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Research Article

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From Intense to Leisurely Study Days: A Diary Study of Daily Wellbeing among Students in Higher Education

Abstract: This mobile diary study examined day-to-day variability during one study week among university students and study-related associated factors promoting and impairing their well-being. Specifically, we explored (1) what factors university students consider as promoting and as impairing their daily wellbeing, (2) what types of daily study profiles for students can be identified based on study hours, study motivation, and academic stress, and (3) how the factors promoting and impairing students' daily wellbeing are related to these daily study profiles. The study utilized one-week mobile diary data collected from 86 university students studying in a Finnish university (a total of 602 measurements). Seven factors promoting and eight factors impairing the wellbeing of students were identified. These included leisure time and domestic duties, social relations, sleep, rest, nutrition, and time management. Using multilevel latent profile analysis, we further identified four distinct daily study profiles: intense, productive, inefficient, and leisurely study days. The results also showed that the various factors promoting and impairing daily wellbeing were differently associated with the four study profiles.

Keywords: academic stress; mobile diary study; university student; wellbeing.

1 Introduction

In universities and colleges, it has been found that students who fare well and have good mental health are also successful in their studies (e.g., Ayyash-Abdo & Sánches-Ruiz, 2012; Pritchard & Wilson, 2003) whereas those with problems in wellbeing have also shown lower academic functioning (e.g., Bruffaerts et al., 2018; Eisenberg, Golberstein, & Hunt, 2009; Stallman, 2010). This study focused on the daily wellbeing of university students defined through the concept of subjective wellbeing, which includes their evaluations on their overall quality of life (Diener, Oishi, & Lucas, 2005). These evaluations thus cover different life dimensions (see Diener, 1984; Keyes, 2006), including the psychological, social, and physical. In view of that, the range of evaluations include emotional reactions as well as cognitive judgements of satisfaction (Diener et al., 2005).

In Finland, the results of the University Student Health Survey (Kunttu, Pesonen, & Saari, 2016) show that only 66 per cent of university students rate their mental wellbeing as being good or very good. Students commonly experience mental health problems, including continuous overstrain, difficulties in concentrating on the task at hand, feelings of unhappiness and depression, and loss of sleep because of worries (Kunttu et al., 2016). Given the high prevalence of these problems in the mental health and daily coping of university students in Finland (Kunttu et al., 2016) and elsewhere (e.g., Benton, Robertson, Tseng, Newton, & Benton, 2003; Robotham & Julian, 2006; Stallman, 2010; Storrie, Ahern, & Tuckett, 2010), this study sought to identify not only the factors that impair but also those that promote students' wellbeing.

Research increasingly indicates that not all days in the week are similar in terms of students' wellbeing (e.g., Burns & Ma, 2015; Reis, Sheldon, Gable, Roscoe, & Ryan, 2000). Debate is ongoing on the temporal nature of subjective wellbeing and on whether it changes or is a stable trait over time and across situations (see Strack, Argyle, & Schwarz, 2007). Some studies have found that study weeks are not stable; instead, they exhibit daily variation in the time students spend on studying (Greene & Maggs, 2015), study motivation (Dörnyei, 2000) and academic stress (Moilanen, Lindroos, Tolvanen, Sevón, Autio, &

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Rönkä, 2020). While such differences between students are indisputable, they are often explained by differences between individuals. We would argue, however, that day-to-day variation may also exist within individuals. This possibility has been little investigated, especially from the perspective of student wellbeing. Hence, in this study, we aimed to identify daily study profiles among university students studying in a Finnish university, focusing on study hours, motivation, and stress, and to examine the associations of these profiles on factors promoting and impairing students' daily wellbeing.

We approached the task of identifying students' wellbeing and study profiles by means of mobile diary data gathered over one week, the aim being to reveal novel factors that contribute to a good and a poor day from the perspective of students' wellbeing and whether different study days are associated with different aspects of wellbeing. While diary methods have been utilized to investigate students' specific health behaviors or experiences, such as their eating (e.g., Comrie, Masson, & McNeill, 2009) and sleeping habits (e.g., Kawada, 2008), physical activity (e.g., Maher et al., 2013), alcohol consumption (e.g., Craigs, Bewick, Gill, O'May, & Radley, 2011), affects (Reis et al. 2000) and stress experiences (Moilanen et al., 2020; Travers, 2011), they have rarely, to the best of our knowledge, been used to investigate overall wellbeing. While mobile diary methods have been used in a handful of studies on the wellbeing of higher education students, the focus has been on students' daily emotions in different academic situations (e.g., Ketonen et al., 2019; Ketonen, Dietrich, Moeller, Salmela-Aro, & Lonka, 2018). In the present study, however, students' daily wellbeing was approached through a broader concept of subjective wellbeing that includes evaluations about the quality of one's life as a whole (Diener et al., 2005). Based on daily diary reports, this study aimed to analyze the factors that promote or impair students' subjective wellbeing over the course of an academic week and, at the same time, explore how these evaluations are associated with the study days that differ in study hours, and levels of motivation and academic stress.

2 Factors promoting and impairing students' wellbeing

Strong evidence has been presented on the importance of basic daily routines such as sleep, nutrition, and exercise on students' overall wellbeing. Regarding *sleep*, studies show that poor sleeping habits are related to lower mental health, such as higher levels of anxiety (Norbury & Evans, 2019) and stress (Galambos, Dalton, & Maggs, 2009; Lund, Reider, Whiting, & Prichard, 2010), lower academic performance, such as decreased time spent on studying (Galambos et al., 2009), and increased likelihood to skip classes (Lund et al., 2010). *Eating habits* are also associated with students' wellbeing in various ways. For instance, female students, in particular, tend to have an unhealthier diet when under stress (Mikolajczyk, El Ansari, & Maxwell, 2009). Healthy eating habits, again, have been shown to reduce levels of perceived stress and depressive symptoms (El Ansari, Adetunji, & Oskrochi, 2014). Compared with less active students, those engaging in a higher amount of physical activity have, for example, higher levels of vitality (Molina-García, Castillo, & Queralt, 2011) and lower levels of tension and fatigue (Bray & Born, 2004). Physical exercise is also an effective way to cope with stress (Giacobbi Jr., Tuccitto, & Frye, 2007).

Along with physical exercise, students can engage in various other *leisure time activities* (e.g., clubs, organizations, arts, cognitive activities, volunteering, and domestic duties) outside of studies. Through leisure activities, students build their social relationship networks, acquire new skills, and develop positive emotions, all of which promote life quality (Brajša-Žganec, Merkaš, & Šverko, 2011). Also Zhang and Zheng (2017) highlighted the importance of leisure activities in promoting daily wellbeing among Chinese university students, as they discovered a positive association between engagement in students' leisure activities and positive emotion. Furthermore, irrespective of the nature of the activity, the level of satisfaction with their leisure time experienced by higher education students is of crucial importance. Leisure satisfaction appears to promote students' mental wellbeing by decreasing their levels of stress and loneliness and increasing their self-esteem, potentially leading to improvement in their study life (Kim, Sung, Park, & Dittmore, 2015). However, to effectively combine studying with activities and possible duties outside academic life, students in higher education need to have effective *time management skills*. Students themselves have evaluated such skills as a significant factor in their academic success (Stelnicki, Nordstokke, & Saklofske, 2015). Kearns and Gardiner (2007), for example, found that among university population, including students, those who performed more time management behaviors reported lower levels of distress and considered themselves to be more effective in promoting their studies.

Evidence has accumulated on the vital role of social factors, such as *social relations* and *social support*, in the wellbeing of higher education students. Friends provide both direct emotional support and buffering support in stressful situations in university life, and therefore making friends in university is essential for advancing one's studies (Wilcox, Winn, & Fyvie-Gauld, 2005). Along with friends, students' families provide them with fundamental support. In their small-scale study of Malaysian students Awang, Kutty, and Ahmad (2014) found that students whose parents are involved in their educational process have more positive attitudes and behaviors, stronger motivation, and greater participation in university life than those from uninvolved families. Furthermore, social support renders students less vulnerable to stress (Chao, 2012; Stallman, 2010; Vungkhanching, Tonsing, & Tonsing, 2017), while receiving support is associated with better academic success, at least among college freshmen (DeBerard, Spielmans, & Julka, 2004). Finally, social support plays a significant role in satisfying the autonomy, relatedness, and competence needs of students (Basson & Rothmann, 2018), all of which are essential elements of both study motivation and overall wellbeing.

Some studies with samples of students at different phases of their studies have reported time-based variation in the occurrence of the factors promoting and impairing students' wellbeing. Such variation is especially visible between weekends and weekdays. Students' sleep quantity and quality, for instance, appear to be better on Fridays and Saturdays (Galambos et al., 2009; Tsui & Wing, 2009), while their eating habits may be more irregular and unhealthier at weekends than on weekdays (Carpenter Childers, Haley, & Jahns, 2011). Findings on the variation in students' activity levels are more conflicting, showing both higher (Shores & West, 2014) and lower levels of activity (Sigmundová, Chmelík, Sigmund, Feltlová, & Frömel, 2013) at weekends than on weekdays. Variation has also been reported in the quantity of time students spend on leisure activities on different days. For example, hanging out with others seems to be more common at weekends than on weekdays (Reis et al., 2000; Shores & West, 2014). In addition, time compensation is common, meaning that if there is no time for leisure activities on a particular day, students tend to engage in them more on some other day (Greene & Maggs, 2005). Variation in the time spent on certain activities also relates to students' wellbeing; for example, participating in social activities or volunteering more than usual seems to increase students' psychological wellbeing (Doerksen, Elavsky, Rebar, & Conroy, 2014).

3 Study hours, motivation, and stress

Alongside factors promoting and impairing students' wellbeing, we focused on clarifying whether the study days of students studying at a Finnish university vary in accordance with specific study-related factors, namely the number of hours spent studying, study motivation, and academic stress. A link between these has been found among university students: students who are highly motivated to study may experience a high number of study hours as less stressful than less motivated students (Kember & Leung, 2006). Therefore, we examined what types of daily study profiles based on these three factors can be identified among university students and how they are associated with students' wellbeing.

The variable *study hours* comprises all the time spent studying on and off campus, and thus includes lectures, demonstration classes, examinations, group work, and independent studying, which together account for a large part of the daily life of higher education students. While teaching and lectures at Finnish universities are usually offered on weekdays, from Monday to Friday, students may also need to study during weekends. According to the University Student Health Survey (Kunttu et al., 2016), Finnish university students spend an average of 12 hours per week on supervised studies and 16 hours per week on independent studies, and thus study for a total of 28 hours per week, or 4 hours per day, including weekends. Older students tend to study fewer hours but spend more time in paid employment than younger students (Kunttu et al., 2016). However, the overall number of hours spent studying varies, as students in higher education have been found to trade study time for paid work time, especially on weekdays, and to compensate for lost study time by studying for longer hours on other days (Greene & Maggs, 2015).

To understand university students' *study motivation*, we drew on the self-determination theory developed by Deci and Ryan (2000) which divides motivation into intrinsic motivation, extrinsic motivation and amotivation based on individuals' innate needs and drive and their interaction with external pressures. In the context of study life, intrinsic motivation refers to a drive arising from personal needs and satisfaction, for example, from an interest in the subject matter or a desire to increase mastery (Deci & Ryan, 2000). Extrinsic motivation is based on a drive arising from environmental factors or a sense of obligation (Deci & Ryan, 2000) such as grades and praise. In contrast, amotivation refers to the absence of drive (Deci & Ryan, 2000), such as in the case of an assignment perceived as of little value for one's learning. Intrinsic motivation is associated

with various positive outcomes, such as deep learning (Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004), high effort (Pierro, Kruglanski, & Higgins, 2006), higher grades (Lin, McKeachie, & Kim, 2003) and lower levels of stress (Baker, 2004). Study motivation does not remain constant throughout the lengthy process of mastering one's studies but varies with change in the mental processes related to studying, even within the duration of a single course or a study day (Dörnyei, 2000). For this reason, we explored the study motivation of university students at the situational rather than domain level, as this better takes into account the situational and temporal variation in motivation (see Vansteenkiste, Soenens, Sierens, Luyckx, & Lens, 2009). According to the self-determination theory, students' motivation as well as wellbeing are fostered when three basic psychological needs are satisfied: autonomy (desire to act as a causal agent of one's own life), competence (one's control over the outcome and experience of mastery), and relatedness (one's will to be connected to others) (Deci & Ryan, 2000). The degree to which these psychological needs are satisfied is also associated with the daily variation in students' subjective wellbeing (Reis et al., 2000).

Stress is an outcome of the perception that one lacks the resources to cope with a specific situation (Lazarus & Folkman, 1984). Stress among university students can result from the demands of private life as well as academic demands, and hence this study focuses on the latter, that is, on *academic stress* in the Finnish context. Research indicates that university students experience more stress than many other people (Stallman, 2010), that worldwide the levels of stress reported by students in higher education have been constantly rising (e.g., Kunttu et al., 2016; Robotham & Julian, 2006) and that academic stress is the form of stress most commonly experienced by university students (Edjah, Ankomah, Domey, & Laryea, 2020). The results of the University Student Health Survey (Kunttu et al., 2016) showed that 33 per cent of university students in Finland experience considerable stress. University students face a number of common study-related demands, such as taking examinations and completing assignments, meeting grade requirements, coping with the high volume and complexity of their learning material, and effectively managing their time all of which are potential causes of stress. In fact, Finnish students evaluated stress as the most common health problem complicating their studies (Saarenmaa, Saari, & Virtanen, 2010). The most frequent causes of stress that they reported were performing in public and the feeling of not being fully engaged in or not getting a grip on their studies. They also often mentioned negative perceptions concerning their mood, future plans,

resources, and abilities (Kunttu et al., 2016). Academic stress is also associated with other wellbeing-related problems, such as increased depressive symptoms (Barker, Howard, Villemaire-Krajden, & Galambos, 2018; Park et al., 2012), negative emotions (Zhang & Zheng, 2017), and study burnout (Salmela-Aro, 2009). However, not all academic stress is negative; moderate levels of academic stress may also be a motivator in striving for one's goals (Litmanen, 2015), such as completing a course or mastering one's field of study.

4 Objectives

This study aims to investigate subjective evaluations of daily wellbeing among students studying at a Finnish university by analyzing the factors that students consider as promoting and as impairing their daily wellbeing. In addition, we sought to identify different daily study profiles in terms of study hours, stress, and motivation, and examine the associations of these profiles with factors promoting and impairing daily wellbeing. The specific research questions guiding our analyses were:

1. What factors do university students report as promoting and impairing their daily wellbeing?
2. What types of daily study profiles of university students can be identified based on study hours, study motivation, and academic stress?
3. How are these daily study profiles associated with the factors that students perceive as promoting and impairing their daily wellbeing?

5 Method

5.1 Study participants and the Finnish context

The present data were collected in November 2014, when 86 university students completed mobile diaries once a day over a one-week period. Thus, the data comprise observations from 602 days in total (86 students × 7 days). Half of the voluntary participants were students enrolled in a master's degree program in educational sciences who were attending a methods course at a Finnish university. Each student then recruited another master's student for the study; information on these other students' master's programs was not gathered. The majority of the participants were women (84.9%). Participants ranged in age from 19 to 51 years (*M* = 28.8, *SD* = 7.8), 38.4 per cent were single, 29.1 per cent reported being in a

relationship without children, and 25.6 per cent reported having children. Satisfaction with financial situation was assessed as slightly above the mean (M = 4.0, SD = 1.4). Slightly more than one-third (36.0%) reported being in paid employment in addition to their university studies. At the time of the data collection, the participants had been engaged in their university studies for an average of 6.8 years (SD = 1.9, *range*: 4–12 years). Most were Finnish-speaking (87.2%) and the remainder (12.8%) international students who responded to the diary questions in English.

In Finland, students enter university after concluding their upper secondary education. Completing a master's degree at a Finnish university takes about five to six years, including a bachelor's degree which takes about three years. On average, university studies leading to both a bachelor and master's degree start at the age of 22 years (Potila, Moisio, Ahti-Miettinen, Pyy-Martikainen, & Virtanen, 2017). In 2018, women accounted for 54 per cent of all students studying for a university degree (Official Statistics of Finland, 2018). In 2017, 56 per cent of university students had a paid job in addition to their university studies (Official Statistics of Finland, 2017).

5.2 Procedure

Participants were requested to individually complete a mobile diary once a day over a period of seven successive days, Monday through Sunday. Before the diary data collection, the students completed a questionnaire, which included some basic background questions (e.g., age, gender). Prior to the study week, the students were also given detailed instructions on the response procedure. Accordingly, each day, at 6 p.m., the students received text messages in the form of questions to which they sent responses on their mobile phones. Students received one question at a time, and after answering they received the next question and so forth, until all the questions were answered. The diary questions related to the students' university studies and wellbeing and included both structured questions (e.g., on study hours, academic stress) and open-ended questions on their daily wellbeing.

5.3 Measures

5.3.1 Background information

The background questionnaire contained questions on gender (0 = "woman," 1 = "man"), the respondent's age (in years) and the year of university entry. Three dummy-

coded variables indicated the students' family form ("single;" "in a relationship;" "family with children"). Language was coded as a dummy variable (0 = "Finnish," 1 = "English"). The students were further asked to assess their satisfaction with their current financial situation on a scale ranging from 1 (*not at all satisfied*) to 7 (*very satisfied*). Finally, a dummy-coded variable indicated those who were and were not working alongside studying (0 = "no," 1 = "yes").

5.3.2 Factors promoting and impairing daily wellbeing

Each day, the students were asked to describe in their own words what factors they considered had affected their wellbeing that day. The open-ended question was: "What things have promoted or impaired your wellbeing today?"

5.3.3 Study hours, study motivation, and academic stress

In addition to open-ended questions, the diary included structured questions each day on study hours, study motivation, and perceived academic stress. First, the students were asked to indicate, how many hours they had studied on the day in question. Second, they were asked to evaluate their study motivation that day on a scale from 1 (*not at all motivated*) to 7 (*extremely motivated*). Finally, the students were asked to assess their experience of stress related to their studies that day on a scale from 1 (*not at all*) to 7 (*very much*).

5.4 Data analysis

5.4.1 Categorization and dichotomization of factors promoting and impairing daily wellbeing

To address the first research question, the qualitative entries describing the factors that promoted and impaired the daily wellbeing of the students were quantified by coding them into different categories. The entries usually included more than one factor (e.g., "Exercise and family promoted my wellbeing today" [id18, Sunday]). These factors are referred to here as units. The units were then coded into separate categories (see Table 2). Preliminary categories were first inductively created by students who were tasked with analyzing the data as part of their theses. After the formation of categories, dichotomous variables were created for each category (0 = "did not mention the factor," 1 = "mentioned the factor").

The codes were subsequently cross-checked by the first author, who randomly selected 30 per cent of the entries ($n = 149$) and re-coded the units of these entries into the existing categories. The inter-rater reliability of the two coding procedures were evaluated by calculating Cohen's kappa values, which measure the degree of agreement in nominal scales between two independent raters (Cohen, 1960). In each category, agreement was determined by the similarities between the two raters in their distribution of units into the two possible classes for each category (i.e., 0 = "did not mention the factor," 1 = "mentioned the factor"). The kappa values were then calculated separately for each category, and these values ranged from 0.83 to 1.00, indicating almost perfect agreement between the raters (Cohen, 1960.) Finally, some clear inaccuracies in the coding (e.g., if a factor promoting wellbeing had accidentally been coded as a factor impairing wellbeing) were corrected to add to the validity of the codes.

5.4.2 Statistical analysis

The descriptive statistics were generated with IBM SPSS Statistics (version 24). Regression analysis for descriptive purposes (i.e., the associations of the background variables with study hours, motivation, and stress) and latent profile analysis were performed using Mplus (version 8.0) (Muthén & Muthén, 1998–2017). All data were assumed to be missing at random, and thus models were estimated using full information maximum likelihood, which enables the use of all available information without imputing missing values.

The diary data were analyzed using multilevel modeling, which is a useful method for modeling longitudinal data collected at more than one level (Luke, 2004). The values of the ICCs (i.e., intra-class correlations) for the three variables (i.e., study hours, motivation, and academic stress), which show the proportion of the variance in the observed values that is due to the differences between individuals (Kim, 2009), indicated that the greater proportion of the variance in all three variables was due to differences *within* persons (i.e., between days) rather than *between* persons (see Table 1). This result suggests substantial day-to-day variation in students' study hours, study motivation, and academic stress during the week and provides further empirical support for our choice of multilevel modeling as the method of analysis (Luke, 2004). In our model, variation in study hours, motivation, and academic stress between days was modeled on the *within level* (i.e., within individuals) and differences in the proportions of the

latent classes (i.e., latent profiles) between individuals were allowed to vary on the *between level*.

First, in the analysis, the variable-oriented method was used in which the diary variables (i.e., study hours, motivation, and academic stress) were regressed on the background variables (e.g., gender, family form). Second, to answer to the second research question, the person-oriented method was used to identify possible latent profiles in the diary variables of study hours, study motivation, and academic stress. In this multilevel latent profile analysis (MLPA), the aim was to detect latent profiles that differ in their mean values of the three studied variables on the within-individual level across seven days (Mäkikangas et al., 2018). All possible profiles emerged from the data for all individuals (i.e., students) in differing proportions. The observations of the three variables for each of the seven days were then able to be associated with a specific latent profile. The proportion of latent profiles was able to vary randomly between individuals and this variation was accounted for on the *between level* (i.e., between individuals).

To test the number of latent classes we used the Bayesian information criterion (BIC) which has proven to work more effectively than many other criteria in the MLPA context (see, e.g., Mäkikangas et al., 2018). To evaluate the quality or distinctiveness of a latent class solution, average posterior probabilities (AvePP) were calculated. AvePP was calculated for each class k across individuals on the basis of the strongest association (e.g., denoting highest posterior probability) with class k.

Finally, the third research question was addressed by examining the associations of the daily study profiles (i.e., latent profiles) with the factors promoting and impairing wellbeing. Using the Wald test, we tested the dichotomous variables (i.e., factors promoting and impairing wellbeing) in the final accepted MLPA model by setting the mean parameters as starting values and estimating the thresholds of the dichotomous variables. Additionally, pairwise comparisons of the threshold variables were tested by defining new parameters in Mplus.

6 Results

6.1 Descriptive results

Table 1 shows the means and standard deviations for study hours, study motivation, and academic stress separately for each day of the week and across the week, and the intra-class correlations (ICCs) of the variables. With

Table 1: Means and standard deviations of study hours, study motivation, and academic stress on each day of the study week and across the week, and their intra-class correlations ($N = 602$).

	Study hours		Study motivation		Academic stress	
	M	SD	M	SD	M	SD
Monday	4.40	2.31	4.32	1.81	4.05	1.65
Tuesday	4.15	2.81	4.07	1.80	3.54	1.38
Wednesday	4.52	2.75	4.47	1.55	3.24	1.62
Thursday	4.02	2.86	4.14	1.87	2.85	1.69
Friday	3.19	2.69	3.80	1.99	2.20	1.46
Saturday	1.48	2.26	2.58	2.05	2.07	1.48
Sunday	1.82	2.09	2.63	1.90	2.57	1.82
Across the week	3.39	1.73	3.71	1.23	2.92	1.09
ICC	.248		.241		.252	

respect to the aggregated (i.e., weekly) means, students reported moderate or low study hours, study motivation, and academic stress during the study week. As mentioned above, the ICC values for the three variables indicated substantial day-to-day variation in the students' study hours, study motivation, and academic stress during the study week.

With regard to daily differences in study hours, motivation, and academic stress, Table 1 shows that Monday was the most stressful day for students in terms of academic demands and that study hours and study motivation also were rather high. Wednesday showed another peak for study hours and motivation, while the level of academic stress decreased each day from Monday to Saturday. Compared to Saturday, Sunday showed a rather steep rise in the mean academic stress level. This may indicate the need for students to prepare mentally or practically for the forthcoming study week, thereby raising their level of alertness with regard to their studies. Overall, the students reported a lower number of study hours and lower levels of study motivation and academic stress at the weekend. This was expected, given that, for many students, the weekend represents leisure time free from studying, or at least from lectures and classes which require attendance at the university.

Regression analysis was used to explore the associations of study hours, motivation, and academic stress with background characteristics on the *between level* (i.e., between students). The analysis revealed that students who were more satisfied with their financial situation reported studying more ($\beta = .28$, $p = .024$) and

being more motivated to study ($\beta = .34$, $p = .004$) than students who were less satisfied with their financial situation. With respect to family form, students who were single reported studying more hours ($\beta = .29$, $p = .021$) and experiencing more stress ($\beta = .42$, $p < .001$) than students who were in a relationship or had a family with children. The students in a relationship reported less stress than those who were single or had a family with children ($\beta = -.55$, $p < .001$). Older students reported greater study motivation than younger students ($\beta = .44$, $p < .001$). International students reported more study hours than Finnish-speaking students ($\beta = .44$, $p < .001$). Study hours, motivation, and academic stress were not associated with either gender or working alongside studying.

6.2 Factors promoting and impairing students' daily wellbeing

Our first research aim was to identify what factors university students report as promoting and impairing their daily wellbeing. After coding the open answers, seven factors promoting and eight factors impairing students' daily wellbeing were identified (see Table 2).

Leisure time and domestic duties was the factor most frequently mentioned as promoting daily wellbeing. This category encompassed mentions of having leisure time and spending it engaged in activities with family and friends, or in hobbies. Some students reported leisure activities such as having a laugh, having fun or breaking away from everyday routines as benefiting their daily wellbeing. Others also enjoyed having time for themselves, for example, going to sauna, watching television or movies, or just relaxing in peace and quiet at home. Cleaning the home was also considered to promote daily wellbeing among those who preferred their home to be aesthetically pleasing and well ordered. On the negative side, factors such as lack of leisure time, domestic duties left undone, and other responsibilities outside study hours (e.g., ferrying children, paid work) were considered as impairing daily wellbeing.

Social relations was another factor cited both as promoting and as impairing daily wellbeing. Having close relationships with family and friends, conversing with them, enjoying their company, and receiving support from others on study- and personal life-related issues were seen to promote wellbeing. However, social relationships impaired wellbeing when, for example, students found themselves in arguments or conflict with their close ones. Changes in relationship status, lack of interaction with

Table 2: Frequency of factors that promoted or impaired the wellbeing of students ($N = 602$).

Factors that promoted or impaired wellbeing	Frequency of mentions of factors that promoted wellbeing		Data examples	Frequency of mentions of factors that impaired wellbeing		Data examples
	f	%		f	%	
Leisure time and domestic duties	238	39.5	*Leisure time, relaxing activities and hobbies*	15	2.5	*No time for leisure or domestic duties*
Social relations	222	36.9	*Talking to and spending time with friends, family, spouse, and receiving social support*	15	2.5	*Conflicts with family and friends, loneliness*
Sleep, rest, and nutrition	110	18.3	*Good quality and quantity of sleep, delicious and nutritious food*	104	17.3	*Fatigue, poor quality or quantity of sleep, hunger, irregular or no meals*
Physical activity	91	15.1	*Physical exercise (e.g., jogging, yoga)*	9	1.5	*Lack of exercise, sitting all day*
Studying	57	9.5	*Study advancement and completion of study assignments, parts of thesis etc.*	49	8.1	*Burden of assignments, problems with studies*
Time management	55	9.1	*Planning, organizing, prioritizing, no feelings of being in a rush or hurry*	80	13.3	*Feelings of being in a rush, time pressure*
Motivation and psychological factors	47	7.8	*Feeling of balance, happy and positive mood, and happiness*	76	12.6	*Experience of stress, feeling of insufficiency, darkness*
Illnesses and physiological condition				73	12.1	*Flu, headache, allergies, and PMS symptoms*
Missing	105	17.4		106	17.6	
Total	602	100.0		602	100.0	

others, and loneliness were also mentioned as impairing daily wellbeing.

Sleep, rest, and nutrition were among the factors most frequently mentioned as both promoting and impairing daily wellbeing. Having a healthy diet, enough rest and sleep during days and nights, and a regular eating and sleeping rhythm was considered beneficial for wellbeing, whereas hunger, lack of lunch breaks, tiredness, early mornings, poor quantity and quality of sleep, and an irregular sleeping rhythm were seen to impair daily wellbeing.

Physical activity was also considered to affect daily wellbeing. On the one hand, exercising and doing sports (e.g., badminton, biking, running, yoga) benefitted students' daily wellbeing. On the other hand, lack of exercise due to incapability (e.g., headache, lack of energy) or lack of time were seen to impair wellbeing.

Studying was also mentioned as a factor promoting wellbeing by some and as impairing wellbeing by others.

On some days, students were inspired by studying or had participated in interesting classes. Moreover, finishing assignments or parts of a thesis and group studying were considered inspirational and beneficial for daily wellbeing. On other days, a heavy academic workload, poor performance in assignments, and problems with studies, for instance, were mentioned as impairing daily wellbeing.

Time management was also mentioned by some students as impacting on their daily wellbeing. There were days in which the clear planning, organizing and prioritizing of one's studies, having appropriate goals, having sufficient time to study, and loose schedules were considered to promote wellbeing, whereas uncompleted studies, lack of time to study or finish assignments, tight deadlines, and feelings of being in a rush impaired daily wellbeing.

Motivation and psychological factors formed the last category of factors promoting daily wellbeing and

included having the motivation to pursue one's studies and overall positivity, including positive emotions and mood (e.g., happiness, contentment, feeling good), perceiving oneself as having an overall balanced life, seeing one's studies as meaningful, and conscious relaxation. Motivational and psychological factors that were considered to impair wellbeing encompassed, for instance, the experience of stress, darkness and lack of daylight, stage fright, problems with one's personal appearance, worrying over studies, poor concentration skills, and feelings of insufficiency and ineffectiveness.

Finally, *illnesses and physiological factors impaired* daily wellbeing. These included physiological illnesses and conditions, such as flu, migraine, sensations of pain in different parts of the body, and allergies. Some female students also considered their PMS symptoms as negatively affecting their daily wellbeing.

6.3 Daily study profiles

Our second research aim was to investigate what types of daily study profiles can be identified for university students based on their self-reported study hours, study motivation, and academic stress. MLPA was used to identify these daily study profiles. First, one to six latent class solutions were estimated. The latent profiles were defined on the *within level* (i.e., between days) so that each of the seven days showed specific profiles based on study hours, study motivation, and academic stress. These daily profiles were allowed to vary within individuals from day to day so that each individual had a certain proportion of estimated latent profiles. Differences in the proportions were accounted for on the *between level* (i.e., between students).

The BIC value clearly decreased from the one to four latent profile solutions (7005.94, 6660.96, 6535.23, 6420.38, respectively), showing a clear improvement in model fit. For the models that included five and six latent profiles, the decrease in the value of BIC was only slight (BICs for the five and six class solutions were 6403.30 and 6374.97, respectively). In addition, after examining and interpreting the four, five and six profile solutions, we ended up using the four latent profile solution, as it simplified interpretation of the results and the latent profiles were clearly distinct from each other according to the posterior probabilities. In the four latent profile solution, the average posterior probabilities (AvePP) for latent profiles 1, 2, 3 and 4 were .92, .92, .86 and .95, respectively, showing clearly distinct profiles.

Next, we carefully studied the level of study hours, motivation, and academic stress in the four identified profiles (i.e., latent profiles) and gave the profiles appropriate names (see Figure 1). Below, in describing the profiles, we use the term effort to refer to the combination of study hours and motivation that reflects students' devotion to their studies (see Greene & Maggs, 2015; Pierro et al., 2006). Accordingly, **Profile 1,** which accounted for 24.3% of the 602 days, was named "*intense study days,*" owing to the rather high levels of study hours, study motivation, and academic stress reported by students on those days. **Profile 2** was the largest daily profile, comprising 30.6% of the days, and was named "*productive* study days," as those were the days on which students reported moderate effort in terms of study hours and motivation and a low stress level. The term productive indicates that students were able to advance their studies without feeling stressed about them. **Profile 3** contained 20.2% of the days and was named "*inefficient* study days," owing to the moderate levels of study hours and study motivation and the rather high level of stress reported on those days. The term inefficient describes days during which students experienced rather high levels of academic stress and did not (or were unable to) invest as much effort in studying as they did on productive days. **Profile 4** comprised 24.9% of the days and was named "*leisurely* study days," owing to the low levels of study hours, study motivation, and academic stress reported on those days.

6.4 The associations of daily study profiles with the factors promoting and impairing wellbeing

Our third research aim was to investigate whether the four daily study profiles associated with the factors that the students considered as promoting and impairing their daily wellbeing. We included one auxiliary variable at a time in the LPA model and estimated the threshold. In these models, the mean and size of the profiles remained equal to those of the initial LPA model, indicating that the results can be used in testing the associations between the latent profiles and each factor promoting or impairing wellbeing. Table 3 presents the proportions calculated from the estimated thresholds. Equality of thresholds between the latent profiles was tested with the Wald test, as shown in the fifth column in Table 3, and follow-up pairwise tests calculated with the help of new variables, as shown in the sixth column.

Table 3: Differences between the study profiles in the associations of daily study profiles with factors increasing and impairing daily wellbeing (*N* = 602).

	Profile 1 *Intense study days*	Profile 2 *Productive study days*	Profile 3 *Inefficient study days*	Profile 4 *Leisurely study days*	Differences between the profiles	
					Wald test p (overall)	*Group differences (p < .05)*
Factors promoting daily wellbeing						
Leisure time and domestic duties	0.371	0.531	0.375	0.578	.017	1 < 2; 1, 3 < 4
Social relations	0.488	0.436	0.374	0.457	.715	
Sleep, rest, and nutrition	0.292	0.185	0.216	0.215	.580	
Physical activity	0.249	0.220	0.134	0.123	.235	
Studying	0.258	0.166	0.016	0	<.001	3, 4 < 1, 2; 4 < 3
Time management	0.110	0.206	0.019	0.072	.048	4 < 2
Motivation and psychological factors	0.097	0.124	0.056	0.089	.545	
Factors impairing daily wellbeing						
Leisure time and domestic duties	0.018	0.006	0.049	0.058	.054	
Social relations	0.057	0.029	0.039	0	<.001	4 < 1, 2, 3
Sleep, rest, and nutrition	0.257	0.148	0.303	0.168	.011	2, 4 < 3
Physical activity	0.047	0	0.026	0.008	<.001	2 < 1, 3, 4
Studying	0.201	0.028	0.208	0.009	<.001	2, 4 < 1, 3
Time management	0.270	0.085	0.270	0.063	<.001	2, 4 < 1, 3
Motivation and psychological factors	0.263	0.067	0.325	0.020	<.001	2, 4 < 1, 3
Illnesses and physiological condition	0.131	0.061	0.346	0.118	<.001	1, 2, 4 < 3

6.4.1 Factors promoting wellbeing

The relationships between three of the factors promoting wellbeing and the daily profiles were statistically significantly different (see Table 3). First, *leisure time and domestic duties* was differently related to profile 4 compared to profiles 1 and 3, and to profile 2 compared to profile 1. On "leisurely study days," students were more likely to have promoted their wellbeing by engaging in leisure time and domestic duties than on "intense study days" or "inefficient study days." Furthermore, on "productive study days," students were more likely to have promoted their wellbeing by engaging in leisure time and domestic duties than on "intense study days."

Second, *studying* was differently associated with profiles 1 and 2 compared to profiles 3 and 4; the results also showed a difference between profiles 3 and 4. Specifically, on "intense study days" and "productive study days," students were more likely to have striven to support their wellbeing by promoting their studies than on "inefficient study days" and "leisurely study days." A
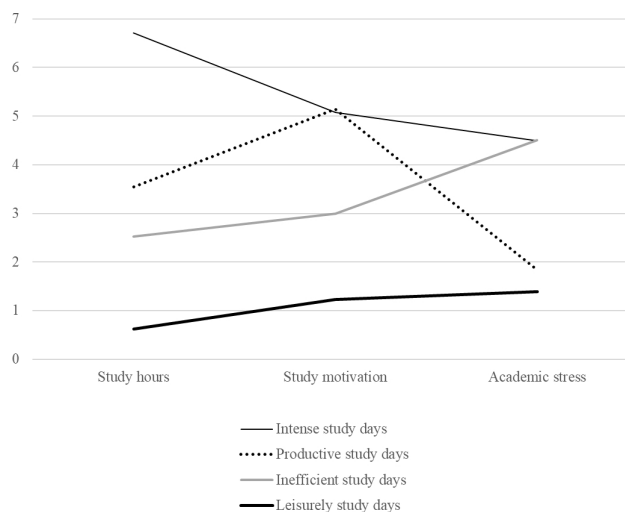
Figure 1: The four daily study profiles based on study hours, study motivation, and academic stress.

similar association was found for "inefficient study days," when more hours were spent on studying, compared to "leisurely study days."

Third, *time management* was differently related to profile 2 than profile 4. Accordingly, on "productive study days," students were more likely to have utilized time management to promote their wellbeing than on "leisurely study days."

6.4.2 Factors impairing wellbeing

The associations between seven of the factors impairing wellbeing and the daily profiles were statistically significantly different (see Table 3). First, *social relations* was differently associated with profiles 1, 2 and 3 compared to profile 4. This result indicates that on "intense," "productive," and "inefficient study days," negative aspects of the students' social relations (e.g., conflicts with family and friends, loneliness) were more likely to have been considered as impairing their wellbeing than on "leisurely study days."

Second, *sleep, rest and nutrition* was differently associated with profile 3 than with profiles 2 and 4. On "inefficient study days," students were more likely to have perceived poor nutrition or tiredness, for instance, to be related to their reported impaired wellbeing than on "productive" and "leisurely study days."

Third, *physical activity* showed different associations with profiles 1, 3 and 4 than with profile 2. The result indicates that, compared to the other three types of study days, on "productive study days," students were less likely to have experienced lack of physical exercise or sitting all day to have impaired their daily wellbeing.

Fourth, *studying*, *time management*, and *motivation and psychological factors* were differently related to profiles 1 and 3 than to profiles 2 and 4. Accordingly, on the days that students reported experiencing a rather high level of stress (i.e., "intense" and "inefficient study days"), they were more likely to have reported, for example, that the burden of assignments and tight deadlines, high workload, feelings of being in a rush, time pressure, and feelings of insufficiency were associated with their impaired daily wellbeing than on days when they reported a lower level of stress (i.e., "productive" and "leisurely study days").

Finally, *illnesses and psychological condition* was differently associated with profile 3 than with the other profiles. On "inefficient study days," students were more likely to have reported flu, allergies, and other illnesses as impairing their wellbeing than on other types of study days.

7 Discussion

In this study, we utilized mobile diary data to explore the factors university students consider as promoting and impairing their daily wellbeing. We also examined what types of daily study profiles can be identified on the basis of study hours, study motivation, and academic stress, and how such profiles are associated with the wellbeing-related factors. Data were collected once a day and for one week via mobile diaries by university students on a methods course at a Finnish university.

In answer to our first research question, we identified seven factors promoting and eight factors impairing students' daily wellbeing. *Leisure time and domestic duties* (also e.g., Brajša-Žganec et al., 2011; Zhang & Zheng, 2017) as well as *social relations* (also e.g., Awang et al., 2014; Kunttu et al., 2016; Wilcox et al., 2005) were the factors most frequently mentioned as promoting students' daily wellbeing. Moreover, *sleep, rest and nutrition* as well as *physical activity* were commonly reported as promoting daily wellbeing, thereby indicating the importance for students of basic daily routines in maintaining their daily wellbeing (also e.g., Bray & Born, 2004; El Ansari et al., 2014; Galambos et al., 2009; Molina-García et al., 2011). Good quality sleep and nutritious diet for example, are central to wellbeing, as was confirmed by our findings that lack of or irregularity in sleep, rest and nutrition was also the factor most frequently mentioned as impairing daily wellbeing. This may be informative about the complexity of students' attitudes and behaviors regarding basic daily routines as while acknowledging that such routines would promote their wellbeing, they either may not invest in them sufficiently but instead, for example, reduce their sleep time in order to do something else or for other reasons find it difficult to maintain regular sleeping or eating habits. Other factors frequently mentioned as impairing daily wellbeing among the students in our study were linked with *time management* (also Kearns & Gardiner, 2007), which appeared, for instance as feelings of being in a rush, *motivation and psychological factors*, such as darkness or feelings of insufficiency, and *illnesses and physiological conditions*.

Generally speaking, the factors impairing wellbeing were much more rarely mentioned than those promoting wellbeing. This may indicate, on the one hand, that students encounter more situations that they perceive as beneficial to their daily wellbeing. On the other hand, students may find it easier to identify the factors that promote than those that impair their daily wellbeing. In sum, these findings are positive, as they show that students have plenty of resources on which to draw in

seeking to promote their daily wellbeing and encourage future studies to probe more deeply into the positive and negative sides of students' daily wellbeing.

In answer to our second research question, we identified four daily study profiles on the basis of students' study hours, study motivation, and academic stress. The results indicate that university students in Finland display various patterns of effort (i.e., study hours combined with motivation) and stress in their studies over the course of one study week. Two profiles, namely, "productive" and "leisurely study days" showed comparatively low levels of academic stress. On "productive study days," the students reported moderate levels of both study hours and motivation and a low level of stress, which indicates that on such days they were able to advance their studies and not feel too stressed about them. On "leisurely study days," in turn, study hours, study motivation, and academic stress levels were low, which may reflect leisure days largely free from studying and study-related stress. Both of these profiles were found on more days in the sample than the other two profiles, namely, "intense" and "inefficient study days" when stress levels were higher. On "intense study days," the students worked hard and were motivated to advance their studies and, at the same time, reported rather high levels of academic stress. On "inefficient study days" academic stress levels were similar, but the students did not make (or were unable to make) as much effort to advance their studies as they did on "intense study days."

The results on our third research question showed, first, that the four daily study profiles were differently related to three factors promoting students' daily wellbeing. On "leisurely study days," the students were more likely to promote their wellbeing by engaging in *leisure time and domestic duties* compared to study days when their stress levels were higher (i.e., "intense" and "inefficient study days"). This may indicate that on days when the study hours, study motivation, and academic stress are low, the students have more time and energy for activities outside their academic responsibilities, which may further promote their wellbeing and life quality (see Brajša-Žganec et al., 2011; Kim et al., 2015; Zhang & Zheng, 2017). The results further showed that on "productive study days," engagement in leisure time and domestic duties was also considered to have promoted wellbeing compared to "intense study days." A plausible explanation for this is that on days when students study fewer hours and do not feel particularly stressed, they find it easier to distance themselves from their studies and focus on enjoyable leisure activities and home duties.

On "intense" and "productive study days," students were more likely to promote their wellbeing by *studying*, that is, by advancing their studies compared to "inefficient" and "leisurely study days." This finding is not surprising, as on "intense" and "productive study days," the students studied more hours and were more motivated to study compared to the other two types of study days. However, their stress levels were higher on "intense study days," than on "productive study days." According to Litmanen (2015), academic stress, in a more positive light, can be seen as a motivator to strive towards one's goals. Perhaps on "intense study days," characterized by high effort and stress, students were striving towards their goals (e.g., getting a paper done, attending an exam), activities which may have increased their stress levels momentarily but which, in the bigger picture, they perceived as promoting their overall wellbeing. Promoting one's studies calmly on "productive study days" with moderate effort also appears to contribute positively to students' wellbeing, as indicated by the low level of academic stress. However, even on "inefficient study days," when studies were promoted with moderate effort but combined with rather high levels of stress, students were more likely to perceive that studying promoted their wellbeing compared to "leisurely study days," when they reported minimum study effort and a low level of academic stress. This may indicate that advancing one's studies, even moderately, is important for students' wellbeing.

On "productive study days," when study effort was moderate and stress level low, the students were more likely to have promoted their wellbeing by *time management* than on "leisurely study days." It is possible that on "productive study days," students planned, prioritized, and organized their studies, and thus managed to promote their studies and not feel stressed about them, outcomes which they may then have perceived as promoting their overall wellbeing (also Kearns & Gardiner, 2007). According to Stelnicki et al. (2015), students consider time management an important factor in their academic success, and thus one which may also contribute to higher wellbeing. Time management may also be a conscious strategy for coping with academic stress (see Moilanen et al., 2020), which may help explain the low stress levels on "productive study days" when studies were promoted. However, on "leisurely days," when study hours, motivation, and stress are all low, time management regarding studies may not be necessary.

Second, the seven factors identified as impairing students' wellbeing were differently and significantly associated with the four daily study profiles. For the first of these, *social relations*, the results showed that on all

types of study days, except "leisurely study days," when the levels of study effort and stress were low, the students tended to perceive negative aspects of their social relations as impairing their daily wellbeing. It is possible that while students considered lack of interaction with others or loneliness to impair their wellbeing on heavier study days ("intense," "productive," and "inefficient study days"), they were able, on lighter study days (i.e., "leisurely study days"), to spend more time with their families and friends than on the other types of days. Previous research has also shown the importance of social relations, activities, and support for students' study motivation and overall wellbeing (e.g., Awang et al., 2014; Basson & Rothmann, 2018; Chao, 2012; Wilcox et al., 2005). It is also possible that arguments or conflicts with fellow students or close ones were more likely on days when students studied more and were more stressed ("intense" and "inefficient study days"), leading them to perceive social relations as impairing their daily wellbeing.

Problems with *sleep, rest and nutrition* were more likely perceived to impair wellbeing on "inefficient study days" when the students reported rather high stress compared to study days characterized by a low level of stress (i.e., "productive" and "leisurely study days"). An unhealthy diet, especially among female students, has been related to higher stress (Mikolajczyk et al., 2009), and poor sleeping habits have been associated not only with stress but also with decreased time spent on studying and increased likelihood of skipping classes (Galambos et al., 2009; Lund et al., 2009). It is therefore understandable that lack of sleep or proper meals, which often lead to low energy levels, are more likely on stressful days, and hence may lead students to invest only moderate effort in studying and easily perceive them as impairing overall wellbeing. Another plausible explanation is that even if nearly as much effort was invested in studying on both "inefficient" and "productive study days," stress levels were lower on "productive study days" because students were able to take more breaks and eat more regularly and healthily, factors that have been shown to reduce stress levels (El Ansari et al., 2014), than on "inefficient days." Moreover, better sleep quality and quantity on leisure days (see Galambos et al., 2009; Tsui & Wing, 2009) may help explain the difference between "leisurely" and "inefficient study days."

Irrespective of the level of study effort, on "intense" and "inefficient study days," when the students experienced rather high stress, they considered factors relating to *studying*, *time management* and to *motivation and psychological factors* to impair their wellbeing than on days when their stress levels were lower (i.e., "productive"

and "leisurely study days"). Seemingly, when students feel stressed, they may more easily perceive that, for instance, problems with studies, tight deadlines, high workload, and feelings of inadequacy impair their wellbeing. It is also possible, however, that all these perceived factors contribute to stress among students.

Physical activity, that is, lack of physical exercise or energy, was perceived to impair wellbeing, particularly on days when stress levels were high ("intense" and "inefficient study days") but also on "leisurely study days" characterized by low study effort and low stress levels. Perhaps, when students need to invest high or moderate effort in their studies, it leaves them little time for physical exercise, which has been shown to be an important strategy for coping with stress (Giacobbi Jr. et al., 2007). It is somewhat surprising that the lack of physical exercise was also seen to impair wellbeing on "leisurely study days;" however, this may be explained by students suffering from flu or other illnesses on some of those days. In this connection, our results showed, finally, that on "inefficient study days" when the students reported moderate study effort and rather high stress, they also reported that *illnesses and* other *physiological conditions* (i.e., flu, allergies, and other illnesses) were more likely to have impaired their wellbeing than on the other types of study days. This may indicate that on "inefficient study days," students were trying moderately to progress their studies, possibly in order to meet a deadline or because of taking an exam – hence the rather high stress – and that, because they were not feeling at their best, they considered this as impairing their wellbeing. This interpretation would need more research to gain support, but at the same time, it shows how important it is that students have an opportunity to rest and recover when they are ill or are in other situations that impair their performance.

In addition to the results related to our specific research questions, the study furthered understanding on the daily dynamics of university students' study week. On average, the present university students reported moderate or low study hours, study motivation and academic stress during the study week. However, in line with the findings of previous studies (see Dörnyei, 2000; Greene & Maggs, 2015; Moilanen et al., 2020), our results confirmed that the study hours, study motivation, and academic stress reported by the students did not remain constant but varied across the study week. The day-to-day variation in study hours revealed by our data showed that on weekdays, students tended to study for longer periods of time than at the weekend. On average, the participants studied slightly less (3.39 hours a day) than the mean of 4 hours a day found by Kunttu et al. (2016) for university

students in Finland. One explanation for the difference is that the participants of our study were slightly above the mean age of university students in Finland (see Potila et al., 2017) and many of them were in paid employment in addition to their university studies. This accords with Kunttu et al. (2016), who found that older students tend to study for shorter hours and also to spend more time in paid employment than younger students, which may affect their number of weekly study hours. Another possibility is that weekly study hours vary from week to week. To resolve this issue requires diary data collected over a longer period of time.

Participants' study motivation varied from moderate to rather low across the week. According to Dörnyei (2000), this may relate to the changing mental processes associated with studying and to the process of mastering one's studies. Our data also showed that study motivation and study hours varied consistently, meaning that on days when study hours were high, study motivation was also high and vice versa. We did not observe similar daily consistency with stress levels, as these were highest on Monday and lowest on Friday and Saturday. Given that students also study at weekends, they would need a more comprehensive break from studies at weekends to replenish the resources needed to cope with academic stress (see Lazarus & Folkman, 1984) possibly triggered by the beginning of the next study week. Previous studies also indicate that, worldwide, students in higher education experience rather high levels of stress (e.g., Kunttu et al., 2016; Robotham & Julian, 2006; Stallman, 2010; Storrie et al., 2010). However, the present study presents a more encouraging picture of the situation than, for example, the University Student Health Survey (Kunttu et al., 2016), which showed that as many as 33 per cent of Finnish university students experience considerable stress. The differences between these results may partially be explained by the methods of data collection used. On the one hand, the daily mobile diaries revealed new aspects relating to the daily wellbeing of university students. On the other hand, the timing of the study week, which was close to the Christmas break, is likely to have had influenced both study hours and levels of motivation and stress.

7.1 Limitations and future research

This study has its limitations. First, we only collected mobile diary data for one week, and thus were unable to take into account different seasons or semesters, including an academic year. In future studies, to facilitate

the comparison of findings at different points in time, we recommend that data are collected with more temporal variation. That said, the use of mobile diaries meant that the students were able to evaluate their feelings and experiences daily, which may be easier than recalling them later on as well as yielding more accurate data with fewer memory recall errors (see Malinen, Rönkä, & Sevón, 2015). Second, since most of the present participants were female, the experiences of male students were underrepresented in the data. Because previous findings show that male students tend to study for shorter hours (Greene & Maggs, 2015; Kunttu et al., 2016) and experience lower levels of academic stress than females (Reisberg, 2000), it would be important to recruit more males in future studies. Moreover, the study comprised data solely from Finland, and thus the results may not be fully generalizable to other country contexts. Third, previous studies show that students' age and stage of studies are related to their study routines and wellbeing experiences. For example, older students (usually master's students) tend to study for shorter hours than younger students (Kunttu et al., 2016) and experience greater study burnout and show less academic engagement than those in the earlier stages of their studies (Salmela-Aro & Read, 2017). As the present data were produced by master's students only, it would also be essential to explore the experiences of bachelor's students. Fourth, owing to the lack of previous studies with diary designs and students in a similar study phase (master's-level students), we also had to include studies from younger age groups in earlier study phases. Finally, despite the longitudinal design, the data do not allow inferences to be drawn on the causality of the associations. Thus, there is a possibility for reverse causality in the association between the study day profiles and factors related to wellbeing. Therefore, in future research, it would be important to explore these causalities with study designs suited to such objectives.

7.2 Implications

The present study has some important implications. First, the finding of day-to-day variation in the wellbeing of higher education students may help teachers and practitioners better understand that students' wellbeing is related not only to personal characteristics but also to different time periods and moments. Such awareness could help teachers design more flexible and individual ways for students to learn and progress their studies at different times. Second, this study shows that by exploring variation in wellbeing it is possible to identify

the moments when the risk for impaired wellbeing is at its highest and to design strategies aimed at preventing this in the future. However, to do this, it is also essential to know when students' wellbeing is at a high level. Third, the present study showed that the factors promoting and those impairing students' wellbeing are numerous. In future, students could be encouraged to identify these factors more closely and to utilize that information in planning both their studies and daily life. This study especially highlighted the importance for students' wellbeing of attending to basic daily routines, such as ensuring adequate sleep time and nutrition, topics on which higher education students could be even better informed. Moreover, the finding that students considered leisure activities to promote their daily wellbeing on days with low stress levels may highlight the importance of how activities outside academic life can potentially support student wellbeing. The actions described above may not only promote wellbeing but also academic success. Finally, daily diaries could perhaps also be utilized more frequently as a tool for promoting students' wellbeing via self-reflection, for which evidence has also been found in previous studies (e.g., Travers, 2011).

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