

Does the Covid-19 pandemic change the way women and men experience flourishing?

A LIWC analysis

Sina Maggiore Welzel (s2880768)

Faculty of Behavioural, Management and Social Science, University of Twente

Master's Thesis

First supervisor: Marijke Schotanus-Dijkstra

Second supervisor: Dr. Saskia M. Kelders

March 13, 2022

Abstract

The Covid-19 pandemic has had a major impact on various aspects of our lives in recent years. However, it is still unknown whether the pandemic had an impact on our flourishing experience. To answer this, this study examined how individuals experienced flourishing before (2019), during (2020), and after (2021) the Covid-19 pandemic. A qualitative between-subject study design was used to collect data from 230 participants in three surveys. To analyse the qualitative data of the three separate cohorts, the software Linguistic Inquiry and Word Count (LIWC) and the statistical analysis software SPSS were used. The results showed that the Covid-19 pandemic had a minor impact on how individuals describe flourishing. Significant differences were found only in the LIWC categories Present and Occupation, with more present tense verbs used in 2020 and the frequency of occupation-related words decreasing from 2019 to 2021. Also, gender differences were examined, a two-factor ANOVA showed no significant interaction between the factor's year and gender. Significant differences between female and male participants were only found when all three samples were considered together. To describe flourishing, men used more words in the category's Money and Motion, and women more often used social terms and terms related to physical states and functions. However, the findings suggest that the Covid-19 pandemic did not affect men and women differently in terms of their perceptions of flourishing and the study rather indicates general language use differences than differences in flourishing. Moreover, the results showed that individuals focused on the here and now rather than referring to the future or the past when describing Flourishing experiences during the Covid pandemic.

Keywords: flourishing, Covid-19, LIWC, linguistic analysis, gender, qualitative research

Does the Covid-19 pandemic change the way women and men experience flourishing?

A LIWC analysis

The Covid-19 pandemic has preoccupied the entire world in recent years. Over six million people have died from the virus (WHO, as of Sept 22). Covid-19 refers to an infectious disease that first appeared in Wuhan, China, in December 2019. The viral disease spread so rapidly in China that the World Health Organization (WHO) declared it an epidemic in January 2020. After spreading to other parts of the world, the virus was declared a global pandemic on March 11, 2020 (WHO). The symptoms of the disease vary greatly in their form and severity. Affected individuals may suffer from fever, cough, rhinitis, and loss of taste and smell, or they may remain symptom-free. Particularly severe courses of disease can lead to pneumonia with pulmonary failure or even death. Insidious about the virus is that infected persons can infect others already 1-2 days before the onset of symptoms (RKI). Because of this, the virus could spread very quickly within a very short amount of time.

In order to counteract the rapid increase in the number of infections, a number of countermeasures were taken by the government, such as total or night-time curfews, home-schooling and home office mandatory, or restaurant and retail closures. These were intended to encourage the population to isolate themselves from other people and thus stop or slow down the spread of infection (Bundesregierung, 2020). The fact that people were suddenly unable to live their normal lives, had an impact on people's mental health during the Covid 19 pandemic. For instance, students reported a drop in their mental health, which was associated with a decreased ability to contribute to society, a decline in the quality of their social interactions, and because they felt like they were less engaged and involved in their everyday activities (Graham & Eloff, 2022). Another factor influencing mental health was the fear of possible infection. For example, a meta-analysis showed associations between fear of

COVID-19 and several types of mental health problems, such as anxiety, depression, sleeping issues, stress, factors of mental health, and lower mental well-being (Alimoradi et al., 2022). In addition to the primary focus of current research on mental illnesses, it is also important to explore the maintenance of high mental well-being in the context of the pandemic to gain a more holistic picture of the impact of the pandemic on human well-being. The highest level of well-being can be described by the term *flourishing* (Keyes, 2002).

Flourishing can be defined as a state in which people find happiness in daily life, being able to grow personally through worthwhile endeavours and connections and feeling a part of and connected to a larger whole (Bohlmeijer & Hulsbergen, 2018). According to Keyes (2002), mental well-being can be categorized into a continuum ranging from languishing to flourishing. Flourishers score high on the three components of mental wellbeing, namely emotional, social, and psychological well-being (Keyes, 2002). Emotional well-being means being satisfied and happy and interested in life (Diener, 1984). Psychological well-being refers to personal development and optimal functioning up to the fulfillment of one's goals in life. To achieve this, six components are essential: self-acceptance, purpose in life, autonomy, positive relations with others, environmental mastery, and personal growth (Ryff, 1989). Social well-being means being embedded and functioning optimally in society. This includes five components: social coherence, social acceptance, social actualisation, social contribution, and social integration (Keyes, 2002).

Even though much is known about flourishing through research yet, there is still much that is not known. For example, more research is needed to understand the long-term effects of flourishing. While many studies indicate that flourishing is related to a variety of positive outcomes, for instance, better physical health, higher resilience, and increased life satisfaction, more longitudinal studies are needed to better understand the long-term effects

of flourishing over time (Keyes, 2007). Additionally, understanding the factors that contribute to flourishing is an area where more research is needed. Although studies have shown that factors such as social support, positive emotions, and involvement in activities are related to flourishing, an understanding of how these factors contribute to and interact with overall well-being is not clear yet (Huppert, 2014). Moreover, more research is needed on the contextual and cultural factors that affect flourishing, including how to support well-being in diverse population groups (Diener & Tay, 2015). Accordingly, the science regarding flourishing remains still in its early stages (Schotanus-Dijkstra et al., 2015) and the majority of studies about flourishing are quantitative studies (Hefferon et al., 2017). However, qualitative research would be beneficial to capture laypersons' experiences to gain further insights and a more profound understanding of flourishing. In addition, linguistic analysis could be a powerful tool for investigating flourishing by examining language use patterns, identifying positive emotions, measuring subjective well-being, and identifying factors that promote flourishing, thus addressing the research gaps mentioned above. Furthermore, it is not yet known whether people change their definition of flourishing during difficult times such as the Covid-19 pandemic, and also if there are differences between genders in this regard.

Indeed, the current state of research on gender differences in flourishing is contradictory. Some studies found that women have lower levels of flourishing than men (Keyes, 2007; Keyes, Shmotkin & Ryff, 2002). In contrast, other studies showed that women have higher levels of flourishing than men (De la Fuente et al., 2019; Schotanus-Dijkstra et al., 2015). And in another study, no gender differences related to flourishing could be found (Shariff et al., 2022).

Regarding the Covid 19 pandemic, several studies showed a gender gap. It was found that the pandemic affected women more negatively in terms of social factors. The subjectively perceived loneliness increased for both genders but was more pronounced for women (Entringer et al., 2020). Women felt lonely more often after the outbreak of the pandemic and reported having more close friends before the pandemic (Etheridge, Ben & Spantig, Lisa, 2020). Moreover, while women report slightly lower well-being on average, men's well-being has increased a bit (Entringer et al., 2020).

Furthermore, it was determined through a comprehensive survey in the USA that the fear of Covid-19 had a negative impact on human flourishing in women, whereas, in men, no correlation was found between Covid-19 fear and human flourishing. This is the first study in the field that focuses on gender differences (Sürücü et al., 2021) and literature research revealed, that there is little research that addresses gender roles in relation to Covid-19 and flourishing. No other studies were found besides the one mentioned above. However, the results indicate that it would be interesting to further explore the role of gender.

Nonetheless, the study has some limitations. It is a quantitative measure that was conducted once in July 2020. Thus, it cannot provide insights regarding longer-term effects. In addition, the data comes from a specific group of people in the U.S. and may not be generalizable. The authors, therefore, recommend that qualitative research should be conducted in other countries with a more heterogeneous sample. For this reason, the present study attempts to address this.

Current study

The current study's aim is to investigate laypersons' language use by defining flourishing before, during, and after the Covid-19 pandemic. First, it is expected that there are differences in word use when individuals describe flourishing at the different survey time

points due to the special circumstances brought on by the Covid 19 pandemic. More specifically, participants are expected to use more future tense and past tense verbs in 2020 compared to 2019 and 2021, and to use more words in the “Social” (Communication, Other references to people, Friends, Family, Humans) and “Occupation” (School, Job or work, Achievement) categories.

Second, it is expected that female and male participants show differences in their word use. Because the results of a previous study by Park et al. (2021) that examined language related to well-being during the pandemic, it appears that women tend to emphasize social bonding and emotional support, while men tend to emphasize achievement and physical activity when discussing their experiences of flourishing during this time. Moreover, yet, the pandemic seems to have had a greater negative impact on women, in terms of social factors and well-being. Therefore, it is assumed that females use more words in the Social category and are more likely to use past tense verbs at the 2020 measurement time point compared to men.

Methods

Design

One open-ended question was used in a qualitative between-subject study design to collect data about human flourishing. The data collection took place at three different time points with various participants. The first survey was carried out in April 2019, the second one in April 2020, and the third one in April 2021. In 2019, Covid-19 was not yet present, while the second study was conducted during the first Covid-19 wave in Germany (this wave lasted from March 2020 to June 2020 (Schilling et al., 2021)). The third study was carried out post Covid-19. This term describes the period after the end of the second wave (this wave

lasted from October 2020 to January 2021 (Schilling et al., 2021)). The University of Twente's Ethical Committee provided their approval (no.190320 and 210168).

Participants and Procedure

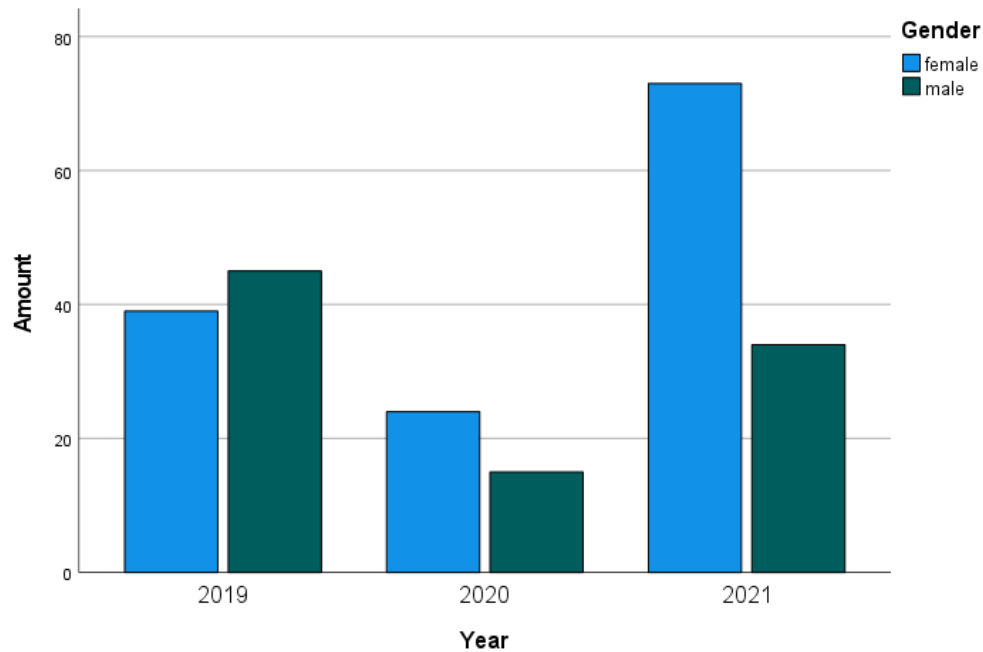
Students in their second and third years of psychology recruited participants from different genders and ages. This was done via convenience sampling, both using social media platforms and face-to-face contact. The inclusion criteria were that the participants were at least 18 years old and could speak German. They also had to have an email address and an internet connection, as the study took place online. Participants were sent information about the study and a link to participate via the email address they provided. After receiving the link, they had one week to complete the survey.

Demography

At all three test time points, participants had diverse academic backgrounds and differed in age. In April 2019 the participants ($N=84$) were between 18 and 67 years old and the mean age was 33.5 years ($SD=15.5$). In April 2020 the participants ($N=39$) ranged in age from 18 to 73, with a mean age of 30.3 ($SD=15.0$) years, and in April 2021 the mean age of the subjects ($N=107$) was 35.5 years ($SD=16.8$), ranging from 18 to 83. However, there were differences in the number of male and female participants across the three years (Figure 1).

Figure 1

Number of female and male participants in 2019, 2020 and 2021

**Table 1**

Overview of the Number of Participants and the Mental Health Continuum Short Form

(MHC-SF) Mean Score for all three samples (2019, 2020, 2021)

	2019			2020			2021		
	<i>N</i>	%	MHC-SF <i>M</i>	<i>N</i>	%	MHC-SF <i>M</i>	<i>N</i>	%	MHC-SF <i>M</i>
Female	39	46.4	3.97	24	61.5	4.17	73	68.2	4.14
Male	45	53.6	4.11	15	38.5	4.19	34	31.8	4.39
Total	84	100	4.04	39	100	4.18	107	100	4.22

Qualitative Measurement

One qualitative open-response question was used, which participants were asked to answer with 150-600 words. This question was asked in German, and it was formulated the same in 2019, 2020, and 2021. The question referred to flourishing within the participant and his or her associations with it. *“Flourishing means that you function optimally, as an individual and in relation to others and society. Please describe one or more situations in which you flourish. What do you do? What do you feel? What do you think?”*

Linguistic Inquiry and Word Count (LIWC)

Linguistic Inquiry and Word Count (LIWC) is a software system that was developed by Pennebaker et al. at the University of Texas in Austin. Its psychological foundation is the idea that underlying cognitive or emotional states have an impact on how language is used. In the end, this leads to alternative word choices (Pennebaker et al., 2001). The tool provides support to the theory that a person’s word choices will cause deeper meanings in their communications to emerge. The speaker or author may be conscious or unaware of this (Pennebaker et al., 2003). LIWC functions essentially as a data processing system. The system can be loaded with almost any type of text. Each word from the input file is compared to a dictionary of words or their stems that have been preloaded (McHaney et al., 2018). LIWC classifies more than 4000 words or associated word stems into categories by using more than 80 validated dimensions (Chung & Pennebaker, 2007). It is currently one of the most popular and well-validated methods for examining word use in personality and social psychology (Holtzman et al., 2019).

In the current study, the German_LIWC2001_Dictionary was used. In total, it includes dictionaries for 5 different head categories. These categories are *Standard Linguistic Dimensions, Psychological Processes, Relativity, Personal Concerns, and Experimental*

Dimensions. Under these head categories, there are 11 sub-categories, namely, *Affective or Emotional Processes, Cognitive Processes, Social Processes, Time, Space, Motion, Occupation, Leisure activity, Money and financial issues, Metaphysical issues, and Physical states and functions*, which have sub-dictionaries. For example, the category of *Affective or Emotional Processes* includes *Positive Emotions (Positive feelings, Optimism, and energy)* and *Negative Emotions (Anxiety or fear, Anger, Sadness or depression)*. A word is not exclusively assigned to one dictionary. The word 'cried', for example, would be assigned to the category *Affective or Emotional Processes* on the one hand and to the four subcategories *verbs, negative emotion, sadness, and past focus* on the other hand. So, if a word fits into several categories, the software will list it in each of them (Pennebaker, 2015). Example words for all LIWC categories are shown in Table 2.

Data Analysis

The qualitative data were inserted into LIWC as one Word document for each year. Before this, the data was cleaned, and a spell check was performed. In addition, two responses, from 2020 and 2021 were translated into German, as they were the only two responses given in English. After analysing the participants' answers, LIWC displayed the different word categories as percentages of the total word count. These were then processed by the statistical analysis software SPSS, version 28.0.1.0 (142). Normal distribution was tested using the Kolmogorov-Smirnov normality test. Some variables were shown not to be normally distributed. However, simulation studies showed that ANOVA is robust to violations of the normal distribution assumption when there are at least 15 participants per group in the case of 2-9 groups, which is the case in this study.

To answer the research questions about differences in defining flourishing before, during, and after the Covid-19 pandemic both in general and per gender, one- and two-way

ANOVA's were performed. The twelve categories Affect, Senses, Social, Motion, Past, Present, Future, Occupation, Leisure, Money, Metaphysical issues, and Physical states and functions were used as the dependent variables. When variance homogeneity was tested, it was found that the categories Senses, Future, Money, and Physical states and functions did not have equal variances. Thus, for these five categories, a one-factor ANOVA with gender as a factor and a Welch's t-test was performed to test possible effects of gender on the categories that do not have variance homogeneity.

Results

Table 2 provides a comprehensive overview of the mean percentages of word matches for each of the 12 investigated LIWC categories and the total number of words used by the participants. In 2019, subjects used on average 273 words for their definitions of flourishing, 246 words in the 2020 survey, and 279 words in 2021. In 2019, 38.78% of the total word count was allocated to a LIWC2015 category, in 2020 it was 39.36%, and 38.62% in 2021.

Differences between years

The results of the one-way ANOVA showed that there were only significant differences between the three groups (2019, 2020, 2021) in the categories Present and Occupation.

For the category Present, the highest mean 8.65 ($SD=2.35$) was found in the year 2020, followed by 2021 with a mean of 7.90 ($SD=1.99$) and a mean of 7.48 ($SD=1.87$) in 2019. Thus, more words were formulated in the present tense in 2020 than in 2021 and 2019. According to Cohen (1988), this was a small effect, $F(1,98,3) = 4.56$, $p = .023$, $\eta^2 = .039$. In contrast, the category Occupation was most common in 2019 ($M=7.31$, $SD=2.50$). In 2020 was the mean 6.45 ($SD=2.35$) and in 2021 this was 6.23 ($SD=2.07$). Again, the results represent a small effect, $F(1,100) = 5.45$, $p = .008$, $\eta^2 = .046$.

The Present category includes words that are written in the present tense, accordingly only verbs. The subjects used words such as have, is, get or give. For example, a sentence with several word matches in this category was: "When I **get** together with my friends and we **talk** for hours, **play** games, or **sit** outside in the summer, I usually **feel** very carefree and **have** no more worries."

The Occupation category refers to words related to job, work, school, or achievement. For example, participants used words such as society, responsibility, working, or competent, which were assigned to this category. A good example of a sentence in which many occupation-related words were used is the following: "I went to **work** with a good mood and **attitude** from the start and the nice reactions from my customers and **co-workers** have **improved** my mood and spread to my everyday life."

Table 2

LIWC category matches for all three samples: 2019 (N=84), 2020 (N=39), 2022 (N=107) as a percentage of the total word count

		2019 (%)	2020 (%)	2021 (%)	<i>p</i>
	Example words	Total of 22912 words	Total of 9596 words	Total of 29865 words	
Social	friends, family, discussing	9.57	9.88	9.99	.583
Present	walk, is, talk	7.48	8.65	7.90	.011
Affect	successful, honorary, humour	7.44	7.90	7.47	.507
Occupation	work life, financial, motivated	7.31	6.45	6.23	.005
Leisure	group, sport, play	1.93	1.85	2.05	.684
Past	given, performed, helped	1.47	1.65	1.67	.520
Motion	walking, reaching, jogging	1.11	1.36	1.11	.264
Physical	do, heart, passion	.89	.73	.90	.570
Money	cost, buy, appreciate	.52	.31	.35	.076
Future	tomorrow, will, soon	.40	.25	.39	.192
Metaphysical	meditation, mind, trust	.41	.20	.36	.066
Senses	listen, hug, eat	.25	.13	.20	.145

Gender differences

On average, female participants used 262 words to describe flourishing in 2019, whereas men used 277 words. In 2020, females utilized an average of 249 words and males 241 words in their definitions of flourishing, and in the following year, females averaged 294 words and males 248 words. Table 3 illustrates gender differences among the three samples (2019, 2020, 2021) on LIWC category matches. Significant main effects for gender were found for the categories Social, $F(1,186) = 4.41, p = .037, \eta^2 = .019$, Motion, $F(1,170) = 6.18, p = .060, \eta^2 = .027$, Money, $F(1,148) = 5.46, p = .021, \eta^2 = .027$, and Physical states and functions, $F(1,228) = 8.18, p = .005, \eta^2 = .031$. All of these categories showed small effect sizes (Cohen, 1988). More precisely, men used more words from the categories Money and Motion than women, while women used more words from the categories Social and Physical states and functions than men. However, no interaction effects were found between the two factors gender and year, ($ps > 0.74x$), although the category Presence was marginal significant ($p = .069$).

Money and Motion

Across all three surveys, the 94 male participants used more words of the category Money ($M=.51, SD=.61$) and Motion ($M=1.29, SD=.99$) compared to the 136 women ($M=.34, SD=.40; M=1.06, SD=.79$). The category Money includes terms that relate to money or financial matters. Words, of this category, which participants used were for example appreciation, purchases, money, financial, travel, own, and shopping.

Example words of the category Motion used by subjects were, for instance, walking, hiking, and driving.

Social and Physical States and Functions

In all three surveys, women used more words in the Social and Physical states and functions category than men. When all three years are considered together, women ($N=136$) used on average 10.14 words ($SD=2.62$) to indicate Social and a mean of 1.00 ($SD=.98$) for Physical states and functions compared to ($M=.935$, $SD=.276$; $M=.68$, $SD=.70$) for men ($N=94$). Example words of the Social category that were utilized by participants were e.g., friends, family, opinions, conversations, talking, listening, forgiving or expressive. From the Physical states and functions category participants used words like workout, passion, washing, hug, in love, or wonderful in this category.

Table 3

Gender differences in LIWC category matches for all three samples: 2019 (N=84), 2020 (N=39), and 2022 (N=107) as a percentage of the total word count, with an indication of p-values of the main effects and effect sizes shown by partial eta squared (ηp^2)

	2019 (%)		2020 (%)		2021 (%)		<i>p</i>	<i>ηp²</i>
	Female <i>N</i> =39 10231 words	Male <i>N</i> =45 12447 words	Female <i>N</i> =24 5981 words	Male <i>N</i> =15 3616 words	Female <i>N</i> =73 21434 words	Male <i>N</i> =34 8432 words		
Social	10.21	9.02	10.36	9.13	10.04	9.88	.037	.019
Present	7.95	7.06	8.44	8.98	8.29	7.07	.075	.014
Affect	7.48	7.40	7.94	7.84	7.41	7.60	.997	-
Occupation	7.40	7.23	6.80	5.90	6.01	6.70	.688	.001
Leisure	1.84	2.01	2.05	1.53	2.03	2.07	.599	.001
Past	1.49	1.46	1.62	1.69	1.67	1.68	.944	-
Physical	1.11	.69	.78	.66	1.01	.67	.005	.031
Motion	1.04	1.17	1.11	1.76	1.04	1.24	.014	.027
Money	.51	.52	.17	.63	.31	.44	.021	.027
Future	.34	.45	.33	.12	.36	.44	.499	-
Metaphysical	.32	.49	.22	.16	.39	.28	.989	-
Senses	.27	.23	.10	.18	.23	.13	.550	-

Discussion

The impact of the Covid-19 pandemic on laypersons' definitions of flourishing was tested through three qualitative surveys with 230 subjects. For this purpose, the LIWC software was used to investigate, on the one hand, whether there were differences in word use regarding the definition of flourishing before the outbreak of the Covid-19 pandemic (2019), during (2020), and after the first hot phase of the pandemic was over (2021), and, on the other hand, whether there were differences between men and women at the time points mentioned.

Impact of the pandemic on lay persons' definition of flourishing

The results show that the Covid-19 pandemic had very little impact on how individuals describe flourishing. Overall, the same number of words in the examined categories were used in all three years in which data were collected. Significant differences were found only regarding occupational concerns and the tense used. More specifically, it was found that in 2020, compared to 2021 and 2019, more verbs were written in the present tense. This result is not consistent with the expected assumption that more verbs would be used in the past tense and future tense in 2020. A possible explanation for the more frequent use of the present tense is provided by the research of Jingshi (2021). This research concludes that people can maintain their self-authenticity in the face of changing social roles due to the Covid-19 pandemic restrictions by focusing on the present or near future rather than the future (post Covid-19) or past (pre Covid-19). As a possible reason, the authors suggest that by focusing on the here and now, role inconsistencies are less noticeable.

Moreover, significant differences were found between years with regard to occupational concerns. The frequency of word use in this category was highest in 2019 and decreased with increasing years, which suggests that the particular circumstances of the Covid-19 pandemic had an impact. On one hand, the pandemic led to an increase in the

unemployment rate. While the unemployment rate was 5% in 2019, it rose to 5.9% in 2020 and 5.7% in 2021 (Bundesagentur für Arbeit, 2023). On the other hand, working conditions changed greatly because of the pandemic. Many people had to work from home and take care and home-school their children on the side due to the closed schools. In addition, many people were afraid of possible job loss and earnings decreased for many individuals, e.g., due to a reduction in working hours (Bünning, 2020). The loss of positive aspects of work or school, such as autonomy and socialization, due to the aforementioned factors could be a possible explanation for why fewer individuals included occupational-related terms in their definition of flourishing.

Another finding that could be seen in the current study is that for the definition of flourishing, words from the Social category were used most frequently, regardless of the year (Table 2) and gender (Table 3). These findings suggest that social well-being may play a greater role than emotional and psychological well-being (Keyes, 2002) when it comes to flourishing.

Gender gaps in defining flourishing under the influence of the Covid-19 Pandemic

The two-factor ANOVA showed no significant interactions between the factor's year and gender. This means that at the three individual time points, before, during, and after Covid 19, no significant differences in the definition of flourishing were found between genders. These results contradict prior studies showing that the pandemic impacted the two genders differently (e.g. Etheridge, Ben & Spantig, Lisa, 2020; Entringer et al., 2020; Sürücü et al., 2021). Unlike these studies, which conducted their surveys using Likert scale questionnaires, the current study used linguistic analysis to examine qualitative data. Thus, one possible explanation for the differences could be the open-ended response format in the

present study, which allows subjects to provide more individualized and in-depth responses rather than predetermined responses.

Although no significant differences were found between the genders for the different years, a significant effect was found between the genders when all three samples were considered together. Overall, men used more words in the category's money and motion, and women more often used social terms and terms related to physical states and functions to describe flourishing. However, looking at the results of a study by Haas (1979), it seems that the gender differences in the current study can be explained by general differences between women and men in language use. The results of Haas's study showed, among other things, that women tend to speak in a friendly, supportive, and expressive manner, and that they use evaluative and interpretive words more often, as well as talk about their psychological states and feelings more often. They also talked more about their families and home in general. Men, on the other hand, talked more about money, sports, and business and referred more often to time, destructive actions, physical movements, perceptual features, quantity, space, and objects. Since the significant results of the present study overlap with the results of Haas's (1979) study, it can be assumed that there are differences in general language use between women and men, but not specifically with regard to defining flourishing.

Limitations

A limitation of the present study is the difference between the samples. Specifically, the number of participants varied greatly between years (107 in 2021, 84 in 2019, and 39 in 2020) and the gender distribution varied a lot within and between years. For example, there were more than twice as many female participants in 2020 than in the other two surveys, and also more than twice as many women compared to men in 2021. Hence, the differences between the samples were measured by comparing three distinct groups, rather than

surveying the same individuals over the course of three years. This could lead to the findings being affected by the individual characteristics of each sample, thus making it more difficult to compare the results from each year (Jansen et al., 2017).

Furthermore, the disparity between the samples could have an impact on the generalizability of the results, since the results might not represent the general population in terms of flourishing, but rather females.

Additionally, the reliability of the results could be lower, since the reliability in LIWC is better when the number of words to be analysed is higher (Pannebaker et al., 2015).

Future Research

Future research should use representative and more homogeneous samples regarding the distribution of male and female test subjects. Therefore, the group of individuals to be examined should first be clearly defined and selected on the basis of specific exclusion and inclusion criteria.

Furthermore, the current state of research lacks qualitative research on flourishing. In this study, the LIWC software has proven to be a sufficient tool for gaining further insights into flourishing. Accordingly, it is recommended that more studies using LIWC be conducted in this field to fill the research gap regarding qualitative studies on flourishing. Particularly beneficial would be long-term studies that use a within-subject design in order to examine changes in participants' flourishing over time, as well as factors that may contribute to these changes (e.g., life events, personal experiences, environmental factors).

Conclusion

In conclusion, the present study used LIWC to investigate how the Covid-19 pandemic affected lay persons' definitions of flourishing. The results of this study showed that the Covid-19 pandemic had a limited impact on how individuals describe flourishing. It

was only found that individuals were more likely to use present tense during the pandemic and that there was a decrease in the frequency of word use in the occupational category over the years, but overall, the usage of words in the examined categories remained consistent and did not vary across the three years.

In contrast to prior studies, no differences were found between men and women in terms of how they experienced flourishing over the three years (2019-2021). However, viewed together gender differences were seen in four of the LIWC categories examined. Men used more words related to money and motion, while women used more social and physical terms. In addition, it was also noticeable that words in the social category were used most frequently in all years and by both females and males.

Overall, this study was able to contribute to gaining new knowledge about flourishing through language analysis using LIWC. By examining the qualitative data, it was possible to observe more individual aspects between people concerning flourishing. Thus, this study provides a foundation for future research using LIWC to explore flourishing further.

References

- Bohlmeijer, E., & Hulsbergen, M. (2018). *Using Positive Psychology Every Day: Learning How to Flourish* (1st ed.). Routledge.
- Bundesagentur für Arbeit. (2023, Januar 31). Arbeitslosenquote in Deutschland im Jahresdurchschnitt von 2005 bis 2023 [Graph]. *Statista*.
<https://de.statista.com/statistik/daten/studie/1224/umfrage/arbeitslosenquote-in-deutschland-seit-1995/>
- Bundesregierung. (2020). Leitlinien gegen Ausbreitung des Coronavirus (16.03.2020).
<https://www.bundesregierung.de/breg-de/themen/coronavirus/leitlinien-bund-laender-1731000>
- Chung, C., Pennebaker, J. (2007). The psychological functions of function words, in: K. Fiedler (Ed.1), *Social Communication, Psychology Press*, New York, pp. 343–359,
<http://dx.doi.org/10.4324/9780203837702>.
- Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates, Publishers.
- De la Fuente, R., Parra, A., Sánchez-Queija, I., & Lizaso, I. (2019). Flourishing during emerging adulthood from a gender perspective. *Journal of Happiness Studies*, 21, 2889-2908.
- Diener, E., & Tay, L. (2015). *Handbook of Well-Being*. DEF Publishers.
- Entringer, Theresa Margareta et al. (2020). Psychische Krise durch Covid-19? Sorgen sinken, Einsamkeit steigt, Lebenszufriedenheit bleibt stabil, *SOEPpapers on Multidisciplinary Panel Data Research*, No. 1087, Deutsches Institut für Wirtschaftsforschung (DIW), Berlin.

- Etheridge, B., Spantig, L., (2020). The gender gap in mental well-being during the Covid-19 outbreak: Evidence from the UK, *ISER Working Paper Series*, No. 2020-08, University of Essex, Institute for Social and Economic Research (ISER), Colchester.
- Graham, M.A., Eloff, I. (2022). Comparing Mental Health, Wellbeing and Flourishing in Undergraduate Students Pre- and during the COVID-19 Pandemic. *Int. J. Environ. Res. Public Health*, 19, 7438, <https://doi.org/10.3390/ijerph19127438>
- Haas, A. (1979). Male and female spoken language differences: Stereotypes and evidence. *Psychological Bulletin*, 86(3), 616–626.
<https://doi.org/10.1037/0033-2909.86.3.616>
- Hefferon, K., Ashfield, A., Waters, L., & Synard, J. (2017). Understanding optimal human functioning—The ‘call for qual’ in exploring human flourishing and well-being [Editorial]. *The Journal of Positive Psychology*, 12(3), 211–219.
<https://doi.org/10.1080/17439760.2016.1225120>
- Holtzman, N. S., Tackman, A. M., Carey, A. L., Brucks, M. S., Kufner, A. C., Deters, F. G., ... & Mehl, M. R. (2019). Linguistic markers of grandiose narcissism: A LIWC analysis of 15 samples. *Journal of Language and Social Psychology*, 38(5-6), 773-786.
- Huppert, F. A. (2014). The state of well-being science: Concepts, measures, interventions, and policies. In *Global Handbook of Quality of Life* (pp. 1-12). Springer Netherlands.
- Liu J., Dalton A., Lee J. (2021). The “Self” under COVID-19: Social role disruptions, self-authenticity, and present-focused coping. *PLoS ONE* 16(9): e0256939.
<https://doi.org/10.1371/ journal.pone.0256939>

- Keyes CLM. (2007). Promoting and protecting mental health as flourishing: A complementary strategy for improving national mental health. *American Psychologist*, 62, 95–108, <https://doi.org/10.1037/0003-066X.62.2.95>
- Keyes CLM. (2002). The mental health continuum: From languishing to flourishing in life. *Journal of Health and Social Behavior*, 43, 207–222.
- Keyes, C. L. M., Shmotkin, D., & Ryff, C. D. (2002). Optimizing well-being: The empirical encounter of two traditions. *Journal of Personality and Social Psychology*, 82(6), 1007- 1022.
- Lütfi Sürücü, Şenay Sahil Ertan, Evren Bağlarbaşı, Ahmet Maslakçı. (2021). COVID-19 and human flourishing: The moderating role of gender, *Personality and Individual Differences*, Volume 183, ISSN 0191-8869, <https://doi.org/10.1016/j.paid.2021.111111>
- Pennebaker, J. W., Francis, M. E., & Booth, R. J. (2001). Linguistic inquiry and word count: LIWC 2001. *Mahway: Lawrence Erlbaum Associates*, 71.
- Pennebaker, James & Boyd, Ryan & Jordan, Kayla & Blackburn, Kate. (2015). The Development and Psychometric Properties of LIWC2015.
- Park, G., Schwartz, H. A., Eichstaedt, J. C., Kern, M. L., Kosinski, M., Stillwell, D. J., ... & Seligman, M. E. (2021). Gender differences in well-being language on Twitter during the COVID-19 pandemic. *Journal of Happiness Studies*, 22(5), 2225-2240.
- J.W.Pennebaker, M.R. Mehl, K.G. Niederhoffer (2003). Psychological aspects of natural language use: our words, our selves, *Annual Review of Psychology* 54, 547–577.
- Jansen, M. G., Schuitema, J. A., & Maassen, G. H. (2017). Comparability of test scores: A review of recent research. *Educational Research Review*, 22, 1-19.

Robert Koch Institut (n.d.). Coronavirus SARS-CoV-2 - Epidemiologischer Steckbrief zu SARS-CoV-2 und COVID-19.

https://www.rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus/Steckbrief.html;jsessionid=F38504101A3FD8D9DD0902DBFBA7AFB5.internet071?nn=13490888#doc13776792bodyText3

Roger McHaney, Antuela Tako, Stewart Robinson (2018). Using LIWC to choose simulation approaches: A feasibility study, *Decision Support Systems, Volume 111*, Pages 1-12, ISSN 0167-9236, <https://doi.org/10.1016/j.dss.2018.04.002>

Ryff CD. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology*. 57, 1069–1081, <https://doi.org/10.1037/0022-3514.57.6.1069>.

Schilling J, Buda S, Fischer M et al. (2021) Retrospektive Phaseneinteilung der COVID-19-Pandemie in Deutschland bis Februar 2021. *Epid Bull*, 15, 8–17

Schotanus-Dijkstra, M., Pieterse, M. E., Drossaert, C. H. C., Westerhof, G. J., de Graaf, R., ten Have, M., Walburg, J. A., & Bohlmeijer, E. T. (2016). What factors are associated with flourishing? Results from a large representative national sample. *Journal of Happiness Studies: An Interdisciplinary Forum on Subjective Well-Being*, 17(4), 1351–1370. <https://doi.org/10.1007/s10902-015-9647-3>

Shariff, I., Wan S., Wan S. & Khairudin, R. (2022). Exploring the Relationship between Grit and Flourishing: Are There Gender Differences?. *International Journal of Academic Research in Business and Social Sciences*. 12. 10.6007/IJARBSS/v12-i3/12193.

Westerhof GJ, Keyes CL. (2010). Mental Illness and Mental Health: The Two Continua Model Across the Lifespan. *J Adult Dev*. 17(2), 110-119. doi: 10.1007/s10804-009-9082-y.

World Health Organization, (n.d.). Coronavirus disease (COVID-19) pandemic.

<https://www.who.int/europe/emergencies/situations/covid-19>