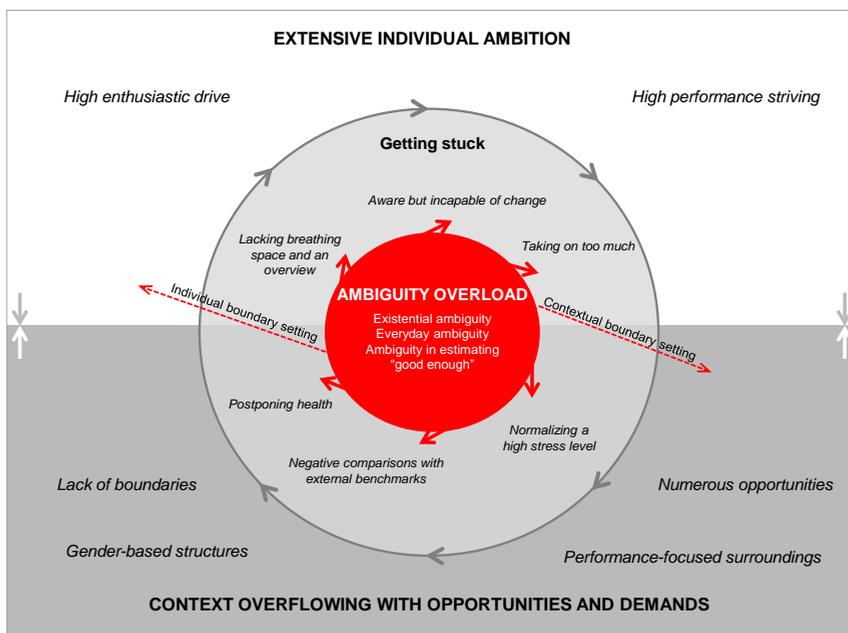


Figure 6. The empirically grounded theory of ambiguity overload

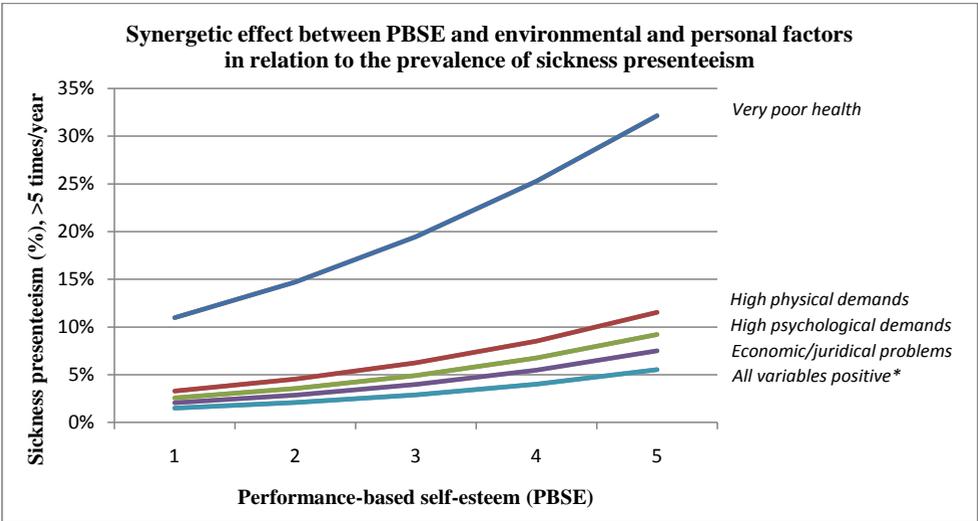
Performance-based self-esteem as a predictor of frequent sickness presenteeism (study IV)

The prevalence of sickness presenteeism on more than five occasions in the last 12 months was 12% ($n = 415$) for the whole study sample. Women had a higher prevalence of sickness presenteeism than did men, 13% ($n = 298$) versus 9% ($n = 117$), respectively. The mean value for the compound PBSE index was 3.74 for the whole study sample, women having a slightly higher mean than did men, i.e., 3.83 versus 3.59, respectively.

Individuals with high performance-based self-esteem (PBSE) were present at work/studies when ill (i.e., sickness presenteeism) more frequently than were others. In the unadjusted analyses, and for the total study sample, the prevalence ratio was 1.5, representing the effect on sickness presenteeism of a one-unit change in PBSE. The unadjusted prevalence of sickness presenteeism ranged from 4% (95% CI: 2.4–5.3) for low PBSE (i.e., PBSE = 1) to 18% (95% CI:

15.8–20.9) for high PBSE (PBSE = 5). Calculating the prevalence ratios for women and men separately gave similar results regarding the effect of PBSE on sickness presenteeism, the prevalence ratio being 1.5 for women and 1.4 for men. In the multivariate analyses, even when adjusting for general health, psychological demands, physical demands, economic or juridical problems, and main occupation, PBSE remained a predictor of sickness presenteeism in the total study sample. The predictive effect of PBSE in relation to sickness presenteeism also remained for both women and men. However, economic and juridical problems had an effect in the final multivariate regression among women but not among men, and there was a statistically significant product term between PBSE and psychological demands in relation to sickness presenteeism among men but not among women (parameter estimates: intercept -4.73 ; PBSE 0.03 ; demands -1.36 ; PBSE*demands 0.57 , $p = .04$).

Based on the intercept and parameter estimates of the multivariate models, the prevalence of different variable combinations was calculated. There was a clear synergy effect between PBSE and the examined variables in relation to sickness presenteeism. When all examined variables were good (i.e., very good health, low physical demands, low psychological demands, and no economic/juridical problems) the absolute effect of PBSE on sickness presenteeism was 4 percentage points (2–6%) when comparing PBSE = 1 with PBSE = 5. However, among those reporting very poor health (and good on all other variables), the absolute effect of PBSE on sickness presenteeism increased by 21 percentage points (11–32%) when comparing PBSE = 1 with PBSE = 5. Although at a lower prevalence, we observed a corresponding increase in absolute effect of 6 percentage points (3–9%) for high psychological demands, 9 percentage points (3–12%) for high physical demands, and 6 percentage points (2–8%) for economic or juridical problems (see Figure 7).



* Good health, low physical demands, low psychological demands, and no economic or juridical problems

Figure 7. Synergetic effect between PBSE and environmental and personal factors in relation to the prevalence of sickness presenteeism

This synergetic pattern was also observed when separately analysing employees and university students (figures not shown). Unfortunately, the other customary occupation groups were too small to provide a stable result. Although these synergetic patterns were observed in separate analyses of women and men, the patterns seemed somewhat stronger among the women. The absolute effect of PBSE on sickness presenteeism among women reporting very poor health increased by 22 percentage points (11–33%) when comparing PBSE = 1 with PBSE = 5, whereas the corresponding increase among men was 15 percentage points (11–26%).

Discussion

The overall aim of this thesis was to contribute to our understanding of contemporary aspects of health and performance among young adult women and men. This aim was based on two fundamental premises. First, because health is strongly related to the interaction between the individual and the environment, societal changes might provide changed living conditions that in turn result in new potential health hazards [27, 236]. Although this might appear elementary, public health has been criticized for being too focused on the individual level, as “individualization itself mitigates against structural policy measures, by making people’s lives their own responsibility” [237]. The second premise concerns how health in later life is not just a result of present conditions but also a consequence of living conditions and health at younger ages (e.g., [152, 154, 155]). Against this background, it is disquieting that the prevalence of mental health symptoms among young people in Sweden has increased considerably over the last two decades. Furthermore, even at a young age, the prevalence of these symptoms seems most pronounced among young women [10, 11]. Moreover, and in contrast to the social gradient of health, worries and anxiety seem to be most prominent among the increasing number of studying young women [14]. Based on this life-course perspective on health and because most young adults actually have a good health status [10], the focus of this thesis was not on studying current disease. Instead, the included studies focused on conditions or behaviours that might result in more pronounced health problems later in adult life.

However, the purpose of this thesis was not to cover all contemporary health-related conditions relevant to young adults. Neither is it possible to declare that the conditions in focus are the most important from a public health or occupational health perspective. The choice of concerns made in this thesis was based on the understanding that societal changes have brought about: a) an increasing number of women studying at university [10], b) an increasing number of women entering educational fields and occupations traditionally dominated by men [10], and c) an increase in the focus on individual performance [11, 28] and the pursuit of self-esteem [50, 51]. Thus, the concerns in focus would likely be of increasing importance to an increasing number of individuals. Although the constituent quantitative studies (**studies I, II, and IV**) did not specifically deal with the overall cultural and structural shift towards individualization, they were not conducted in a vacuum. Hence, the experience of individualization and of the de-standardization of the transition to adulthood has probably somewhat affected the respondents’ responses to the questionnaires. These more comprehensive socio-cultural trajectories of individualization were somewhat touched on in **study III**.

As mentioned above, due to the scope of this thesis, relevant aspects have been ignored. One such intentional oversight is that, although common mental health problems [131], lower self-rated health, and longstanding illness are generally more prevalent among more socially disadvantaged groups [238], these groups were scarcely considered in the present thesis.

The findings of this thesis will be discussed using the same three subdivisions as in the “Results” section: a) “Early inequalities in health and performance”, b) “Conditions related to stress and insufficient recovery”, and, c) “Performance-based self-esteem as a predictor of frequent sickness presenteeism”. After each section, the methodology and limitations of specific studies are considered. Finally, a general discussion will consider the results in a more synthesizing way, followed by a discussion of their practical applications.

Early inequalities in health and performance

In **studies I** and **II**, young women were found to have a lower prevalence of very good health and unimpaired performance than did young men, both at a certain time and as a maintained measure over two years. Women also reported more symptoms and more stable negative conditions, such as high demands and work/home spillover. Although health inequalities in this age group have been previously confirmed [10, 15, 25], the results of the present studies add knowledge to the existing literature. While previous studies have mainly analysed outcomes measured at one time point only, and with a focus on health problems, **study II** demonstrates inequality even in a maintained outcome over two years among individuals with very good health and no performance impairment (i.e., in relation to symptoms). Although the clinical significance of this rather extreme measure is difficult to evaluate, it reflects an attempt to focus on the more positive side of health and functioning. Setting the cut-off at the highest response alternative for self-rated health is supported by a recent review demonstrating that, compared with self-reported “excellent” health, the relative risk of all-cause mortality was 1.23 (1.09–1.39) for those only reporting “good” health [239]. Why single women had lower prevalence of very good health and no performance impairment than married/cohabiting women in **study I** is unclear. One assumption could be that the high-level subjective demands among young women were mediated by relationship to a partner, through support and contextual boundary setting.

The design of **studies I** and **II** also allowed us to examine inequalities extending beyond issues such as occupational segregation and double responsibility for both paid and unpaid work [88, 240, 241], since the study samples were fairly homogenous, being similar in age, task, hierarchical level, socio-economic status [242], and in that very few had children. Finding inequalities in addition to these factors supports previous findings that gender-based differentiation of exposures among young adults goes further than the more obvious structural differentiation [111, 243]. The basis of this reasoning is that exposure to an adverse psychosocial environment may elicit sustained stress reactions with negative long-term consequences for health [95]. For example, sexual harassment, which is more prevalent among women in male-dominated workplaces [244], can result in women believing that they have to over-perform [245]. In these situations, women might also be exposed to more covert discrimination. Although not covered in **study II**, the highly educated young women examined in **study III** described how, for example, being overlooked in discussions or excluded from information provision and networks

awakened a feeling of having to over-perform to compensate for being women (see the discussion of “chilly climate” below). Although the participants in **study III** were working, the chilly climate phenomenon has also been observed among female undergraduate students [243]. Interestingly, **study III** found that even individuals who had not themselves been exposed to these circumstances over-performed due to a fear of such exposure (discussed in detail below). As demonstrated in **study III**, over-performance behaviour might lead to increased sickness presenteeism, which, according to previous findings, might threaten subsequent health [159-161, 174].

Beyond a potential difference in exposures between women and men, the differences found in **studies I** and **II** might also be affected by divergence in coping or vulnerability between women and men. “Dysfunctional coping strategies” have previously been observed among young adult women [90], and a recent qualitative study found that both young women and young men believed that the greater prevalence of stress in women was due to their greater ambition [11]. Based on this reasoning, it can be assumed that the observed inequality in demands and maintained health and performance was due to the women being overly ambitious. Related to the findings of **study IV** is the hypothetical possibility that the women entering educational fields such as computer science and medicine may have a higher performance-based self-esteem than do the men in these programmes; consequently, their excessive striving behaviour might counteract the maintenance of health and performance by hindering sufficient recovery. However, as discussed below, the results of **study III** clearly emphasize that it is not individual driving forces alone that create such a situation. Instead, a synergy between individual ambition and contextual characteristics seems to be the key to stress and insufficient recovery. The importance of contextual factors might find some support in a previous study that observed that, although women and men had the same stress level when starting their medical education, during the course of study, women students reported a greater increase in stress and ill health [246]. The role of a male-dominated environment might be especially pronounced among women in computer science, as the numerical dominance is most obvious in this field. Nevertheless, as more women than men are currently undergoing medical training in Sweden, these forces may not apply equally strongly in medicine. Nevertheless, even if a profession is numerically dominated by one sex, vertical segregation [88] can result in domination by the other sex according to power structures and culture. Differences have been found in the sources of anxiety between women and men, especially in the case of medical students in contact with consultants and clinical practice [247]. A recent study even confirmed that different levels of sexual harassment occurred in different medical specialties during education [248].

That the negative spillover from private life to work/studies was indicated as a more important predictor in women than in men in **study II** could correspond to the findings of previous experimental studies reporting that women became more stressed by having responsibility for children while men were more stressed by more specific performance tasks [249]. Even though almost nobody in the present cohort had children, it could be that young women have a greater focus on caring, even in the absence of children [250], which influences their perceived responsibility for friends, parents, and partners. This perceived responsibility for relationships was in fact illustrated in **study III**. However, in line with the constant interplay between the individual and the environment, it is reasonable to believe that this perceived

responsibility was not just a product of the individual herself but also a response to an actual expectation imposed by the surroundings.

Finally, in light of the limitations of **studies I and II** (see below), the identified inequalities are problematic in various ways. First, they can be seen as the failure of a high-income country to create living conditions that offer equal opportunities for good health and functional capacity (i.e., no performance impairment) to both young adult women and men, a situation that contradicts the basic principle of “fair equal opportunity” of fundamental life chances [251]. Second, the inequalities found at this early stage in life might also predict later inequalities in health and functional capacity between women and men [151-153, 156, 252]. Hence, later inequalities in health, sick leave, and premature retirement might be reduced if inequalities at this young age are dealt with. Concentrating on these inequalities becomes even more important in a situation in which most high-income countries are facing imminent labour shortages due to ageing populations [253].

Methodological considerations (studies I and II)

The results of **studies I and II** should be interpreted in light of the limitations of the study. Although a statistically significant difference in very good health and no performance impairment between women and men was found in **study I**, this difference is difficult to interpret. As mentioned above, any inequalities between groups could be seen as problematic from the perspective of justice [251]. However, it is difficult to rate the clinical significance of the observed inequality. This is partly because the study was cross-sectional (e.g., Would we achieve the same results if measuring at another time point?) and partly because the combined measure of very good health and no performance impairment has not been used previously and associations with future health outcomes are unclear. However, self-rated health has previously shown itself to be a robust predictor of both mortality [135-141, 254] and future morbidity [139, 142]. Moreover, as the two components, i.e., self-rated health and no performance impairment, were closely related, one could question whether these components really supplemented each other or whether they in fact represented just one dimension. Yet, this supplemental function obtained some support from the fact that some individuals reporting very good health also reported impaired performance. With its lack of exclusively positive measures, there is also a risk in **study I** that the combination of very good health and no performance impairment represents simply the reverse side of pathological symptoms. However, the outcome was also closely related to the energy dimension in the stress energy instrument, and a recent study even suggests that at least some factors associated with positive self-rated health differ from factors associated with negative self-rated health [148]. Still, although this combined assessment captures some aspects of positive aspects of health and performance, it is not the “ultimate” instrument for this purpose, and more positive measures, such as psychological well-being [123] and positive affect [121], should be included in future studies with similar aims.

The criteria for classifying individuals in the *maintained health and performance* group in **study II** could be regarded as extreme, in that several of them had to be fulfilled (i.e., very good health and no performance impairment at three time points). Consequently, there might be a risk of misclassification. Hence, individuals who actually *maintained* their health and performance might be misclassified in the group that *gained* health and performance at t_2 and maintained it

until t_3 . Because these individuals were excluded and a higher proportion of women gained the outcome at t_2 and maintained it until t_3 , more women than men might have been misclassified. Consequently, if these individuals have been correctly classified to the maintained health and performance group the difference between women and men might have been reduced. However, this misclassification likely only affects a few individuals and, combined with the finding that women also had more stable negative conditions regarding high demands and spillover from studies to private life, it is reasonable to believe that the detected inequality represents actual circumstances. A further limitation of this extreme classification is that it may be sensitive to daily fluctuations and may therefore be stronger for women because of possible fluctuations in well-being during the menstrual cycle.

Even though the explanatory factors investigated in **study II** covered important health and performance-related fields, such as health-related behaviour, conditions at work/school, and issues of work–home interference, they did not explain the inequality in maintained health and performance between women and men in this sample. This is in line with a recent study that found that demographic, work, and health factors did not explain the sex differences in work-related fatigue between highly educated employees [22]. As instruments commonly used in occupational health research were developed several decades ago in an industrial context, they might fail to capture relevant aspects of contemporary work life [255]. Most theories and instruments for assessing the workplace environment are based on knowledge developed at a time when most workers were men, so they might fail to capture important gender-based circumstances (e.g., a chilly climate) [255, 256]. Moreover, because circumstances in childhood or adolescence may affect health in adulthood [150, 257], we cannot rule out the possibility that the inequalities found in the present study were a result of gender-based health-related factors during adolescence or childhood. Another limitation is that a 90% CI was used among the women whereas a 95% CI was used among the men when examining the relationship between explanatory factors and maintained health and performance. This increases the risk of irrelevant factors becoming statistically significant for women. However, because the women presented many fewer cases than did the men, using a 95% CI would have meant running the risk of ignoring factors of actual relevance. Any one of these procedures ends up as a compromise, so it is important to take account of these limitations when interpreting the results.

The inequalities found in **studies I** and **II** could also have resulted from a gender-based report bias due to potential differences in how symptoms are perceived, evaluated, and acted on [96]. However, although some studies suggest that women might be more inclined to report symptoms, evidence is ambiguous and in some cases even conflicting [100, 102-106] (ref?). However, although empirical evidence of a gendered report bias is conflicting, this possibility cannot be excluded.

Conditions related to stress and insufficient recovery

The results of **study III** generated a conceptual model describing how synergy between enthusiastic and performance-striving young women and a context overflowing with opportunities and demands resulted in the core category, ambiguity overload, which in turn led to stress. Unless this ambiguity was handled by means of individual or contextual boundary setting, it resulted in individuals becoming stuck in a loop of stress and dysfunctional coping behaviour,

which in turn greatly limited their opportunities for sufficient recovery. In light of previous findings, an imbalance between stress and recovery will in the long run jeopardize the maintenance of health and work ability [258]. Although the present results partly overlap traditional stress theories in describing how the relationship between individuals and their environment might result in stress [200, 209, 225], the theory of ambiguity overload provides more specific and detailed knowledge of how young adult women experience the interaction with their living context in terms of stress and recovery, an area previously scarcely covered [114].

The concept of ambiguity overload captures how the cumulative effects of various dimensions of ambiguity generate intense and constant mental activity due to uncertainty, continuous decision-making, and evaluation processes. Hence, the informants' great enthusiasm and striving for performance were constantly triggered and reinforced by the specific characteristics of their living context, a situation that could result in long periods of intense activity with little possibility of recovery. Handling specific contextual characteristics, such as gender-based structures and performance-focused surroundings, seemed to be related to stress in themselves, but this effect was significantly amplified by the combined effect of handling various demanding contextual dimensions at the same time. To achieve a sustainable balance between stress and recovery, boundary setting was crucial. However, **study III** indicates that estimating one's own sustainable level of performance and setting essential individual boundaries can be extremely difficult in this cumbersome context. This situation might result in individuals pushing themselves too hard and, in line with **study IV**, several respondents reported that they often went to work despite being ill enough to warrant staying at home to recuperate. Nevertheless, and in line with the experience of informants, who felt completely responsible for their own stress levels, responsibility for work-related health has increasingly been shifted from employers to the individual employees, who are now expected to set their own limits in relation to work [37]. This shift might relate to societal individualization [28] and to the fact that both work exposures (e.g., boundaryless work) [35] and work-related health outcomes (e.g., stress-related symptoms and disease) are more vague and indefinite in present-day workplaces than in previous industrial settings. However, because this is a developmental trend, many current industries are still far from being boundaryless (e.g., [259]). In line with the results of **study III**, a recent study examines how highly educated women on sick leave interpret their situation from an individualistic, psychological perspective. Consequently, their reintegration into the workplace fails because, as the women relied solely on individual strategies, the organizational culture failed to change [21]. These empirical results are also in line with Schwartz's theoretical reasoning that the culture of individualism biases individuals towards making causal attributions that focus on internal rather than external factors [33].

Although representing a privileged group in society, highly educated women have been the subject of studies emphasizing their health problems [20, 21, 236, 260]. In Sweden, the increase in self-reported worries and anxiety has been especially pronounced among young studying women [14]. Some studies have also indicated that work characteristics such as high demands and high control (i.e., characteristic of active jobs), often found to be protective among men, are related to increased risk of health problems among women [236, 261-263]. Lidwall and Marklund (2006) suggest, based on the work of Moss Kanter [113], that as women enter new occupational careers previously dominated by men, their minority situation creates a feeling of loneliness and exposure and exposes them to discrimination [263]. It is possible that this situation

is closely related to societal context and that the Swedish labour market and educational system have resulted in a situation hardly comparable to those of other nations. Still, one example of a similar situation could be the Netherlands [21, 22].

In line with previous research [236], the results of **study II** suggest that it is particularly important that managers help their co-workers set boundaries, to allow for sufficient recovery. However, managers themselves are often overloaded with work, and consequently are hindered in supporting their co-workers, so a focus on boundary setting must start at higher organizational levels [264]. Unfortunately, this might be difficult in more extreme work environments, as indicated in **study III**, as attitudes rewarding workaholism seemed to emerge from high organizational levels. Further research is needed into how individual and contextual boundary setting should be designed, so as best to support highly educated young women balance stress and recovery. Although the patterns identified here were consistent throughout the interviews, some informants seemed to have more extreme ambitions and some contexts seemed more extreme. Consequently, some individuals might render themselves especially vulnerable by constantly pushing themselves too hard and some contexts might be especially hazardous or difficult to cope with. A related study found that highly educated women on sick leave had developed their mental health problems from working overtime because of workaholism or to meet supervisor expectations [21]. That some individuals might push themselves particularly hard found support in **study IV**. As the conditions highlighted in **study III** seemed to increase individual performance ambition, it is possible that living under these circumstances for a long period, especially in one's younger years, could increase performance-based self-esteem. Although traits are generally considered stable, birth cohort comparisons have revealed substantial personality changes among young people [46]. Like the individuals with high PBSE examined in **study IV**, the informants in **study III** often continued at the same high pace even though their bodies were signalling the need for respite by means of various physical and mental symptoms. As discussed in **study IV**, it has been demonstrated that pushing oneself too hard through working when ill predicts future long-term sick leave [159, 161] and that ignoring stress symptoms and body signals is the first step in a process towards exhaustion [265]. Even procrastination (i.e., postponing health issues) has previously been associated with future health problems [266].

The synergy between individual and contextual factors found in **study III** was also observed in **study IV**. Future research is needed into the relationship between individual characteristics, certain conditions, and hazardous health behaviour. That one contextual dimension concerned gender-based structures suggests that highly educated young women must deal with a reality somewhat different from that experienced by highly educated young men. This is in line with a previous findings that exposure to various stress stimuli related to the minority status of women in male-dominated occupations entailed increased visibility, performance pressure, and harassment [112]. Likewise, another study observed an interaction between pronounced overcommitment and male domination in relation to myocardial infarction among women [80]. The findings of **study III** illustrate how the informants over-performed to compensate for being women, which in turn had consequences for the total amount of stress experienced and the balance between stress and recovery. As mentioned above, explicit belittlement from colleagues and clients has previously been related to over-performance [245], and experiences of being less listened to and excluded from informal information and decision networks closely relate to the "chilly climate" concept [267]. Interestingly, in **study III** even

informants who had not themselves experienced discrimination over-performed by making additional preparation and trying to act more professionally when working with men. That starting a family would adversely affect one's career development has been indicated in previous research [268] and was one reason why informants put their thoughts of having children "on hold". Unfortunately, this stance then became a stressor in itself, magnifying the "biological clock" as a stressor. Thoughts of combining family and career were also discouraged by a culture having workaholicism as its ideal. This ideal has previously been identified as hindering women's career development in male-dominated work environments [269]. Moreover, that women often have a greater total workload than do men [83] only exacerbates this situation. Based on the described situations and the finding of **study III** that women had to compensate for being women, it is plausible that women might often experience a higher prevalence of role conflict that might in turn act as a stress stimulus. That the negative spillover from work to private life was especially pronounced among the women examined in **study II** might point in this direction. That too many roles might lead to role conflict or role overload is in line with role stress theory [206]; however, the results of **study III** also emphasize the positive experience of having many roles, in line with the role expansion theory [270]. Although these two theories have been presented as contradictory [270], the results of **study III** suggest a more complex relationship.

Prior studies have proposed that tailoring human resource policies [271] and equalizing caring responsibilities between women and men [272] would help achieve significant progress in these matters. Based on the results of **study III**, it is of course impossible to comment on potential gender-based demands and conditions facing young men (e.g., masculinity-related stressors and hazardous health behaviour), but that women working in male-dominated work environments might experience gender-specific exposures corresponds to previous findings [80, 111, 112].

Methodological considerations (study III)

Even though stress levels varied among the informants, the same theoretical pattern relating to the core category applied to all of them. When we explained and discussed the theory of ambiguity overload with other scholars, they approved the theory's workability and relevance. We acknowledge that qualitative studies emerge from interaction between the participants and the involved researchers [231] and recognize that the chosen study context might increase the risk of preconceptions infiltrating the process [234]. Therefore, the analytical process focused on accurate and constant comparisons combined with keeping the initial codes very close to the data. It has been stated that generalizability must also be an issue for qualitative research [273]. In this regard, we argue that the empirically grounded theory of ambiguity overload highlights basic psychosocial processes occurring when extensively ambitious individuals face a context overflowing with opportunities and demands. Accordingly, this theory could be transferred to comparable settings that, according to the literature, are increasingly common in modern western societies, for example, individualization, performance-focused environments, and boundaryless work. Moreover, the fact that the interviewer was a man and all interviewees were women might also have affected the outcome of **study III**, though it is difficult to say in what direction.

Performance-based self-esteem as a predictor of frequent sickness presenteeism

In **study IV**, PBSE was found to be a predictor of frequent sickness presenteeism (>5 times/year) in the total study sample. The association remained even after adjusting for several previously observed predictors of sickness presenteeism, such as health, psychological demands [175, 177], economic problems [177], main occupation, and physical demands. Although PBSE differs from “individual boundarylessness” [177], both characteristics seem to impede individuals from paying attention to their own needs, i.e., allowing adequate recovery time. From a public health perspective, such striving behaviour could become an increasing problem due to an increase in the individual pursuit of self-esteem [50, 51]. Moreover, as work is becoming more flexible and boundaryless [35] and responsibility for work-related health is gradually shifting from the employer to individual employees, who must set their limits in relation to work [35, 37], the possibility of pushing oneself too hard might have increased. It is also possible that PBSE-related over-performance behaviour at work/educational activities (e.g., sickness presenteeism) is accompanied by a more general tendency to ignore bodily signs of health problems [162]. Although the level of PBSE in the participants in **study III** was unknown, there were clear signs that they ignored symptoms and postponed health. As the present study sample included only young adults, generalizations to other age groups should be made with caution, especially as students were included in the analyses. However, because the same pattern was found among both employed and students in the stratified analyses, it seems that over-performance manifests itself even before permanent working life has begun. Thus, the recognition that PBSE results in a potentially hazardous behaviour at such an early age is alarming, as insufficient recuperation may result in direct negative health effects but also add up as a cumulative burden leading to more serious health outcomes later in life.

The second research question posed in **study IV** concerned whether the relationship between PBSE and sickness presenteeism interacted with environmental and personal factors. Such an interaction was indeed indicated. The prevalence of frequent sickness presenteeism greatly increased among individuals facing poor health, high psychological demands, high physiological demands, or economic/juridical problems if their self-esteem was also highly dependent on their performance. This synergetic mechanism was also illustrated in **study III**. A future research challenge will be to identify what environmental and personal factors are most difficult to handle for individuals with highly contingent self-esteem.

Methodological considerations (study IV)

As it is self-assessed, the sickness presenteeism measure cannot be completely free of potential response bias. The wording “... should have taken sick leave ...” is problematic, as it includes a subjective appraisal, i.e., “should”. When suffering from a particular health problem, one’s work ability could range from adequate to severely substandard depending on the job in question. It is also possible that individuals with high PBSE might appraise “should” somewhat differently from individuals with low PBSE. In the present study, such a bias could have resulted in the relationship between PBSE and sickness presenteeism being underestimated, as participants with high PBSE might think that they “should” perform at a higher level, and consequently underreport sickness presenteeism. On the other hand, it is also plausible that individuals with

high PBSE might over-report sickness presenteeism, as going to work when ill could be seen as an achievement in itself. Knowledge of how individuals with high PBSE reason about and answer this question should be enhanced by qualitative studies in the response psychology tradition. It is also important to note that the present findings were based on a rather high threshold of sickness presenteeism, i.e., more than five times per year. If a lower threshold had been used, the prevalence would have been even higher. Moreover, that sickness presenteeism was dichotomized in this study as more than five times/year versus 0–5 times/year, probably led to underestimation of the relationship with PBSE.

That the applied PBSE index used only two of the original four items could be a limitation, as this probably reduces the reliability of the measure. However, as the choice of these two items was based on a test–retest examination [213] and on considerations of specificity and sensitivity, it was estimated that the two-item index would work satisfactorily in group-level studies.

Compared with others, individuals with high PBSE might be biased in how they report demands. However, the direction of such a bias could go either way with contrarian implications for effects on the interpretation of the results. An over-reporting of demands among PBSE individuals would, for example, result in overestimating the observed synergy. However, it is equally likely that these individuals would under-report demands to increase their own ability (i.e., these demands are no problem for me).

The response rate at baseline was very low (36%). Dropout analyses revealed that the study sample did not differ markedly from the national population except that individuals whose parents were born outside Sweden were underrepresented. However, factors important for the observed relationships may still have differed between our study sample and the general population. Young adults are a difficult group to study using questionnaires, and further studies of this group should attempt to find new ways to increase the response rate and sample size.

Finally, although several likely confounders were included in the present study, including still other confounding variables might have affected the results.

Concluding discussion

The results of this thesis indicated the existence of inequalities in health and performance between women and men in higher education (**studies I and II**), conditions related to stress and insufficient recovery among highly educated young women (**study III**), and performance-based self-esteem (PBSE) as a predictor of frequent sickness presenteeism (**study IV**). Although the included studies did not identify current disease, based on life-course epidemiology it is plausible that the recognized conditions might eventually lead to disease, decreased well-being, and decreased work ability later in adult life, especially considering the developmental vulnerability of individuals in this period of life [16] (e.g., development of health-related behaviours and self-esteem). Moreover, even though this supposed progress would only affect a limited proportion of the individuals in question, the cluster to which they belong is expanding (e.g., women in higher education and highly educated women in occupations traditionally dominated by men). Therefore, the effect on society might still become substantial.

The last two decades has seen a notable increase in the number of young women studying at university. Consequently, today there are an increasing number of young highly educated women who have just begun their occupational careers and have not yet faced having to combine a career with family life and the main responsibility for unpaid work at home. As many women are also entering occupational fields traditionally dominated by men, the results of this thesis suggest that, despite occupying the same formal positions, they might face different and more burdensome circumstances than those of their colleagues that are men. It is also possible that some of these occupational areas harbour a culture of workaholism building on a former labour market paradigm that assumes that one person (i.e., the wife) is not engaged in paid work but does all the work at home [274]. Hence, this contemporary situation might mean that the combination of particularly burdensome circumstances at work plus a greater responsibility for domestic work results in the accumulation of disadvantages [155] for women in relation to men. Moreover, the ethic of individual achievement seems to have increased [31], and this development might be particularly pronounced among young people [7, 11]. The individualization of society has also meant that individuals must take greater responsibility for their health and health-related behaviour [37, 158]. Nonetheless, having an all-embracing focus on alleviating ill health through individual intervention ignores that social organization is the most important determinant of health [275]. This reasoning might be especially true among young adults, as their living conditions have changed considerably from those experienced by earlier generations. Also, young adults with high PBSE might be especially vulnerable to a situation in which individual achievement is emphasized at the same time as health is increasingly seen as an exclusively individual responsibility.

Practical implications

In accordance with the results of this thesis, there seems to be a need for an increased focus on boundary setting to maintain health and work ability in adult life, at both the individual and contextual levels. As many young adults might face living conditions similar to those presented in **study III** (i.e., overflowing with perceived opportunities and demands), individuals increasingly must set their own limits if they are to attain sufficient recovery. As these living conditions are new compared with those of previous generations, there might also be few clear references and pre-existing ways of handling these situations. Hence, young individuals should be better trained at school to estimate their physical and mental limitations, and to develop tools for setting necessary boundaries, not only in relation to demands but also in relation to an overload of perceived opportunities. Nevertheless, the results of this thesis clearly emphasize the difficulties individuals might have in setting such boundaries in these cumbersome contexts. Therefore, a focus on improved individual coping resources must be complemented by an enhanced focus on contextual boundaries in which organizations, managers, teachers, and supervisors should 1) foster a climate in which workaholism is not rewarded, 2) monitor employees who manifest exaggerated striving behaviour, and 3) support employees in setting limits that allow for sufficient recovery. Moreover, as this thesis indicated that highly educated young women might face work/study conditions differing from those experienced by men, political and corporate decision makers must also identify and eliminate gender-based structures and attitudes that might

increase the amount of stress by young women. This is crucial, as it is an explicit political and corporate objective to increase the proportion of women in higher positions. Obstacles erected by discrimination could force women to change career direction in order to preserve their health or to permit a healthy combination of work and family.

Conclusions

General conclusions

The constituent studies have made several contributions to our understanding of contemporary aspects of health and performance. First, early inequalities in health and performance between young women and men existed even in study samples that were fairly homogenous in terms of age, occupational task, hierarchical level, socio-economic status, and number of children. Second, the synergy between highly ambitious individuals and an environment overflowing with opportunities and demands was qualitatively related to ambiguity overload, which led to stress and insufficient recovery among highly educated young women in non-traditional women's occupations. Third, a personality in which self-esteem is dependent on performance was a predictor of potentially hazardous behaviour in the form of frequent sickness presenteeism.

Early inequalities in health and performance

- Young adult women had a lower prevalence of very good health and no performance impairment than did young men in a fairly homogenous study sample (**study I**).
- Young women also reported a higher prevalence than did young men of too high demands; that these demands often affected their private lives, high stress-high energy pattern, prolonged stress, worsened mood, worry, palpitations, and sleeping disorders. Even skin symptoms, eye symptoms, and musculoskeletal pain (i.e., back, neck, and shoulder pain) were more common among the women than among the men (**study I**).
- Women had a lower prevalence than did men of maintained health and performance over two years, in a fairly homogenous study sample (**study II**).
- The predictors of maintained health and performance followed the same pattern for men and women.
- The studied explanatory factors did not explain the observed inequality (**study II**).

Conditions related to stress and insufficient recovery

- A synergy between extensively ambitious highly educated young women and a context overflowing with opportunities and demands resulted in ambiguity overload, which in turn led to stress. If this overload was not handled via individual or contextual boundary setting, the informants became stuck in a loop of stress and dysfunctional coping behaviour, threatening the balance between stress and sufficient recovery (**study III**).

Performance-based self-esteem as a predictor of frequent sickness presenteeism

- Individuals with high performance-based self-esteem (PBSE) attended work/educational activities when ill more frequently than did others. PBSE remained a predictor of sickness presenteeism even when adjusting for general health, psychological demands, physiological demands, economic or juridical problems, and main occupation (**study IV**).
- A synergy effect was also observed in which the absolute effect of PBSE on sickness presenteeism increased by 21 percentage units when comparing low and high PBSE, among those reporting very poor health. A corresponding increase in absolute effect, although at a lower prevalence, was also observed for high psychological demands, high physical demands, and economic or juridical problems (**study IV**).

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