LUND UNIVERSITY
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Long-Term Impact of the Covid-19 Pandemic on the Life Satisfaction of University Students in Germany

by

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This thesis analyses the effect of the Covid-19 pandemic on the life satisfaction of students in Germany one year after the start of the pandemic. The motivation for this thesis is the lack of studies to date that analyse the long-term effect of the Covid-19 pandemic on life satisfaction. In a difference-in-difference design, I compare the development of German students who were in their first year of university during the start of the pandemic (N=522) with a group of students who started their studies without Covid-19 (N=1,163). Furthermore, the impact of the pandemic on different demographic groups was analysed. The results indicated a negative effect of the pandemic on the life satisfaction of students in Germany. The analysis revealed that the effects of the pandemic were more pronounced in males than in females. Migration background and parental education did not exert a significant influence on the impact of the Covid-19 pandemic on life satisfaction. Finally, this thesis examines various aspects that influence life satisfaction.

Keywords: Covid-19, pandemic, life satisfaction, subjective well-being, university students, difference-in-difference, Germany

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1 Introduction

The global Covid-19 pandemic has had a profound impact on the lives of individuals and communities across the globe. In response to the emergence of the novel coronavirus outbreak, a series of measures were swiftly implemented with the objective of limiting its spread. The measures have had a profound impact on the manner in which individuals interact with one another. The practice of physical contact was curtailed by the implementation of social distancing measures, while the prevalence of home-office work and online teaching reduced the frequency of in-person social contact in the workplace and education institutions.

A number of studies conducted around the globe have identified a negative impact of the Covid-19 pandemic on life satisfaction, levels of depression and anxiety, and uncertainty about the economy and financial situation (Daly & Robinson, 2021; Fried et al., 2022; Rodríguez-Rey et al., 2020 among others). While young adults are less susceptible to the physical health effects of Covid-19, the studies indicate that the life satisfaction of young adults has decreased more than that of other age groups (Preetz et al., 2021). The interpersonal relationships of young adults have been negatively affected by a number of factors, including social distancing guidelines and the closure of educational institutions. Restricted mobility has also played a role in this regard. The lack of in-person contact can lead to an increase in feelings of loneliness, depression, or anxiety (Elmer et al., 2020).

Young adults in Germany suffered severe restrictions as Germany was one of the countries in Europe that had the longest and strictest Covid-19 restrictions (Mathieu et al., 2020). People were only allowed to work from home, the number of people meeting was restricted and in some cases the times and places where people were allowed to move around, and meet were also limited (Bundesministerium für Gesundheit, 2023). Studying for university had to be done from home and at times their social and leisure lives were severely restricted. They had to react to new online offers and new, Covid-19-adapted online examination formats during their studies. Young people who worked alongside their studies lost their jobs and had financial problems in addition to the switch to online teaching formats (Andresen et al., 2021). Young adults are particularly vulnerable in times of crisis, as they may have less experience from

previous life disruptions and adaptation processes (Weinberger et al., 2018). A survey by Andresen et al. (2021) shows that over 50% of young people in Germany feel that their concerns have not been heard enough in politics during the pandemic and around 68% are at least partially afraid for their future.

The Federal President of Germany also addressed these concerns and hardships in his address to students at the start of the 2021 summer semester (Der Bundespräsident, 2021). In this speech, the Federal President placed particular emphasis on the implications of the fact that society had not sufficiently taken into account "what the sudden rent in time, the being on hold, means for young people" (Der Bundespräsident, 2021). Furthermore, the Federal President underscored the significance of young people in shaping the future of Germany and the pivotal role that university experiences play in this regard (Der Bundespräsident, 2021). "Society must not turn a blind eye to how the young generation is to emerge from this crisis of a century" (Der Bundespräsident, 2021).

1.1 Motivation and contribution

Most of the studies on the well-being of students analyse well-being at the beginning or for a few months into the pandemic (Mækelæ et al., 2020; Magson et al., 2021; Preetz et al., 2021). A lack of attention is paid in the literature to the subsequent development of the situation, with a particular focus on the period following the initial outbreak of the pandemic. It is of paramount importance to analyse the long-term effect of the Covid-19 pandemic on life satisfaction in order to identify potential long-term consequences at an early stage. Furthermore, most studies analysing changes in life satisfaction lack a control group, which limits the ability to accurately estimate causal effects. Even longitudinal studies, such as those conducted by Preetz et al. (2021), are unable to fully separate these effects. To the best of my knowledge, Preetz et al. (2021) conducted the only longitudinal study that has analysed the well-being of university students in Germany. In their study, Preetz et al. (2021) examine the evolution of life satisfaction and mental health among students in Germany up to the summer of 2020. The study compares the results with those obtained prior to the pandemic.

It is important to see how the pandemic has affected well-being in the long run. It is also of interest to ascertain how well-being has evolved over time in comparison with a control cohort who commenced their studies without the influence of the pandemic. It helps excluding the

potential natural fluctuations in life satisfaction. The objective of this paper is to analyse the impact of the Covid-19 pandemic on the life satisfaction of students one year after the outbreak in Germany. This will enable a better understanding of how young adults' life satisfaction developed during the Covid-19 pandemic. A particular focus is on the influence of the pandemic on specific demographic groups. The paper employs a difference-in-difference design (DiD) to analyse the impact of the Covid-19 pandemic on students' life satisfaction. Furthermore, the study examines the heterogeneity effects for three demographic groups and investigates the development of students' life satisfaction up to the winter of 2021/22. To achieve this, I will address the following questions:

How has the Covid-19 pandemic influenced the life satisfaction of German students one year after the initial outbreak?

What are the varied effects of the Covid-19 pandemic on life satisfaction among different demographic groups?

1.2 Thesis outline

In order to address the research questions that have been posed, the thesis will be structured as follows. Chapter 2 will give an insight into the existing theory and previous research on the well-being and inequalities during Covid-19. Chapter 3 will give you a country background about German universities, Covid-19 in Germany and about studying at a German university during Covid-19. Then, in Chapter 4, I will provide an overview of the data I am using. Following this, I will present my model in Chapter 5. My results will be shown in Chapter 6 and in Chapter 7 I will discuss them and describes possible further studies on this topic. Chapter 8 draws the conclusion.

2 Literature review

This chapter offers an overview of the existing theoretical framework for understanding subjective well-being. Subsequently, a more detailed examination of existing research on subjective well-being during the Covid-19 period will be conducted. Furthermore, I will examine the existing research on inequalities during the pandemic, with a particular focus on inequalities at universities during the pandemic.

2.1 Subjective well-being

Subjective well-being is about what makes a person feel positive about their life (Diener, 2009, p. 13). This description can also be referred to as life satisfaction and depends on the standards by which the respondent defines a good life. Life satisfaction is a key indicator of subjective well-being (Alderson & Katz-Gerro, 2016). Furthermore, it is the most prevalent indicator of an individual's cognitive evaluation of their overall life experience (Alderson & Katz-Gerro, 2016). A multitude of factors influence life satisfaction. The relative importance of different areas of life in influencing life satisfaction varies from person to person and also depends on the age of the individual (Diener, 2009, p.17). The trajectory of well-being exhibits a U-shaped pattern over the life cycle of humans (Blanchflower, 2021). This development of well-being is not contingent on geographical location, whether in a developed or developing country, the language spoken, or the life expectancy at birth. (Blanchflower, 2021).

2.2 Previous research on subjective well-being

2.2.1 Subjective well-being during the Covid-19 pandemic

A number of studies have already been conducted on the well-being of individuals during the covid-19 pandemic (Neugebauer et al., 2023; Preetz et al., 2021; Sandner et al., 2023 among others). The majority of studies focuses on the immediate effects of the pandemic at the outset of the crisis, with only a few investigating the longer-term consequences of Covid-19.

During the period of the pandemic, various restrictions were implemented in different countries. Some restrictions had a greater impact on people's well-being than others. For instance, individuals between the ages of 18 and 81 from six countries, as reported by Mækelæ et al. (2020), indicated that the closure of educational institutions, such as kindergartens, schools, and universities, had a profound impact on them, whereas the cancellation of leisure activities, such as sports, and social distancing, had a comparatively minimal effect. Furthermore, Buffel et al. (2022) report that the prevalence of depression among students from countries with more stringent regulations on school closures, job closures and stay-at-home orders was higher than in countries with less restrictive regulations.

However, it is not only restrictions that have caused a decline in people's well-being during the pandemic. Various studies have identified a number of factors that have an impact on people's life satisfaction during the Covid-19 pandemic. These include health concerns, fear for others, fear for oneself or the future, and financial worries (Elmer et al., 2020).

A limited number of studies examining the development of young adults during the pandemic have been conducted (Graupensperger et al., 2022; Henseke et al., 2022; Sandner et al., 2023). These studies have typically focused on shorter periods, ranging from a few weeks to a few months. In a study conducted by Henseke et al. (2022) in February 2021 and March 2022 on 16- to 25-year-olds in the UK, the researchers observed that reduced social contact and concerns about career prospects and learning job skills in the UK were associated with lower life satisfaction during the pandemic. Nevertheless, the diagnosis of Covid-19 in the individuals themselves or in others was not found to be associated with lower life satisfaction (Henseke et al., 2022). Furthermore, the study revealed that life satisfaction has shown a modest recovery since February 2021. One potential explanation for this is that individuals began to interact with one another in person again, and concerns about the pandemic's impact on future employment prospects diminished (Henseke et al., 2022).

In a longitudinal study conducted in Washington State, USA, by Graupensperger et al. (2022) 18- to 23-year-olds were examined until August 2021. It was demonstrated that stressors related to the Covid-19 can have an impact on mental health and well-being. A study by Neugebauer et al. (2023) on high school graduates in Germany at the beginning of the Covid-19 pandemic revealed a sharp decline in life satisfaction during the pandemic and a persistently low level of life satisfaction in winter 2021/22. Sandner et al. (2023) also examined the well-being of high school students in Germany. Their findings indicated that well-being initially improved in

spring 2020, but subsequently declined. One explanation is the fact that the onset of the initial lockdown period was maybe perceived as a holiday (Sandner et al., 2023), as weekends and holidays are associated with greater well-being (Ryan et al., 2010). The negative long-term effect can be explained by an accumulation of school closure stress and other distancing measures, as students suffer from social distancing and home schooling and may fear a poorer education and fewer career opportunities (Sandner et al., 2023).

The assessment of life satisfaction is contingent upon the chosen educational path and the risk of educational failure (Sandner et al., 2023). The pandemic is contributing to a sense of insecurity among students regarding their future prospects. It is evident that young adults have made decisions about their education and carriers during the pandemic that they would not necessarily have made in the absence of the pandemic. These decisions have involved either choosing a specific path or opting out of one (Sandner et al., 2023)

2.2.2 Subjective well-being of university students

In summary, the pandemic has had a negative impact on students' life satisfaction and mental health in a number of ways. A greater sense of solitude resulting from social distancing has been linked to a decline in mental health (Buecker et al., 2020; Killgore et al., 2020; Lee et al., 2020). Nevertheless, a lack of interaction with fellow students has also been linked to poorer mental health outcomes (Preetz et al., 2021). Furthermore, uncertainty about the financial situation due to the loss of a job or internship during the Covid-19 pandemic can also lead to lower life satisfaction (Aucejo et al., 2020). A study conducted in Switzerland revealed that students exhibited elevated levels of stress, anxiety, loneliness, and symptoms of depression (Elmer et al., 2020). The stressors have shifted from concerns about social life to concerns about health, family, friends and the future (Elmer et al., 2020).

A longitudinal study by Preetz et al. (2021) examined 625 university students up to July 2020 and found a reduction in life satisfaction and mental health compared to pre-pandemic times. A decline in life satisfaction and mental health was identified in comparison with the situation prior to the onset of the pandemic. The largest proportion of students reported a decline in life satisfaction and mental health. Nevertheless, a quarter of students indicated that their life satisfaction had increased and that they had fewer mental health problems compared to before the pandemic (Preetz et al., 2021). The findings indicate the existence of a resilient subgroup that is effectively managing the challenges posed by the ongoing pandemic.

A longitudinal study is better placed to establish a causal link between the change in well-being and the pandemic. However, it is not possible to distinguish between the effects of general ageing and those of the pandemic, as there is no control group that has lived through this phase of life without Covid-19 and with which the effects can be compared.

The phase of emerging adulthood in which first-year students find themselves is typically characterised by an increase in agency and independence (Wood et al., 2018). This freedom, along with other positive experiences, such as educational achievements, can contribute to well-being. However, poor choices, like drug use, or negative experiences, such as school failure, can also have a negative impact on well-being in the short or long term (Wood et al., 2018).

2.2.3 Studies on Covid-19 and inequality

The global pandemic has contributed to the widening of inequalities in many countries. In the United Kingdom, the impact of the Covid-19 pandemic has been observed in a number of areas, including inequalities in education, the labour market, household living standards, mental health and wealth (Blundell et al., 2022). In particular, those of a lower socioeconomic status were negatively affected by school closures, and the prevalence of mental illness among these individuals increased further during the pandemic (Blundell et al., 2022).

In England, students from the lowest income backgrounds have been particularly affected by the lockdown, with 52% of them losing normal teaching hours (Major et al., 2020). In contrast, students from the highest income group only lost 40% of normal teaching hours (Major et al., 2020). In England, the 16-25 age group was most likely to experience job loss or reduced working hours (Major et al., 2020). In particular, students from the lowest income quintile are 9 percentage points more likely to believe that their grades will change as a result of the pandemic (Major et al., 2020). The survey revealed that 63% of respondents indicated that their well-being had been affected, while 68% stated that their future educational achievements would be affected (Major et al., 2020).

While family background exerts a relatively minor influence on the well-being of students during the Covid-19 pandemic, gender played a more significant role. Female students were found to be 12 percentage points more likely to have experienced a negative impact on their well-being as a result of the lockdown (Major et al., 2020). A study conducted in Switzerland revealed that female students tend to experience more adverse mental health outcomes in the

context of the stressors associated with the Covid-19 pandemic, including concerns about their health, the well-being of their families and friends, and their future prospects (Elmer et al., 2020).

In Sweden, as well, there were discernible contrasts in the manner in which specific demographic groups were impacted by the pandemic (Altmejd et al., 2023). The entire population experienced increased morbidity and mortality rates, loss of income, unemployment risk, and more difficult access to medical care. As demonstrated by Altmejd et al. (2023), those with low income or low education, as well as immigrants, are disproportionately more affected by the burden of the pandemic.

The ongoing pandemic in Germany has revealed a concerning degree of gender inequality (Czymara et al., 2021). During the initial four-week period of the first lockdown in Germany, women were more likely to experience a reduction in their paid working hours than men. In summary, Czymara et al. (2021) found that women were primarily concerned with social interactions and childcare during this period, whereas men were more focused on paid work and the economy. This may be attributed to the fact that men in Germany are more frequently the primary providers, while women engage in a greater amount of unpaid work (Czymara et al., 2021).

2.3 Hypotheses

A review of the existing literature led to the formulation of the following hypotheses, which will be analysed in the following sections:

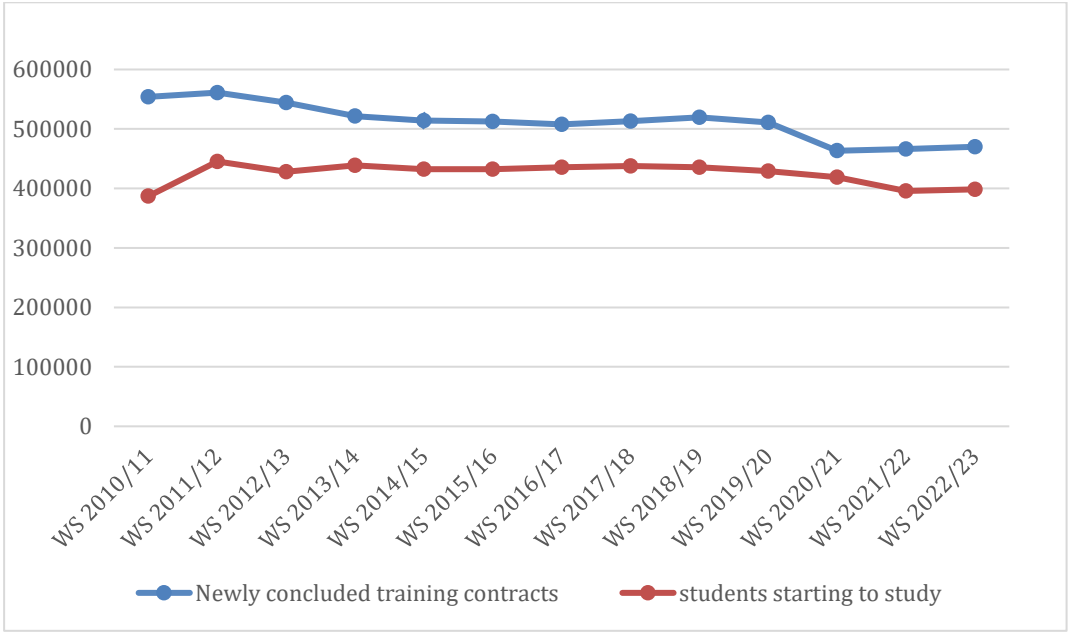
H1: *I expect a decline in life satisfaction of the students affected by the pandemic. I expect only a minor fluctuation in the life satisfaction of the students not affected by the pandemic.*
H2: *I expect a more pronounced decline in life satisfaction during the Covid-19 pandemic for women, students with migration background and students with less educated parents.*
H3: *I expect that life satisfaction did not recover to the pre-Covid-19 level in the winter 2021/22.*
H4: *I expect that there will be an increased perception of limitations to one's standard of living, a postponement of individual studies, an augmented sense of loneliness during the pandemic, and that individuals will report financial difficulties.*

3 Country context Germany

3.1 Studying in Germany

Those wishing to pursue further education after the completion of their secondary education have the option of either commencing an apprenticeship or enrolling in a degree programme. An apprenticeship can be initiated with any school-leaving qualification, although only those who have successfully completed the Abitur, the highest school-leaving qualification, after 12 or 13 years of school are eligible to commence a degree programme at university. All other school-leaving qualifications do not allow for enrolment in a degree programme. Should one be awarded another qualification, one may embark upon vocational training that will qualify them for a specific profession. Since 2010, there has been a decline in the number of people starting vocational training, while the number of first-year students has remained relatively steady (Figure 1). This may be due to the declining birth rate, which fell in the 1990s and 2000s, the birth years of the individuals in my study. (Statistisches Bundesamt, 2024d).

Figure 1: Number of students in Germany



Source: (Statistisches Bundesamt, 2024b, 2024c)

In Germany, there is a diverse range of higher education institutions, including universities and colleges. The colleges can be categorised according to their specific focus, such as technical, art and music, theological or pedagogical colleges (Heil, 2022). Additionally, there are state and private colleges and universities. State colleges and universities are corporations under public law and are the responsibility of the federal state legislature, as education in Germany is the responsibility of the federal states. In total, approximately three-quarters of higher education institutions are publicly owned (Heil, 2022).

The curricula of colleges are more vocationally oriented than those of traditional universities, with a greater emphasis on applied research. The integration of research and teaching is a fundamental aspect of university operations. In contrast to colleges, research should be conducted independently of direct social or entrepreneurial interests and serve solely the pursuit of knowledge. A doctorate can only be obtained at universities, theological or educational colleges, and in some cases at colleges of art and music.

Since the inception of the Bologna Process in 1999 (Kulturminister Konferenz, n.d.), the German higher education system has undergone a gradual transition towards a two-tier bachelor's/master's degree structure. The Bologna Process is a process designed to enhance the coherence of higher education systems in Europe (European Commission, n.d.). Currently, over 90% of all degree programmes in Germany are aligned with the two-tier system. The exceptions to this are human medicine, dentistry, veterinary medicine, law, pharmacy, food chemistry and the majority of teacher training programmes, which are subject to a state examination.

In general, studying in Germany is considered to be free of charge. However, students are required to pay semester fees, which are set independently by each university and college. Some universities include bus or train tickets in their semester fees, or opportunities to experience different types of culture. Consequently, the semester fees vary from university to university. For the winter semester 2023/24 the semester fees range from €67 for one semester to €395.89 for one semester between the 40 largest universities (Volz, 2023).

There are various ways for students to finance their studies. On the one hand, students may receive financial support from their parents or other family members. Many students also have part-time jobs. In addition, students may apply for funding in relation to the Federal Training Assistance Act (BAföG), scholarships, or loans (Deutsches Studierendenwerk, 2023a). BAföG is a popular way to finance one's studies. It is a form of funding that consists of 50% grant and

50% interest-free loan from the state. Once their studies have been completed, students are only required to repay the interest-free loan (Deutsches Studierendenwerk, 2023a). The objective of BAföG is to facilitate the pursuit of higher education for all, irrespective of their social background. The amount of BAföG received by an individual is contingent upon a number of factors, including parental income (Deutsches Studierendenwerk, 2023b).

3.2 Covid-19 pandemic in Germany

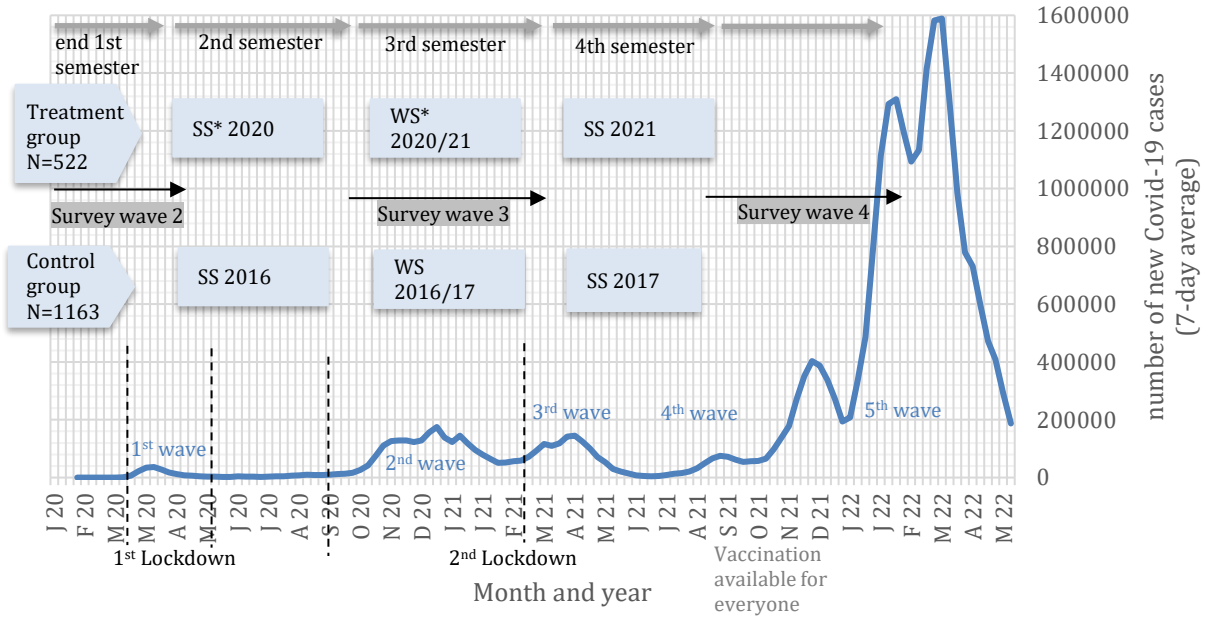
This chapter will give an overview of the Covid-19 situation in Germany during my observation window. The Robert Koch Institute has retrospectively classified the Covid-19 pandemic into distinct waves (Tolksdorf et al., 2022). The initial Covid-19 wave happened from March to May 2020. After a summer with a lower number of new Covid-19 cases the second wave followed from October 2020 to February 2021. The third wave occurred immediately subsequent to the previous one, spanning the period from March 2021 to May 2021. Following a brief period of reduced incidence during the summer months, the fourth wave emerged from August to December, followed by the fifth wave from December 2021 to May 2022. The number of new cases rose sharply during the fifth wave, reaching a peak of 1,600,000.

The Federal Ministry of Health has conducted regular reviews and adaptations of the measures to combat Covid-19. Certain periods during which lockdowns were applied in Germany are notable (Bundesministerium für Gesundheit, 2023). These include the period from March 2020 to May 2020 and the period from October 2020 to March 2021. During these periods, only essential shops were permitted to open. This severely restricted the leisure activities of the general public. In general, there were contact restrictions that were adapted regionally in line with the number of infections (Bundesministerium für Gesundheit, 2023). Universities also largely switched to online teaching for the 2020 summer semester (start in April 2020). For example, 68% of respondents said that all of their courses in the 2020 summer semester would be held digitally, and only a small proportion of 3% said their courses would take place entirely in person (Lörz, Marczuk, et al., 2020). Many universities kept the online classes until the summer semester 2021.

At the outset of the fourth Covid-19 wave, the Ministry of Health declared a national state of emergency. The possibility for individuals over the age of 18 to receive the vaccine was made available in autumn 2021 (Bundesministerium für Gesundheit, 2023). From that point onwards,

numerous regulations were linked to the vaccination status of individuals. A summary of the Covid-19 cases development is presented in Figure 2.

Figure 2: Timeline of new Covid-19 cases (7-day average) in Germany



** SS = summer semester and WS = winter semester*

Source: Bundesministerium für Gesundheit (2023); Tolksdorf et al. (2022); World Health Organization (2023)

3.3 German university students during Covid-19

At the beginning of the 2020 summer semester, the survey "Studieren in Zeiten der Corona-Pandemie" ("Studying in times of the corona pandemic") was conducted in Germany in which approximately 28,000 students from Germany participated (Lörz, Zimmer, et al., 2020). The survey revealed that 74% of students were able to attend all courses (Lörz, Marczuk, et al., 2020). Overall, the majority (86%) reported few or no difficulties in utilising digital teaching resources. Despite their overall satisfaction with the services, only 24% felt adequately prepared for their examinations (Lörz, Marczuk, et al., 2020). There were only marginal differences (no more than three percentage points) between first-year students and advanced students. The survey findings indicate that it became more challenging for students to maintain contact with their peers and engage in collaborative learning (Marczuk et al., 2021).

Furthermore, communication with teachers and participation in learning groups were also affected (Marczuk et al., 2021). There is a growing body of evidence suggesting that social

integration is a crucial factor in academic success (Klein, 2019; Schaeper, 2020). A cognitively activating learning environment is conducive to academic integration (Schaeper, 2020). Contact with teachers is positively related to students' intellectual development (Klein, 2019). During the pandemic, only 41% of students were rather satisfied or very satisfied with the knowledge and skills they had acquired in 2021 (Marczuk et al., 2021). Video conferencing and video recordings are particularly associated with students' satisfaction with the knowledge and skills they have acquired (Marczuk et al., 2021). Video conferencing, in particular, facilitates direct contact with lecturers and fellow students in a digital format.

A significant proportion of students in Germany finance their living expenses through part-time employment (63% as of 2021) (Kroher et al., 2023, p. 84). The financial situation of 37% of employed students was adversely affected by the pandemic, with a loss of employment or a reduction in working hours (Becker & Lörz, 2020). It is important to note that employment nevertheless remained the most common source of funding for studies during the Covid-19 pandemic (Becker & Lörz, 2020).

4 Data

This paper uses data from the National Educational Panel Study for the starting cohort 3 (NEPS Network, 2024a) and the starting cohort 4 (NEPS Network, 2024b) see (Blossfeld & Roßbach, 2019). The NEPS is carried out by the Leibniz Institute for Educational Trajectories (LIfBi, Germany) in cooperation with a nationwide network. The NEPS employs a multi-cohort design, which ensures the provision of high-quality and nationally representative panel data. This data has become a central source for social scientists investigating education-related research questions. This can be seen from the 131 publications in 2023 alone (LifBi, 2024).

The individuals participating in the NEPS study were selected at the outset of the study in 2010 using a stratified multistage sampling design. This entailed the selection of individuals from randomised sample classes at randomised schools, who were then asked whether they wished to participate (Aßmann et al., 2011). The treatment group is comprised of the longitudinal study of starting cohort 3, which commenced in the 2010/11 school year with a sample size of N =

5,208 individuals in Year 5. The number of students in grade 7 was increased to 6,211 in wave 3 of my starting cohort 3 through a refreshment sample. The control group is comprised of starting cohort 4, whose students were in their ninth year of education during the 2010/11 academic year. The cohort commenced with a total of $N = 15{,}017$ individuals. All of the surveys were conducted during a roughly similar time of year. It is important to note that the results of a survey may be subject to seasonal fluctuations (e.g. Kuehnle & Wunder, 2016). Therefore, it is crucial to utilise data from the same period to ensure the reliability of the findings.

The relevant students for the treatment group are those who have graduated from school with an Abitur or a school-leaving qualification that is recognised as equivalent. The majority of these students graduated in 2018. As the majority of this cohort commenced their studies in 2019 and given the intention to analyse the impact of the pandemic, the focus is on students in their first year of university at the time of the outbreak. The group was then reduced to those individuals who were enrolled in the same study programme in all relevant waves and who had no missing values for the dependent variable. After the reduction, I was able to use 522 individuals as my treatment group.

The same sorting procedure was applied to the control group. The majority of individuals in the control group graduated from high school in 2014, and thus the students who commenced university in 2015 were selected as the control group. In total, I was able to include 1,163 individuals with values for my dependent variable. A summary of the case numbers is provided in Table 1.

Table 1: Overview of survey, sample restrictions and case numbers

Data source	*Treatment group*	*Control group*
Survey waves	10, 11 & 12	08, 09 & 10
Interview timing	Wave 10 (1) *: Oct. 2018 – May 2019 Wave 11 (2): Oct. 2019 – April 2020 Wave 12 (3): Sep. 2020 – April 2021	Wave 08 (1): Sep. 2014 – May 2015 Wave 09 (2): Sep. 2015 – May 2016 Wave 10 (3): Sep. 2016 – Aug. 2017
N total in this cohort	5,208	15,017
N that started studying in 2019/2015	644	1256
Lost due to missing values for my dependent variable for my waves	122	93
TOTAL	522	1163

** The number in brackets indicates the number of the wave to which it refers in the analysis.*

Due to the requirement that students must possess the Abitur or an equivalent school-leaving qualification in order to be eligible to study, my data set was significantly reduced in comparison to the original sample size. Subsequently, a specific year was identified for the commencement of the programme, thereby further reducing the sample size. A change of degree programme or dropping out inevitably entails further changes, which is why I have chosen to limit my analysis to students who are enrolled in the same degree programme in both waves. This ensures that students who have changed their subject or stopped studying are excluded from the sample. Consequently, the impact of a change of degree programme or dropout on life satisfaction is excluded.

This paper does not differentiate between the various types of universities and colleges that exist in Germany. Instead, all are analysed together. The table 1 shows which waves we used from the data set for which group. For my analysis, wave 1 (wave 10 and 8 in the data set) corresponds to the wave before individuals started their studies. In wave 2, the individuals are in their first year at university and in wave 3 the individuals are in their second year at university.

In order to contextualise the data, I have designated wave 1 and 2 as pre-covid. This is because the majority of the survey period of wave 2 occurred prior to the onset of the pandemic. It is possible that some individuals completed the questionnaire during the period of the pandemic until April 2020, but unfortunately, the precise timing is not clear.

My study is focusing on the three waves of data, as the interest lies in individuals who have completed their secondary education. Concurrently, completion of the survey is optional in each year. If I were to include further waves, my data set would be further reduced leading to an even smaller data set. To prevent my data sample from becoming too small, I only chose the years after leaving school. Furthermore, the limitation to students in their first year of study has resulted in an even more restricted data set.

My outcome variable “life satisfaction” is a key indicator of subjective well-being (Alderson & Katz-Gerro, 2016). It is also the most common measure of the overall cognitive assessment of the quality of one's life (Diener, 2009). In young people, lower life satisfaction correlates with a wide range of negative social and psychological outcomes, including academic failure, emotional disturbance, violent behaviour, substance abuse and suicide (Proctor et al., 2009). In the survey, individuals were asked the following question, upon whose responses my analysis

insists: "How satisfied are you currently with your life in general?" Respondents answered on a scale from 0 ("completely dissatisfied") to 10 ("completely satisfied"). Life satisfaction was assessed across all waves and cohorts using the same measurement tool.

4.1 Effect heterogeneity

Since inequalities have seen to be widening throughout the pandemic (Altmejd et al., 2023; Czymara et al., 2021; Major et al., 2020), it is important to examine the heterogeneity of treatment effects according to gender (female/male), migration background and parental education. An individual is considered to have a migration background as soon as they themselves or one of their parents were not born in Germany. This definition is derived from Neugebauer et al. (2023), who conducted a similar study on a different group of individuals. In regard to the educational background of the parents, the study distinguishes between two groups: individuals with at least one parent who holds a degree from a university, and those who do not have a university-educated parent.

Table 2 presents the distribution of the various demographic characteristics of the individuals included in the data set. The two cohorts exhibit a high degree of similarity. It is regrettable that the control group lacks a little more missing data on gender, migration background and parental education than the treatment group. In general, the distributions in my data are comparable to the actual distributions observed at all universities in Germany (see Table 3). It should be noted that the definition of ‘migration background’ differs slightly between the data for all German universities and my study (see Table 3). Nevertheless, due to the availability of data, it is not possible to equate the definitions.

The control group exhibits 11% unspecified data for the dummy variable of parental education (Table 2). Upon closer examination of the data, it becomes evident that the reason for the absence of information is due to the fact that one parent lacks the requisite data, either because it is missing or not known. Consequently, the dummy variable becomes NA. In the event that one parent does not have the required data, the educational qualification of the other parent is 96.94% not a university degree.

Table 2: Distribution of dummy variables gender, migration background and parental education

		Treatment Group	*Control Group*
Gender	*1 = male*	44.8%	43.5%
	0 = female	55.2%	53.2%
	NA	0%	3.3%
*Migration background**	*1 = yes*	18.6%	18.1%
	0 = no	79.9%	78.9%
	NA	1.5	3.0%
*Parental education **	*1 = yes*	*55.9%*	*52.0%*
	0 = no	*44.1%*	*36.7%*
	NA	*0%*	*11.3%*

** Either the individuals or at least one parent was born outside of Germany.*

*** At least one parent graduated from university.*

Source: Own calculations from the used data

Table 3: Distribution of new students at German universities in regard of gender and migration background

		*WS 2019/20 (2021) **	*WS 2015/16 (2016)*
Gender	male	48.39%	50.05%
	female	51.61%	49.95%
*Migration background***	yes	21.25%	19.68%
	no	78.75%	80.32%
Parental education	yes	52%	56%
	no	48%	44%

** The years in brackets describe the time of observation for parental education. Gender and migration background are observed for the winter semester while parental education is observed for a calendar year. I chose the times that are closest to my observations.*

*** In accordance with the Federal Statistical Office, all individuals who do not possess German citizenship are considered foreigners. Consequently, their definition differs from that employed in the sample. (Statistisches Bundesamt, 2024a).*

Source: Statistisches Bundesamt (2024c), Kroher et al. (2023)

5 Methods

A difference-in-difference design (DiD) is employed to estimate the effects of the Covid-19 pandemic on changes in life satisfaction nearly one year after the outbreak of Covid-19. The DiD enables the observation of changes in within-person satisfaction for individuals in one group with the pandemic and individuals in another group without the influence of the Covid-19 pandemic. The data originates from a study with a comparable structure, thus ensuring that the available variables have the same interpretation. As the waves preceding the onset of the pandemic exhibited a parallel trend, the parallel trend assumption is validated in Figure 3 (see Results section).

The following equation represents the design of the study.

$$Y_{it} = \beta_1 TG_i + \beta_2 Time_t + \beta_3 (TG_i Time_t) + \varepsilon_{it}$$

In this study, the variable of interest is life satisfaction, Y_{it} of individual i at time t. The first coefficient, β_1, describes the level differences in the outcome between the treatment and control group. β_2 describes the temporal difference in life satisfaction between before and after the onset of Covid-19. β_3 describes the effect of interest resulting from the interaction of the treatment group indicator TG_i with the time indicator $Time_t$. In order to account for unobserved heterogeneity, random effects were employed. Additionally, the study aims to analyse the heterogeneity of treatment effects by gender, migration background and parental education.

This type of model allows for the analysis of the effect of Covid-19 on the treatment group, while also enabling the comparison with the control group. It provides the opportunity for the exclusion of potential natural fluctuations in life satisfaction following the natural U-shaped development of well-being over the course of a person's life cycle (Blanchflower, 2021). This enables a comprehensive analysis of the impact of the Covid-19 pandemic on life satisfaction. Furthermore, the change in well-being can be observed not only during the initial phase of the pandemic in Germany, but also in the subsequent period. My study extends beyond the initial phase of the pandemic in Germany, and also includes a comparison with first-year students who commenced their studies without the influence of Covid-19.

5.1 More detailed analysis of the treatment group

In the final section of the results, I will examine the survey data from the outset of the pandemic for my treatment group, conducted in May 2020, and will therefore analyse how their life satisfaction evolved between waves 2 and 3 and add one additional wave 4 to have the development for one more year. As there is no comparable data for the Covid-19 wave and wave 4 for the control group, the development is presented separately and without a DiD analysis.

Table 4 provides an overview of the waves. It should be noted that only 457 of the individuals in the sample completed the survey for wave 4 and only 176 individuals completed the survey for the Covid-19 wave (2.5). The fact that there are fewer individuals in wave 4 than in wave 3 represents the normal development of the cohort, whereby the number of individuals in each successive wave is slightly lower. The low response rate of 176 individuals out of 522 in the May 2020 survey can be attributed to the fact that such a survey was unlikely to have been a priority for the respondents at that time. Another potential explanation for the low number of participants in the wave at the start of the Covid-19 pandemic is that the Covid-19 pandemic survey is based on a total of 100,000 individuals from all six starting cohorts of the NEPS. It is unclear whether all individuals from the original starting cohort received the survey. However, a total of 1,031 individuals from the starting cohort of my treatment group completed the Covid-19 surveys in May 2020, 176 of whom were in my sample.

Table 4: Overview of extra waves for the treatment group

	*Wave 13 (4) **	*Covid-19 wave (2.5)*
Interview timing	Oct. 2021 – May 2022	May 2020
N out of my treatment group sample (N = 522)	457	176

* Wave 13 is the original one in the data set. In my analysis this wave will be referred to as wave 4. The wave at the beginning of Covid-19 will be referred to as wave 2.5.

It is possible that some individuals completed the questionnaire for wave 2 simultaneously to the Covid-19 questionnaire, but unfortunately, the precise timing is not clear. The presentation of the differences in the responses provides an indication of the degree of similarity or difference between the second wave and the wave conducted at the beginning of the pandemic in terms of the information provided. It can be reasonably assumed that the information

provided will be relatively similar if a significant number of individuals completed both questionnaires at the same time.

In the initial survey conducted at the onset of the pandemic (referred to here as wave 2.5), respondents were queried regarding the impact of Covid-19 on various aspects of their lives. In order to ascertain the factors that influenced life satisfaction at the onset of the pandemic, the survey data will be used with regard to the following variables: whether respondents had to extend their studies, whether they experienced financial difficulties, whether they felt lonely and whether they felt restricted in their standard of living. An overview of all the variables used in this paper and definitions thereof is shown in Table 12 in the appendix.

As satisfaction with the chosen educational path is a factor in overall life satisfaction (Sandner et al., 2023), I will also examine how satisfaction with the degree programme has evolved over the first year of studying. A comparison of the data between the treatment and control groups is being conducted. However, a difference-in-differences (DiD) design cannot be implemented, as the data on satisfaction with the degree programme cannot be subjected to a DiD analysis, due to the limited number of available data sets and the inability to control for parallel trends. Consequently, this will only be a comparative presentation of the development.

6 Results

The following chapter presents the results of my analysis. Firstly, the results of the general model are presented, followed by a breakdown of the results into subgroups. Subsequently, I provide a more detailed examination of the treatment group, examining their change in life satisfaction over a greater number of survey waves than were available for use in the DiD analysis. Finally, I examine the direct consequences to their studies, loneliness and financial of the Covid-19 pandemic on the individuals in my treatment group with regard situation.

6.1 Empirical results

Figure 3 presents the mean life satisfaction for the treatment group and the control group. On the one hand, the parallel trend can be observed prior to the onset of the Covid-19 pandemic. Both the treatment group and the control group exhibited a slight increase before the pandemic (wave 1 to wave 2). This indicates that the parallel trend assumption before the treatment for a DiD analysis is met. The treatment group demonstrated a 0.008-scale point stronger increase in mean life satisfaction than the control group.

It can be observed that the mean life satisfaction score for the control group has increased slightly, whereas it has declined by 0.387 scale points for the treatment group, after the start of Covid-19 (from wave 2 to wave 3). In wave 3 the treatment group exhibited a mean life satisfaction score that was 0.4 scale points lower than that of the control group. The general model in Table 5 indicates that the negative impact of the Covid-19 pandemic on life satisfaction in the treatment group is statistically significant. This implies that life satisfaction has decreased significantly as a consequence of the pandemic. The table also includes the analysis for my subgroups that I will talk about in the text subchapter. Table 13 in the appendix is showing the different mean life satisfaction of the groups for the different survey waves.

Figure 3: Development of mean life satisfaction by cohort

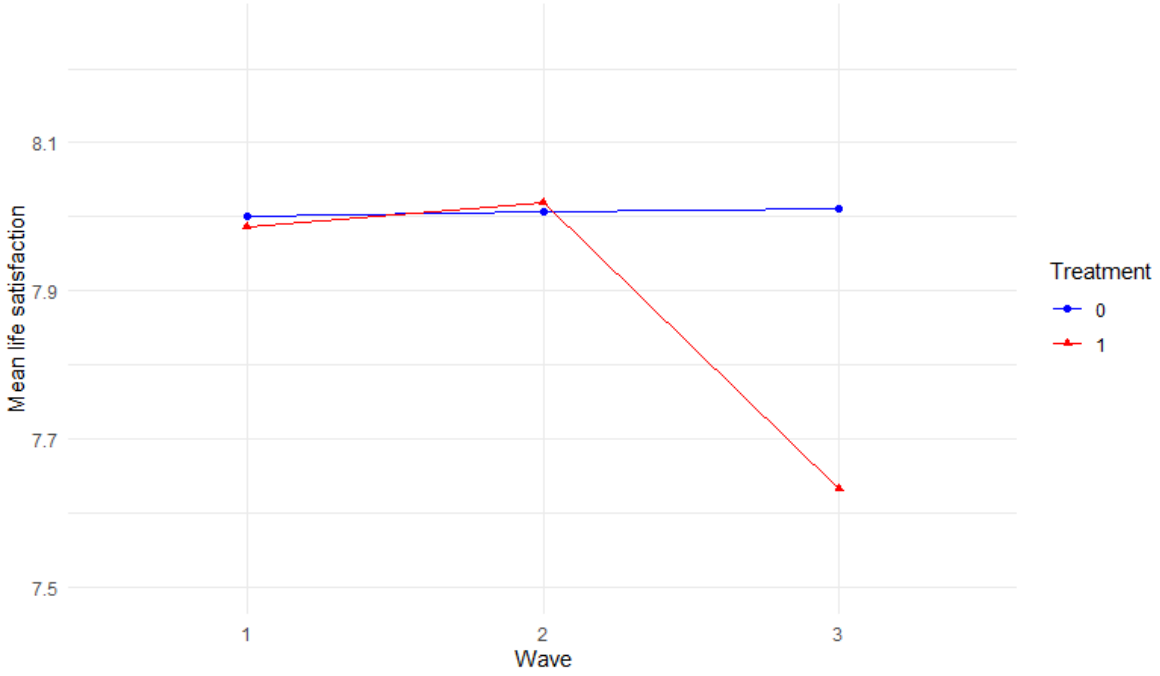


Table 5: Regression table of analysis with random effects

	General	[95% conf. interval]	Gender	[95% conf. interval]	Migration back-ground	[95% conf. interval]	Parental education	[95% conf. interval]
Time	0.007 (0.028)	[-0.048; 0.063]	0.076 (0.039)	[-0.00; 0.152]	0.012 (0.032)	[-0.051; 0.075]	0.033 (0.047)	[-0.059; 0.124]
Treatment	-0.000 (0.046)	[-0.093; 0.091]	0.002 (0.069)	-0.123; 0.127]	0.005 (0.053)	[-0.098; 0.109]	-0.067 (0.073)	[-0.21; 0.076]
Interaction term: time and treatment	-0.388 *** (0.053)	[-0.478; -0.278]	-0.394 *** (0.069)	[-0.529; -0.12]	-0.408*** (0.058)	[-0.52; -0.296]	-0.372*** (0.079)	[-0.527; -0.217]
Dummy for gender (ref. female)			-0.145 (0.053)	[-0.038; 0.171]				
Interaction term: time and gender			-0.145 * (0.058)	[-0.258; -0.031]				
Interaction term: gender and treatment			-0.017 (0.095)	[-0.204; 0.169]				
Triple interaction: time, treatment, gender			0.027 (0.103)	[-0.175; 0.229]				
Dummy for migration background (ref. no. mig. backg.)					0.013 (0.068)	[-0.121; 0.146]		
Interaction term: time and mig. backg.					-0.007 (0.074)	[-0.152; 0.138]		
Interaction term: migration background and treatment					-0.091 (0.122)	[-0.33; 0.147]		
Triple interaction: time, treatment, migration background					0.140 (0.132)	[-0.119; 0.399]		
Dummy for parental education (ref. no par. w. uni. edu.)							-0.065 (0.056)	[-0.175; 0.046]
Interaction term: time and parental education							-0.034 (0.061)	[-0.088; 0.291]
Interaction term: parental education and treatment							0.101 (0.105)	[-0.228; 0.183]
Triple interaction: time, treatment, parental education								
constant	8.004 *** (0.043)	[7.953; 8.055]	7.989 *** (0.036)	[7.904; 8.07]	8.001 *** (0.029)	[7.949; 8.064]	8.04*** (0.043)	[7.964; 8.134]
***N* observation**	5055		4941		4926		4662	
***N* individuals**	1685		1647		1642		1554	
R^2 within	0,0223		0.0252		0.0229		0.0244	
Prob > chi^2	0		0		0		0	

Note: Model includes individual random-effects, Robust Standard errors in parentheses.
**** p<0.001, ** p <0.01, * p<0.05, $^+$ p<0.1*

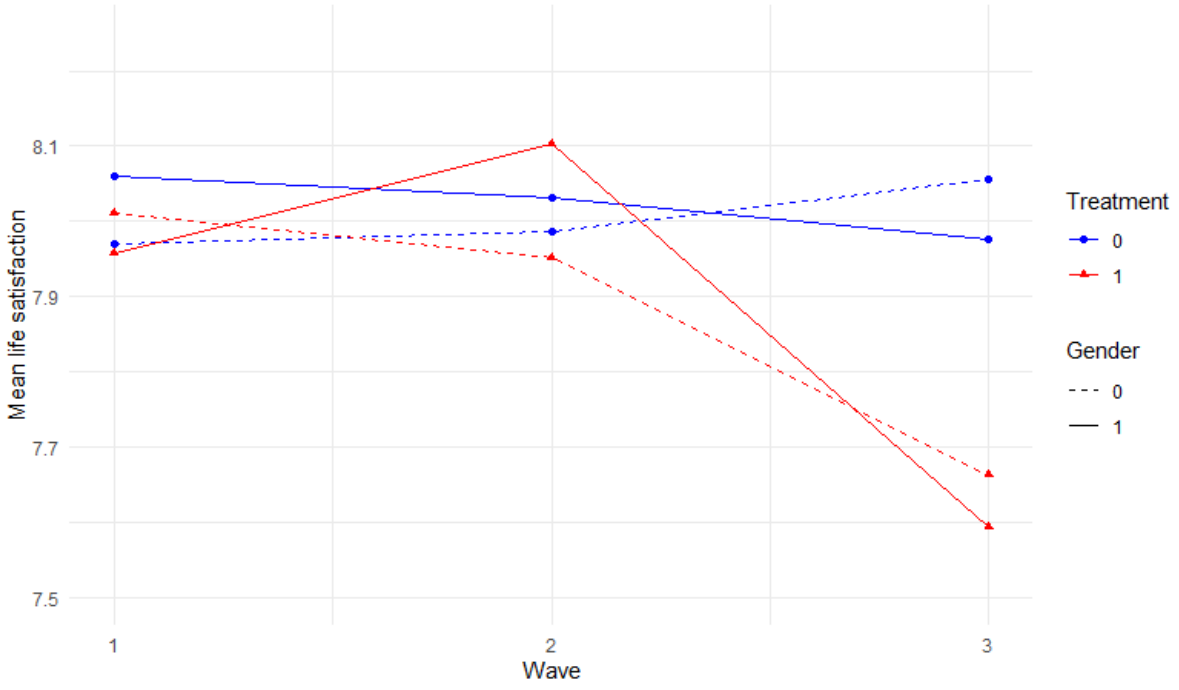
6.1.1 Results for subgroups

Gender

Figure 4 shows that life satisfaction is 0.069 scale points lower for men than for women after the treatment, regardless of whether the individuals are in the treatment or the control group. The decline in life satisfaction observed in the treatment group was 0.221 scale points greater for men than for women. On average, men experienced a decline of 0.509 scale points from wave 2 to wave 3, while women only experienced a decline of 0.288 scale points. The 5% significant coefficient of time and treatment indicates that the effects of the Covid-19 pandemic on men were statistically significantly more negative than for women (Table 5).

It is noteworthy that there was no discernible trend for the genders prior to the pandemic, and that their respective groups exhibited divergent trajectories. For the treatment group, life satisfaction before the pandemic increased for women and decreased for men. The opposite was true for the control group. Following the pandemic, there was a decline in life satisfaction for both genders in the treatment group, with a more pronounced decrease observed among men (Figure 4).

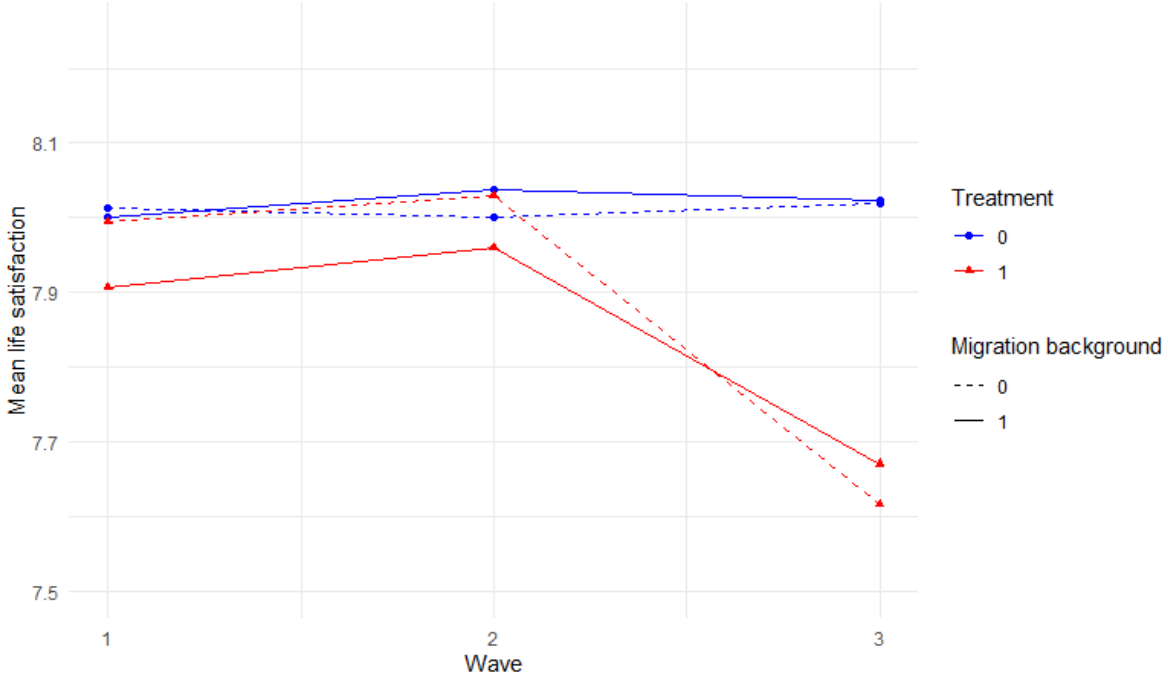
Figure 4: Development of mean life satisfaction by cohort and gender



Migration background

Figure 5 presents the evolution of the average life satisfaction of the treatment and control groups for students with and without a migration background. Overall, the individuals with migration background have a lower life satisfaction after finishing school than the people without migration background in the same cohort. In the treatment group, it can be observed that individuals with a migration background exhibited lower levels of life satisfaction prior to the pandemic than those without a migration background. Nevertheless, during the pandemic, there was a more pronounced decline in life satisfaction among people without migration background. The life satisfaction of students without a migration background has decreased by 0.413 scale points, while the life satisfaction of students with a migration background has decreased by 0.2889 scale points. Nevertheless, the analysis indicates that the change in life satisfaction is not statistically significantly dependent on whether someone has a migration background or not (Table 5). The control group demonstrated a slight reduction in the life satisfaction of migrants in the third wave compared to the second one, while the life satisfaction of people without migration background slightly increased during the same period.

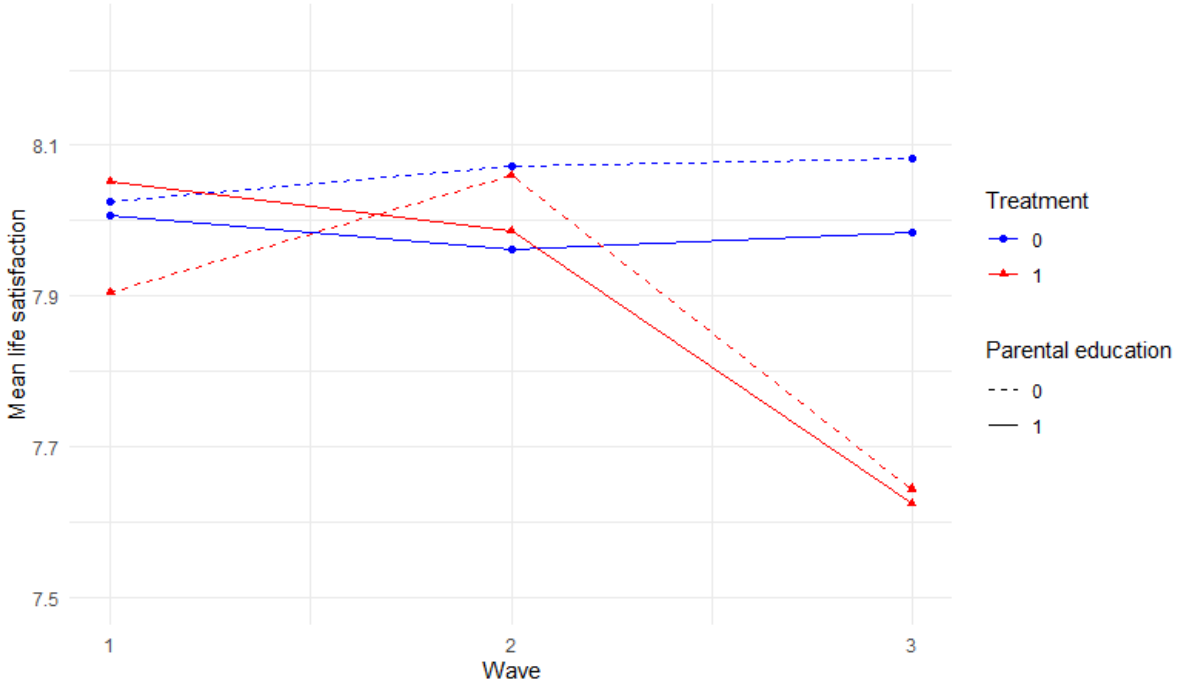
Figure 5: Development of mean life satisfaction by cohort and migration background



Parental education

Table 6 presents the evolution of the mean life satisfaction of the treatment and control groups of students whose parents hold university degrees and those whose parents do not. Both the individuals from the treatment group and the control group, with parents with a university degree, exhibited a decline in life satisfaction between the time of leaving school and the commencement of university studies. Conversely, individuals with parents who did not attend university demonstrated an increase in their life satisfaction. Following the onset of the Covid-19 pandemic, both students with parents who hold a university degree and individuals with parents who lack such qualifications exhibited a decline in their life satisfaction. However, the decline was only marginal, with a 0.055 scale points stronger decline for students with parents that do not have a university degree. The control group exhibited minimal change in life satisfaction for both subgroups following the commencement of their studies. Nevertheless, the analysis indicates that this change in life satisfaction is not statistically significantly dependent on the educational qualifications of the parents (Table 5).

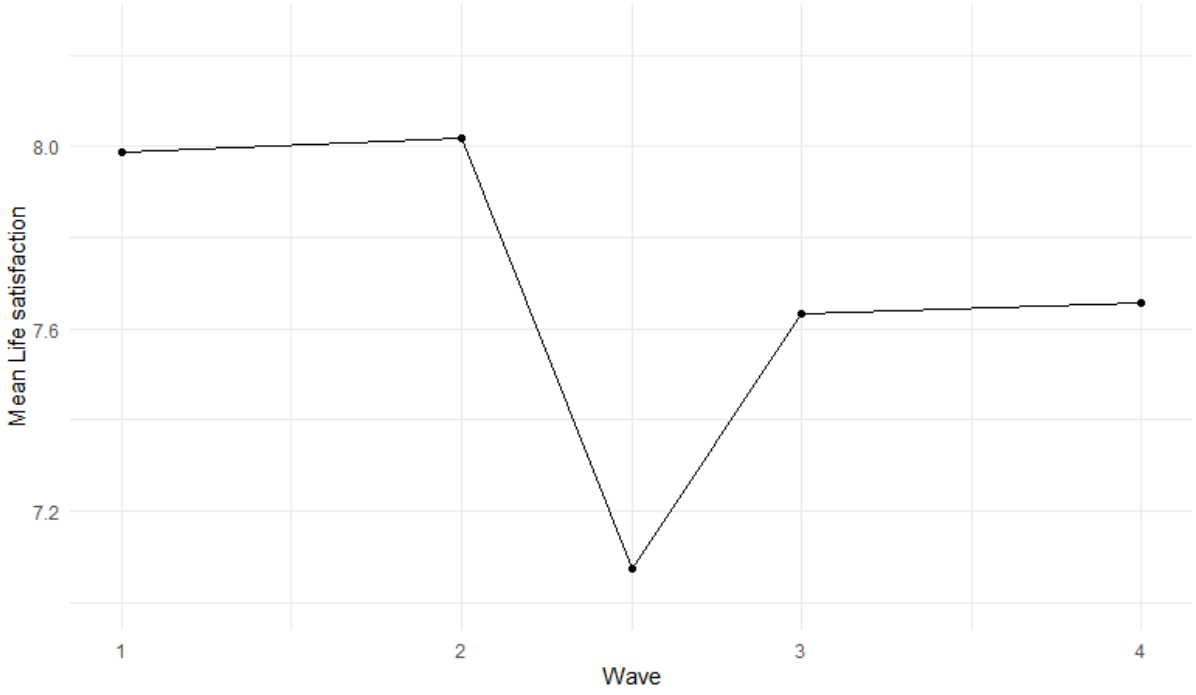
Figure 6: Development of mean life satisfaction by cohort and parental education



6.2 Detailed descriptive analysis for the treatment group

In order to gain a more detailed understanding of the assessments of life satisfaction during the early stages of the Covid-19 pandemic, I incorporated the Covid-19 survey from NEPS as wave 2.5. Regrettably, there is no comparable wave in my control group, which precludes the ability to make DiD for these two groups. Consequently, this data can only serve to provide an impression of how the assessment of life satisfaction has evolved for the treatment group (Figure 7). Furthermore, an additional wave was incorporated, spanning the survey period from October 2021 to May 2022 (wave 4). This additional wave was also included in the graph. Comparable data for the control group is also lacking for that wave.

Figure 7: Life satisfaction adding Covid-19 wave and one extra wave in winter 2021/22



The graph illustrates that life satisfaction reached its nadir at the onset of the pandemic and subsequently exhibited a gradual upward trend. Initially, there was a decline in life satisfaction of 0.945 scale points between waves 2 and wave 2.5. However, there was a subsequent increase of 0.558 scale points for wave 3 and a modest increase of 0.027 scale points was observed between waves 3 and 4.

The first wave of the pandemic occurred at the beginning of the 2020 summer semester in Germany (April/May 2020). The survey for wave 2.5 was conducted in May 2020. The

simultaneous occurrence of these two events may provide an explanation for the very low level of life satisfaction. One potential contributing factor is uncertainty about the course of the semester. Wave 3 of the survey happened around nine months after the onset and during the second Covid-19 wave according to Tolksdorf et al. (2022). Although the fourth and fifth waves of the Covid-19 pandemic occurred during the period of data collection for survey wave 4, there was a slight increase in life satisfaction.

6.2.1 Covid-19 related variables

A multitude of factors influence overall life satisfaction. Consequently, in this chapter, I will examine the impact of the Covid-19 pandemic on various aspects of life, including the perception of limitations on living standards, the necessity to delay studies due to university closures, feelings of loneliness, financial difficulties, and satisfaction with their studies. I will examine waves three and four of the treatment group. It is unfortunate that these consequences were not surveyed prior to the outbreak of the pandemic, thus preventing a comparison with pre-pandemic data. The following tables show the respective distributions.

Limitations of standard of living

Given the established link between life satisfaction and living conditions (Herke et al., 2019), I examine how the perceived limitations of living standards changed for the treatment group throughout the course of the pandemic. Table 5 illustrates that in both wave 3 and wave 4, over 40% of individuals perceived their standard of living to be (hardly) unhindered. In wave 3, 27.59% of individuals reported experiencing severe or very severe limitation of their standard of living. This number decreased slightly in wave 4 to 24.29%.

Table 5: Limitations of standard of living

	1 = not at all	*2 = hardly*	*3 = moderately*	*4 = strongly*	*5 = very strongly*
Wave 3	11.49%	32.57%	28.35%	22.03%	5.56%
Wave 4	12.04%	30.85%	32.82%	18.6%	5.69%

Necessity to delay studies

As a consequence of the temporary closure of universities and the transition to online learning for approximately three semesters, individuals in waves 3 and 4 were asked whether the closure of the university would lead to an extension of their studies (Table 6). The data indicates that over 40% of respondents did not perceive this to be the case, and 20% in wave 3 (or 14% in wave 4) did rather no perceive it. The proportion of individuals who responded affirmatively to this question increased by 4.95 percentage points from wave 3 to wave 4. Additionally, the proportion of individuals who responded in a manner that could be considered somewhat affirmative also increased by 2.31 percentage points.

Table 6: Necessity to delay studies

	1 = does not apply at all	*2 = does rather not apply*	*3 = does party apply*	*4 = does rather apply*	*5 = does completely apply*	*No answer*
Wave 3	45.79%	19.92%	12.07%	11.69%	8.62%	1.53%
Wave 4	43.11%	14.44%	8.75%	14.00%	13.57%	6.13%

Feeling of loneliness

The individual experience of loneliness is also associated with an individual's satisfaction with their life. The data indicates that approximately 50% of the individuals in the treatment group did not experience feelings of loneliness at all or only to a slight extent in waves 3 and 4 (Table 7). A slight tendency towards a stronger feeling of loneliness can be observed. The proportion of individuals who indicated that they did not feel lonely at all or only slightly lonely has increased, while the proportion who indicated that they felt very strongly has increased by 1.64 percentage points.

Table 7: Feeling of loneliness

	1 = not at all	2 = hardly	3 = moderately	4 = strongly	5 = very strongly
Wave 3	22.8%	28.35%	29.50%	17.05%	2.3%
Wave 4	16.63%	34.57%	28.45%	16.41%	3.94%

The fact that just under 50% of respondents indicated that they experienced minimal, or no feelings of loneliness may be related to their housing situation. Although there were limitations on social interaction and work/study, the majority of individuals did not live alone (Table 8).

Those residing in households comprising more individuals were afforded the possibility of maintaining social interactions in their own homes. In some instances, respondents indicated that they resided in households comprising up to 15 individuals.

Table 8: Number of people living in one household

	1	*2*	*3*	*4*	*> 4*
Wave 2	26.44%	14.37%	25.67%	21.84%	11.69%
Wave 3	25.86%	15.33%	23.18%	24.33%	11.30%
Wave 4	28.01%	20.39%	24.78%	19.3%	7.46%

Money problems

It can be posited that financial concerns may also contribute to a reduction in overall life satisfaction. A common approach to financing one's studies is to hold a job while pursuing an education (Lörz, Zimmer, et al., 2020). In the treatment group, the number of students with a part-time job has increased over course of the survey (Table 9). The most notable increase can be observed between waves 1 and 2, during which individuals transitioned from a gap year to university.

Table 9: Percentage of students with and without a job

	Wave 1	*Wave 2*	*Wave 3*	*Wave 4*
Has a job	8.81%	46.36%	50.96%	64.33%
Has no job	91.19%	53.64%	49.04%	35.67%

Overall, it can be observed that financial concerns played a relatively minor role in the treatment group (Table 10). This may be attributed to the fact that only a select few of the individuals in my treatment group were placed on short-time work or released from work without receiving a salary (Table 11). Short-time work is a method by which the employment agency assumes partial responsibility for the wage costs of employees (Bundesministerium für Arbeit und Soziales, 2023). This relieves the employer of the costs associated with employing workers, thereby reducing the likelihood of redundancies. A short-time working allowance may be applied for in the event of a reduction in working hours due to economic reasons or unavoidable circumstances. During the Covid-19 pandemic, the application process for short-time working allowance was streamlined (Bundesministerium für Arbeit und Soziales, 2023).

Table 10: Money problems

	1 = not at all	*2 = hardly*	*3 = moderately*	*4 = strongly*	*5 = very strongly*
Wave 3	67.43%	22.61%	7.09%	2.68%	0.19%
Wave 4	57.33%	35.01%	6.13%	1.09%	0.44%

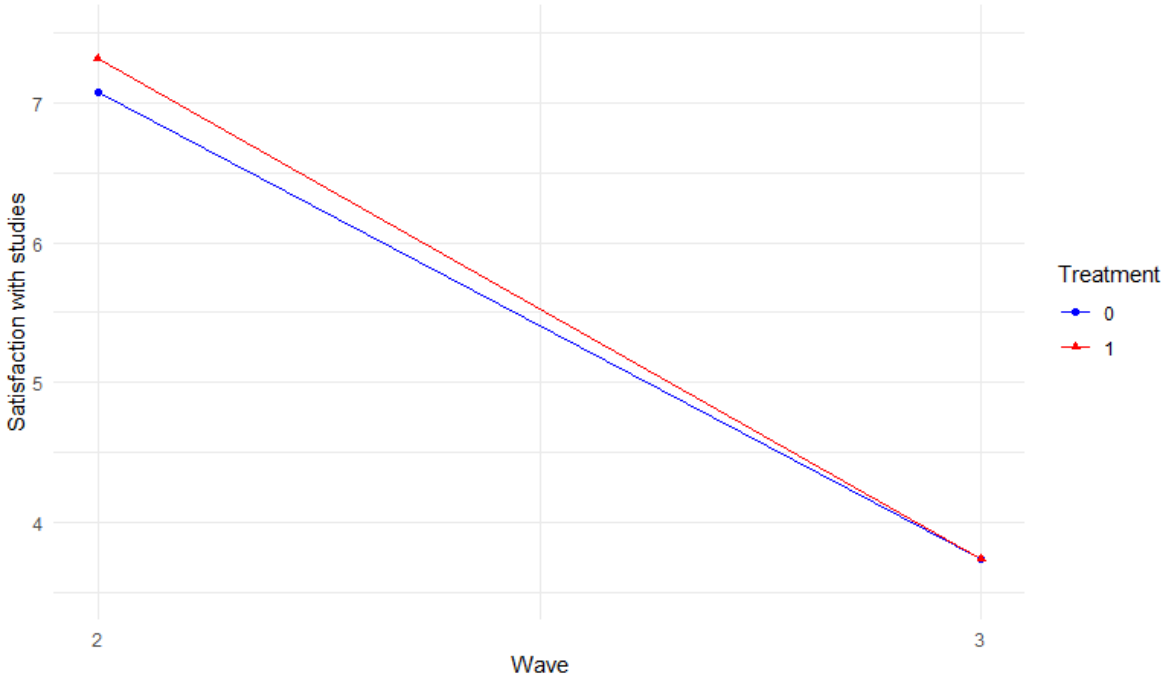
Table 11: Affectedness short-time work/ unpaid leave

	Short-time work	*Leave without pay*	*None of it*	*No answer*
Wave 3	1.5%	4.14%	93.23%	1.13%
Wave 4	1.02%	2.04%	94.22%	2.72%

Satisfaction with their studies

The two groups demonstrated a comparable pattern of satisfaction with their studies between waves 2 and 3. Although satisfaction with the chosen educational and career path plays a role in overall life satisfaction (Sandner et al., 2023), it does not appear to be a decisive factor in the reduction in life satisfaction observed in the treatment group, as the control group shows a similar development in satisfaction with their studies (Figure 8), but only a slightly smaller change in overall life satisfaction (see Figure 3).

Figure 8: Satisfaction with studies



7 Discussion

The objective of this paper is to gain a more comprehensive understanding of the impact of the Covid-19 pandemic on the life satisfaction of students in Germany. In order to achieve this objective, this paper utilises data from the NEPS database for university students in starting cohort 3 and 4, which it then compares with each other. This thesis also examines whether there are differences in the impact of the pandemic on the life satisfaction of individuals based on their gender, migration background or parental education. This section will initially address well-being during the Covid-19 pandemic and then consider the broader context of well-being and student life. It serves to situate my findings within the ongoing debate about the impact of the Covid-19 pandemic on people's lives.

7.1 Effect of Covid-19 on life satisfaction

The results of this study indicate that the Covid-19 pandemic, which started in 2020 had a significant negative impact on life satisfaction. My hypothesis 1 "*I expect a decline in life satisfaction of the students affected by the pandemic. I expect only a minor fluctuation in the life satisfaction of the students not affected by the pandemic."* has been proven with my analysis. The life satisfaction of students has declined more steeply than that of the general population. In January and February 2021, the life satisfaction of the general population exhibited a decline of 0.24 scale points compared to pre-pandemic levels in 2019, whereas the life satisfaction of students showed a decline of 0.39 scale points in the same period (Entringer and Kröger (2021). The survey employed the same scale as the survey that I used. Overall, student satisfaction remains slightly higher (7.63) than that of the general population (7.43) in the winter of 2020/2021 (Entringer & Kröger, 2021, p. 16). Although young adults have a lower risk of contracting Covid-19, the closure of educational institutions, social distancing and the stay-at-home order may have had an adverse effect on social life, ultimately leading to a decline in life satisfaction. (Preetz et al., 2021). It is crucial to maintain ongoing observation of this development, as a persistently low level of life satisfaction is associated with a decline in mental health (Fergusson et al., 2015).

My hypothesis 2 *"I expect a more pronounced decline in life satisfaction during the Covid-19 pandemic for women, students with migration background and students with less educated parents."* did not have the support of evidence. The findings of this study indicate that migration background or parents' educational qualifications have no statistically significant influence on the change in life satisfaction during the pandemic. This is consistent with the results of previous studies. For instance, Neugebauer et al. (2023) found no influence of these two inequalities among school leavers in Germany, while (Major et al., 2020) also found a similar non-statistically significant development for English students.

In contrast, the results for the subgroup of gender differ greatly from the existing studies. While the majority of studies indicate that the impact of the Covid-19 pandemic on life satisfaction is more pronounced among women, my findings suggest that the pandemic has a more significant effect on men's life satisfaction. One potential explanation for the observed low life satisfaction in wave 2 for women is that women may have completed the survey towards the end of the survey period of wave 2, thereby already being influenced by the pandemic. Consequently, their level of life satisfaction may have been already lower in wave 2, resulting in a smaller decline in wave 3. Further studies utilising the same data set are required to elucidate this fact.

7.2 More detailed development of life satisfaction of the treatment group

By the winter of 2021/22, the average level of life satisfaction had not yet reached the pre-pandemic level. My hypothesis 3 "*I expect that life satisfaction did not recover to the pre-Covid-19 level in the winter 2021/22."* is therefore fulfilled. However, life satisfaction was on the mend and had improved between winter 2020/21 and winter 2021/22. In contrast to the findings of the comprehensive survey of the entire population, the initial decline in life satisfaction observed during the first wave of the pandemic (survey wave 2.5) was particularly pronounced (Entringer & Kröger, 2021).

Concurrently, Figure 2 illustrates that the number of newly infected individuals increased significantly during the survey period of wave 4 in comparison to previous times. This shows that the survey of wave 4 was still strongly influenced by Covid-19. Despite the ongoing pandemic, it can be observed that life satisfaction is gradually recovering. This may be attributed to the fact that individuals have become accustomed to the situation and that

vaccinations for all individuals aged 18 and above were available throughout the survey period of wave 4, giving a feeling of safety. Especially young people tend to recover relatively quickly after the restrictions are removed and return to their original well-being level (Lucas, 2007). The slight increase in life satisfaction of my treatment group from winter 2020/21 to winter 2021/22 shows the same trend as 16 to 25-year olds in the UK (Henseke et al., 2022) and students in Germany (Neugebauer et al., 2023). To the best of my knowledge, no studies have been conducted that demonstrate a contrary trend.

7.3 Other Covid-19 and life satisfaction related developments

Approximately 50% of the students in the sample reported no or only slight feelings of loneliness, although a negative trend was observed between wave 3 and wave 4. A significant conclusion from this study is that feelings of loneliness do not dissipate rapidly. Loneliness has been demonstrated to have a negative effect on the health of individuals. Unfortunately, it is not possible to examine the change between waves 1,2 and 3, as no data is available for wave 1 and 2. The question regarding loneliness was only included in the survey in May 2020, following the introduction of the Covid-19 survey. Although only approximately 50% of respondents reported experiencing moderate to strong feelings of loneliness, these feelings warrant serious consideration and the creation of opportunities to manage them. Loneliness has a profound impact on mental health and general well-being (Park et al., 2020). It is of paramount importance to implement measures to minimise feelings of loneliness among students in order to promote mental health (Weber et al., 2022). It is recommended that universities provide adequate adapted support to minimise the impact of the Covid-19 pandemic on mental health (Weber et al., 2022).

It is of interest to analyse the role of the number of household members in the experience of loneliness. In Germany, a significant proportion of students have returned to their parental homes, continued to reside with their parents, or have shared accommodation with other students (Hübsch, 2023). Consequently, they were not completely isolated even during the lockdowns. This could be one explanation why only approximately 17% of respondents indicated that they had experienced feelings of loneliness, while only 2% reported experiencing a very strong feeling of loneliness. In order to provide information for the development of

effective support strategies, it would be beneficial to conduct further studies investigating the long-term development of loneliness and mental health and strategies that are already in place.

Although the study “Studieren in Zeiten der Corona-Pandemie” had a similar proportion of students with a job during their studies, significantly fewer students in my survey stated that they had money problems and were laid off, in short-time work or without pay. Students from lower income backgrounds were particularly affected by the lockdowns (Major et al., 2020). The finding that only 10% of the individuals in my sample had moderate to severe money problems challenges my hypothesis 4 “*I expect that the feeling of limitation of the standard of living is going up, that individuals have to delay their studies, that the feeling of loneliness is high during the pandemic and that the individuals report money problems*.”. Especially noting that there was an increased inflation rate following the onset of the Covid-19 pandemic, which may have affected life satisfaction through a change in the financial situation.

One potential explanation is that my survey included a smaller number of respondents than that of Lörz, Zimmer, et al. (2020). Additionally, my selection of the original sample excluded individuals who did not respond to the question on life satisfaction in all three waves. It is possible that individuals with severe money problems completed less of wave 3 because they had other priorities. Another possible explanation is that although approximately the same number of students worked alongside their studies as in the survey by Lörz, Zimmer, et al. (2020), they were able to quickly minimise their money problems during the Covid-19 pandemic by relying on other financing options through family and emergency aid from the government. In future studies, it would be beneficial to examine household income and the financing of individuals' studies in greater detail, with a particular focus on the relationship between these factors and money problems during the Covid-19 pandemic.

7.4 Limitations and further research

As there is a small difference in the distribution of the subgroups between my treatment and control groups, it is possible that the estimates of my DiD analysis are biased. In order to check this, it would be useful to perform the analysis with a balanced sample in an additional paper. It is regrettable that I am unable to include data for my control group for the period corresponding to that of wave 4 and the Covid-19 wave in my treatment group. The reasons for the missing survey year, corresponding to wave4, in the control group survey are unknown.

Unfortunately, this missing wave meant that I could not extend my DiD analysis by another year. However, I have decided to show the development for my treatment group in detail anyway. Although it does not provide statistical results, it does give a more precise understanding of the development of life satisfaction among students in Germany.

It should be noted that not all of the 522 individuals in my DiD analysis completed the survey at the beginning of Covid-19 or the subsequent wave 4. The missing individuals can lead to a distorted picture of development and should therefore be taken into account when looking at the results. The reasons why individuals did not complete the survey are unclear. Missing information may have led to selection of individuals, but this is only a assumption. However, since the 522 students in my survey roughly represent the distribution of subgroups at German universities, it can be assumed that the selection represents the subgroups.

This study focuses on students of all types, but it would be interesting to investigate in a further study whether and in what way the effects of Covid-19 on life satisfaction differ for students in different types of study and study programmes. It would also be interesting to see what the situation is for people in vocational training, as they are also still in education, but may have different qualifications and the way they work differs greatly from studying at university. I focused only on students at the beginning of their studies, but it would be interesting to analyse the development of university students at the end of their studies as they might face different challenges, e.g. in regards of search for work. It would also be interesting to see how life satisfaction developed for students who had no experience of studying before Covid-19. The students in my treatment group were able to study normally for almost a whole semester and therefore were able to make their first friendships and were able to get used to everyday life at the university.

8 Conclusions

This study investigated the long term impact of Covid-19 on the life satisfaction of university students in Germany one year after the outbreak of Covid-19. The majority of existing studies have mostly focussed on the effect of Covid-19 on life satisfaction in the first weeks or months after the outbreak. However, four years after the initial outbreak, it is crucial to gain a more comprehensive understanding of the long-term effects of the pandemic on life satisfaction. My thesis offers a start of this analysis with a focus on university students.

In order to investigate the effect of Covid-19 on the life satisfaction of first-year students, this study used a DiD analysis with a control group that had started their studies without Covid-19. This method offers the possibility to exclude the ageing effect on life satisfaction. At the same time, this thesis looked at a period of time that, to my knowledge, has not yet been investigated in length for university students. The results show that life satisfaction of students was statistically significantly negative influenced by the Covid-19 one year after the outbreak of Covid-19.

The design allows for a more confident assertion that the Covid-19 pandemic had a negative impact on students' life satisfaction. Concurrently, the findings indicate that the impact persists over an extended period. This approach can facilitate a more profound comprehension of the manner in which individuals respond to crises.

It remains unclear how long it will take for life satisfaction for students to return to pre-Covid-19 levels and whether it will return to those levels at all. Therefore, it is important to continue monitoring the changes in life satisfaction. With further studies that take into account the limitations of these studies and ideas for future studies, the understanding of the impact of Covid-19 on young adults could be further improved and potential measures needed to mitigate negative effects could be put in place.

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Appendix

Table 12: Variable with explanation

Variable	*Explanation*
ID	Identification for the different individuals
Wave	Time period of survey
Life satisfaction	Scale from 0 to 10 self-reported by individuals
Gender	1 = male, 0 = female
Migration background	1, if individual or one of the parents wasn't born in Germany, 0 otherwise
Parental education	1, if at least one parent has a university degree, 0 otherwise
Satisfaction with the Studies	Scale from 0 to 10 self-reported by individuals
Direct consequence of covid-19 pandemic: Feeling of loneliness	Scale from 1 to 5 self-reported by individuals
Direct consequence of covid pandemic: Constraint in living standard	Scale from 1 to 5 self-reported by individuals
Direct consequence of high. Edu. Inst. Closure: Extension of studies	Scale from 1 to 5 self-reported by individuals
Direct consequence of covid pandemic: Money Problems	Scale from 1 to 5 self-reported by individuals
Does the individual have a job?	yes, no
Affectedness short-time work / unpaid leave	Short-time, leave without pay, none

Table 13: Mean life satisfaction of the subgroups

Cohort		*Wave*	*Mean life satisfaction*
Treatment group		Wave 1	7.987
		Wave 2	8.019
		Wave 3	7.632
Control group		Wave 1	8.001
		Wave 2	8.025
		Wave 3	8.032
Treatment group	female	Wave 1	8.010
		Wave 2	7.951
		Wave 3	7.663
Treatment group	male	Wave 1	7.987
		Wave 2	8.103
		Wave 3	7.594
Control group	female	Wave 1	7.971
		Wave 2	7.987
		Wave 3	8.055
Control group	male	Wave 1	8.059
		Wave 2	8.032
		Wave 3	7.986
Treatment group	migration background	Wave 1	7.907
		Wave 2	7.959
		Wave 3	7.670
Treatment group	no migration background	Wave 1	7.995
		Wave 2	8.029
		Wave 3	7.616
Control group	migration background	Wave 1	8.000
		Wave 2	8.038
		Wave 3	8.024
Control group	no migration background	Wave 1	8.013
		Wave 2	8.000
		Wave 3	8.019
Treatment group	at least one parent with university degree	Wave 1	8.051
		Wave 2	7.986
		Wave 3	7.623
Treatment group	no parent with university degree	Wave 1	7.904
		Wave 2	8.061
		Wave 3	7.643
Control group	at least one parent with university degree	Wave 1	8.007
		Wave 2	7.962
		Wave 3	7.983
Control group	no parent with university degree	Wave 1	8.026
		Wave 2	8.073
		Wave 3	8.082