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What happens “behind the scenes”. Taking a closer look at beginning teachers’
day-to-day fulfillment of psychological needs and well-being at work

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Master Thesis – Onderwijsinnovatie

[S4173376]

[2st June] [2022]

PAMAOW04

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Abstract

Beginning teachers are at a greater risk for leaving their jobs within the first 5 years, due to high job demands (Whitaker, 2003). Especially, beginning teachers in special education report higher levels of stress and burnouts. Prioritizing the well-being of beginning teachers and understanding which factors play a role in stimulating well-being is therefore an important task in educational research. To gain insight into which factors affect the well-being of beginning teachers, the theoretical framework of the self-determination theory (SDT) was used in this study. SDT states that the fulfilment of the need for autonomy, competence and relatedness can stimulate one's well-being. Furthermore, we wanted to explore whether the fulfilment of needs and well-being fluctuated over time, within teachers, due to the high variation in the educational context. To test this, we used a within subject design, namely a diary study of seven weeks, to explore the fulfilment of needs and well-being of 25 beginning teachers, on a day-to-day basis.

The results showed that for almost all the participating teachers the fulfilment of needs and their well-being fluctuated on a day-to-day basis. Besides, all the daily needs correlated with daily well-being at the group level. Moreover, all the daily needs were significant predictors of daily well-being at the group level. When looking at the individual differences we saw that the way the needs related to the well-being differed between the teachers. For some teachers, autonomy and relatedness were significant predictors of daily well-being, while for others, competence was the only significant predictor.

Lastly, we found that daily experienced well-being differed between the teachers from special education, secondary education and primary education. However, the mean difference in fluctuation of well-being was nonsignificant between the different school types.

These findings show that a more tailored support for beginning teachers is needed, to support their different needs and to ultimately contribute to the well-being of beginning teachers in the future.

Introduction

Research shows that teachers are more vulnerable for work-related stress, psychological distress and burn-outs than employees in other occupational settings (Helms-Lorenz et al., 2015). Especially beginning teachers often report feeling overwhelmed by learning how they have to teach, and by fulfilling the complex roles and responsibilities they have within a school (Bettini et al., 2017). They gained professional knowledge during their studies but are now for the first time confronted with the complexity and demands of an actual classroom (Dollansky, 2014). During the first years of their career, they need to develop skills that enable them to combine all kinds of demanding tasks simultaneously (Dicke et al., 2015). This is in particular true for beginning teachers in special education. These teachers have to adapt their teaching to the diversity of special needs of their students, which is accompanied by rising stress levels and other negative emotions (Xu et al. 2021; Wu et al. 2020).

Due to these high demands, beginning teachers, and especially teachers in special education are at a greater risk for leaving their profession within 5 years (Fore et al., 2002; Whitaker, 2003). This contributes to the already societal issue of teacher shortage in the Netherlands. Therefore, it is important to prioritize the well-being of beginning teachers in research.

Previous research consistently showed that there is a link between how teachers cope with stressors and their well-being (De Clercq et al., 2021). According to Karanfil et al. (2020) it is important that teachers themselves, their school leaders and schoolboards pay attention to their occupational well-being. Occupational well-being can be described as the optimal functioning teachers experience during their work (Aldrup et al., 2017). When teachers have an optimal occupational well-being, they are engaged and passionate about teaching. They experience joy, excitement and pleasure while teaching their students. These positive emotions may lead to better instructions and higher student motivation and achievement (Aldrup et al.,

2017). In addition, research suggests that well-being of teachers is an important factor for the well-being of their students (Hobson et al., 2017). Thus, understanding which factors play a role in maintaining or stimulating the well-being of beginning teachers is an important task in educational research. The growing body of studies on well-being of teachers proposes that well-being emerges as a result of multifaceted interactions between contextual and environmental factors on the one hand and individual characteristics on the other (Hobson et al., 2017).

To gain insight into which factors affect the well-being of beginning teachers, the theoretical framework of the self-determination theory (SDT) is used. SDT is a motivational theory that offers a framework to specify social and environmental factors that are either supporting or unsupportive of intrinsic motivation and well-being through the fulfilment of one's basic psychological needs (Ryan et al., 2000). When one is intrinsically motivated, one seeks out opportunities and challenges to develop and explore new capabilities and learn. However, one will only feel intrinsically motivated when the behaviour is experienced as self-determined. Thus, accompanied by a sense of autonomy and with an internal locus of causality instead of external to the self (Ryan et al., 2000).

From previous research, guided by SDT, three innate psychological needs can be distinguished that are related to intrinsic motivation and therefore to one's well-being. These are the needs for competence, autonomy and relatedness (Ryan et al., 2000). Competence refers to how capable one feels when confronted with certain tasks (Manganelli et al., 2018). When this need is satisfied one feels effective and able to achieve preferred outcomes, and when unsatisfied one feels failure and doubts about one's capability (Chen et al., 2014). The need for autonomy refers to the self determination of one's actions and experiencing a sense of willingness and volition while doing this (Aldrup et al., 2017; Chen et al., 2014). When the need for autonomy is satisfied one experiences psychological freedom, when dissatisfied this

may lead to feelings of being controlled by external pressure (Chen et al., 2014). The need for relatedness can be defined as one's need to feel connected to others and to be loved and cared for by others. This need is satisfied when one develops close and meaningful relationships with others and experiences a sense of unity (Broeck et al., 2010). When this need is unsatisfied this can leave people feeling excluded or lonely (Chen et al., 2014).

SDT in education

SDT offers a general framework and is highly applicable in an educational setting because it can further our understanding in how teachers experience their work (Collie et al., 2016). According to Dollansky (2014), well-being of beginning teachers can be enhanced when their personal needs, including relationships with colleagues, feelings of belonging, independence and developing self-efficacy are addressed in their work. Likewise, Hobson et al. (2017) found that the fulfilment of relatedness and competence affected the well-being of beginning teachers. The beginning teachers noted that they felt related to their colleagues when being supported and cared for by their school networks (Hobson et al., 2017; Dollansky., 2014). These teachers felt competent when they felt capable of teaching in general or specifically in classroom management or pedagogical skills (Hobson et al., 2017). Additionally, the study of Collie et al. (2016) showed that perceived autonomy support by teachers affected the satisfaction of the basic psychological needs at work positively. Furthermore, Ebersold et al. (2019) found that autonomy support from a school principal had a positive effect on the well-being of teachers. Besides, Kutsyuruba et al. (2019) stated that in order to stimulate the well-being of beginning teachers, they should be part of a learning community within their schools and that this community should be characterized by connectedness, meaning, relatedness and collaboration between colleagues.

The stimulation of well-being is in particular important for young teachers in special education. They report higher levels of stress and have higher burn out rates than teachers in

regular education. This makes this group more at risk for leaving their job (Xu et al., 2021). Reasons for leaving are, amongst others, a lack of support from administrative personnel, colleagues from regular education and parents (Miller et al., 1999). Furthermore, previous research showed that there is a positive relationship between the amount of success, relationships, autonomy and dominance and the professional life quality that special education teachers experience in their work (Bozgeyikli, 2018). Additionally, in the study of Whitaker (2001) beginning teachers in special education reported a great need of emotional support from a mentor within the first year of their teaching career. Herein, we recognize the importance of the need for relatedness. Moreover, these teachers should be made aware of the challenges that come with teaching special needs students and learn new techniques to teach these children via specialized programs within their school. This may lead to a greater sense of self-efficacy among these beginning teachers and this may in turn contribute to the fulfilment of competence and autonomy (Stempien et al., 2002).

Thus, by looking through the lens of SDT we can examine whether the educational settings of beginning teachers in regular or special education contributes to the satisfaction of their psychological needs and whether this relates to their well-being.

Daily fluctuations

Previous research on job-related factors associated with employees' well-being mainly focused on the differences between employees, which attributed the different levels in employee's well-being to different work conditions or different relatively stable traits (Xanthopoulou et al., 2012). However there are some critical points to make in regard to this approach. One being the violation of the ergodicity assumption in this kind of research design. Ergodicity means that the relationship between variables measured on a group level are assumed to be the same as the relationships between the variables within people (De Ruiter et al., 2019). However, often this is not the case, and inferences made on aggregated group data

cannot plainly be generalized to the intra-individual level. This phenomenon is called: non-ergodicity (Molenaar et al., 2009). An intuitive example of non-ergodicity is the correlation between typing speed and number of typos (Fischer et al., 2018). At the level of the group the number of typos decreases when the speed increases, as more skilful typing makes for less mistakes. However, within individuals, the correlation is positive. As the faster someone types, the more mistakes are made, relative to someone's own slower speed. Many psychological processes, like the one we are studying, are non-ergodic. These processes occur in real time and are person-specific (Molenaar et al., 2009). Ignoring the problem of non-ergodicity may lead to incorrect conclusions and practical recommendations derived from between subject design (De Ruiter et al., 2019). The generalizability to individual levels can be stimulated by including a within subject design, such as a diary study. This is a research method that enables researchers to analyse intra-individual variation in diverse variables, like well-being, over a certain amount of time (Van der Krieke et al., 2017).

It can be insightful to apply this approach when investigating the well-being and psychological needs of beginning teachers, due to the daily variation that occurs in the educational context (Simbula, 2010). For instance, when beginning teachers are confronted with a lot of student misconduct and conflicts it might be labelled as an unpleasant and stressful day which can impact their feeling of well-being. On the contrary, a workday can also be experienced as joyful when a beginning teacher has access to more job resources, like social support from colleagues. This in turn can lead to a higher well-being (Simbula, 2010).

One of the earliest studies which investigated between and within differences in well-being of employees found that on days that the needs for autonomy and competence were fulfilled they experienced a higher daily well-being (Xanthopoulou et al., 2012). The study of Reis et al., (2000) confirmed these findings and added that when the need for relatedness increased on a daily basis, so did the daily well-being. Furthermore, the study Loopers et al.,

(submitted) used a within research design to explore the relationship between the fulfilment of needs and intrinsic motivation of students. This study showed that students differed in their relationship between the fulfilment of psychological needs and intrinsic motivation. For some students the need for competence was important for their intrinsic motivation. For others relatedness with the teacher was an important factor for determining intrinsic motivation (Loopers et al., submitted). Although this study did not focus on teachers, it might be possible that the individual differences that were found, may also apply to beginning teachers when investigating the relationship between the fulfilment of needs and their well-being.

Present study

The main focus of this study is to investigate which factors contribute to the well-being of beginning teachers. As a starting point for investigating these factors the framework of SDT was used. SDT states that when the need for autonomy, competence and relatedness are fulfilled in the workplace, it will ultimately lead to a higher occupational well-being of teachers (Ebersold et al., 2019). Additionally, SDT states that the factors in the work context can either hinder or promote the fulfilment of needs which in turn affects the well-being at work (Ryan et al., 2000). Despite the emerging knowledge base on what influences well-being of teachers in general, there is still limited literature specifying to what extent these influences apply to the well-being of beginning teachers in particular. To date, this area in educational research is still underdeveloped and undertheorized (Hobson et al., 2017).

Furthermore, the link between daily fluctuation in occupational well-being and daily experiences that occur at the workplace are recently more recognized by researchers. However, the amount of research is still limited (Simbula, 2010). Therefore, the first aim of this study is to investigate whether the fulfilment of need for competence, autonomy, relatedness and well-being by beginning teachers fluctuates over time, due to the high variation in educational contexts. Furthermore, the second aim of this study is to assess whether the daily fulfilment of

psychological needs and daily well-being are related. This is important because it offers us as a society insight into how different beginning teachers respond to the different work factors in an educational setting and how this affects their well-being. Additionally, given the finding that due to high job demands, the occupational well-being is lower for beginning special education teachers than for beginning teachers in regular education, it is important to take the differences in educational settings of beginning teachers into account when examining well-being at work. Hence, the final aim of this study is to investigate whether the daily fluctuation in well-being of beginning teachers in special education teachers and regular education differs.

By conducting this study, we gain valuable information about how we can offer tailored support that optimizes the development, performance and well-being of beginning teachers in the educational setting (Ryan et al., 2000; Ebersold et al., 2019).

In this study we will give answer to the following research questions:

1. How does the fulfilment of needs for autonomy, competence and relatedness of beginning teachers fluctuate within one semester?
2. How does well-being of beginning teachers fluctuate within one semester?
3. To what extent does the daily fulfilment of beginning teachers' autonomy, competence and relatedness in the work setting relate to their daily experienced level of well-being?
4. To what extent does the fluctuation in well-being of beginning teachers, who work in primary or secondary education, differ from that of beginning teachers in special education?

Methodology

Design

To measure the basic psychological needs and well-being of beginning teachers, the experience sampling method (ESM) was used. ESM is a research procedure that makes it possible to study what one feels, does and thinks during their daily lives (Larson et al., 2014).

Furthermore, the use of ESM allows the investigation of dynamic within-person processes including variability and growth over time (Fischer et al., 2012). Thus, by using the ESM method we gain insight in the daily fluctuation of the fulfilment of psychological needs and well-being of beginning teachers. To gather the data for this study, the participating beginning teachers received a diary questionnaire two times a week.

Validity

The focus on everyday life enhances the ecological validity of ESM (Hektner et al., 2011, p.3). This implies that findings that are derived from the analysis can be generalized to the daily situations of one's life (Van der Krieke et al., 2017). With ESM, respondents are asked to immediately report about their current behaviour, emotions, thoughts or situational context multiple times during the week (Fisher et al., 2012). The immediacy of the questions reduces the potential for recall-biases and social desirability in responses, which enhances the internal validity of ESM (Hektner et al., 2011, p.3).

Sample

The original sample of this study consisted of 31 beginning teachers, 24 (77.4%) female teachers and seven (22.6%) male teachers, in total. However, teachers were only included in the analysis if they completed at least five diary questionnaires during the semester. This cut-off point made it possible to include all the teachers from special education (minority group in this sample). Furthermore, this cut off point excluded the teachers that dropped out early or only started to participate around the end of the data collection. Based on this criteria, six teachers were excluded resulting in a final sample of 25 teachers in total (76% female). The mean age of the teachers was 27.67 (range = 20-54, sd = 7.63). The sample consisted of 11 teachers (44%) from primary education (PE), six teachers (24%) from secondary education (SE), four teachers (16%) from primary special education (PSE) and four teachers (16%) from secondary special education (SSE).

From previous research we learned that most of the beginning teachers leave education within their first five years of teaching (Den Brok et al., 2017; Lindqvist et al., 2014; Hammerness, 2008). Therefore, the criteria to be included in the sample was that the beginning teachers only worked in education for a maximum of five years (last phases of teacher training to +- 5 years after graduation). In this sample 11 teachers (44%) worked in education for one year, six teachers (24%) for two years, one teacher (4%) for three years, two teacher (8%) for four years and five teachers (20%) were doing a graduation internship. The mean years of teaching in education was 2.56 (sd = 1.96).

Procedure

For the recruitment of teachers, social media and the personal contacts of the researchers were used. The participants were asked through a recruitment message to email the researchers when they wanted to participate in the study. The procedure of data-collection was approved by the Ethical Committee of Pedagogy and Educational Sciences on the 14th of February 2022. Subsequently, the participants received an email with information about the study and the procedure. This email contained a hyperlink to the Qualtrics intake questionnaire. In this questionnaire they were asked for permission on the participation in the study and the collection of personal data (informed consent). Furthermore, in the email it was stressed that the answers of the teachers would be completely anonymous. This was assured by using personal codes to identify the teachers, which linked the answers of the questionnaires to anonymous teacher codes. With regard to data collection, the participating teachers were asked to fill out a brief online questionnaire on Qualtrics via their email or phone. This questionnaire included 19 closed questions and 1 open-ended questions. The participants were asked to fill out the questionnaire for two times (took approximately four minutes per occasion) a week for seven weeks, resulting in approximately 14 repeated measurements per participant. To prevent

missing data and teachers dropping out, the researchers sent reminders (every Sunday) to the teachers who forgot to fill in one or both questionnaires during the previous week.

Instruments and variables

The instrument that was used to measure the daily fluctuation of well-being and the fulfilment of psychological needs in the work setting of the beginning teachers was a diary questionnaire. The questionnaire entailed 19 items and one open ended question. The items were all statements about the experiences the teachers had at work the past two days. The responses were given on a slider, ranging from 0 (totally not true), 10, 20... to 100 (totally true).

The current study was part of a larger study on well-being and commitment of beginning teachers. The items of the diary questionnaire that were focused on during this study were those that were used to measure the variables: autonomy, competence, relatedness and well-being.

Well-being

The items for measuring well-being were based on the job-related affective well-being scale (JAWS) (Van Katwyk et al., 2000). JAWS consists of multiple statements regarding how a job makes one feel. Thus, the JAWS scale was used to measure the affective state of a respondent in regard to a job-specific context (Van Katwyk et al., 2000). In this case the items from JAWS that measure the well-being one experiences during their job were used. The two items were: *'During the past two days I felt satisfied at work'* and *'During the past two days I felt energized at work'*. The internal consistency (Cronbach's alpha) of this scale in the current study was 0.83.

Basic psychological need satisfaction

The items for measuring the fulfilment in autonomy, competence and relatedness were based on the Basic Psychological Needs Satisfaction and Frustration Scales (BPNSFS) (Chen et al., 2014). Originally each psychological need is measured by three items each, in the

BPNSFS. However, due to a limited amount of items in a diary questionnaire, to reduce the burden on the teachers, we used one item per psychological need. The item that was used to measure autonomy was *'During the past two days I felt free to make my own choices'*, for competence the following item was used: *'During the past two days I felt competent'*. The item: *'During the past two days I felt connected to colleagues and/or students'* was used to measure relatedness.

Data-analysis

Before performing any data analysis the scores of zero on either autonomy, competence relatedness or well-being were removed from the dataset. The used scales in the questionnaires had a score of zero by default which is why these scores were considered as missing values and were removed. In order to give an answer to the first and second research question, we depicted the individual teacher trajectories (intra-individual variation) of the variables autonomy, competence, relatedness and well-being, over time in line graphs. We depicted the trajectories of three types of education, namely PE-, SE and special education. The sample of PSE and SSE teachers were combined due to the small sample sizes of both types of education. In order to answer the third research question, we conducted a Spearman's rank correlation, due to the violation of the assumption for normality (see Table 4,5,6 and 7, appendix B) and homoscedasticity (see Figure 15,16 and 17, appendix B). This test was used to investigate the correlation between the daily fulfilment of needs and daily well-being in general. Additionally, a weighted linear regression was performed to examine whether the daily needs were significant predictors of daily well-being. The weighted regression was used because the residuals did not have a constant variance and this violated the requirement for a OLS regression (see Figure 18, appendix B). Moreover, we calculated Spearman's rank correlations between daily well-being and the daily fulfilment of needs per individual teacher. Lastly, in order to answer the fourth research question, we conducted the non-parametric Kruskal-Wallis Test, due to the violation

of the assumption for normality and homoscedasticity, needed for an independent sample t-test (see Table 7,9,10 and 11, appendix B). We first investigated the systematic difference in the overall experienced daily well-being between beginning teachers in primary-, secondary- and special education. Secondly, we examined the absolute mean difference in the fluctuation of well-being between primary-, secondary and special education. The absolute mean difference score in fluctuation consisted of an averaged score in differences in well-being between the 14 consecutive measurements ($\text{well-being}_{\text{day2}} - \text{well-being}_{\text{day1}} + \text{well-being}_{\text{day3}} - \text{well-being}_{\text{day2}}$ etc.) per individual teacher. To get a clear image of the distribution of the daily well-being and the fluctuation of daily well-being of primary-, secondary-, and special education teachers' boxplots were generated.

Results

Descriptive statistics

The 25 beginning teachers included in this sample completed a total of 284 diary questionnaires (response rate: 81.14%). This implies that each teacher completed an average of 11.36 questionnaires (min: 5, max: 14). The teachers from PE completed an average of 11.7 $N=129$ questionnaires (min: 7, max: 14). Teachers from SE completed an average of 12 $N=72$ questionnaires (min: 8, max: 14). Teachers from PSE completed an average of 12 $N=48$ questionnaires (min: 12, max: 14) and teachers from SSE completed an average of 8.7 $N=35$ questionnaires (min: 5, max: 13). The descriptives of the variables autonomy, competence, relatedness and well-being are shown in Table 1. The teachers scored highest on the fulfilment of relatedness, followed by autonomy and competence. The lowest score is that on daily well-being, yet this is still a relative high score in general ($M = 70.82$, $SD = 15.44$).

Fluctuation of the main variables

To depict the fluctuation of autonomy, competence, relatedness and well-being over time, line graphs were created for every teacher per type of education. This resulted in three

clustered line graphs representing the teacher’s fluctuation on the main variables from PE, SE and special education (PSE + SSE) separately.

Furthermore, every coloured line in the Figures 1 to 12 shows the fluctuation of the fulfilment of the main variables one individual teacher experienced over time.

Table 1
Descriptive Statistics of the Main Variables

		auto	com	rel	well-being
N	Valid	284	285	287	285
	Missing	66	65	63	65
Mean		78.73	75.89	84.15	70.82
Std. Deviation		17.39	14.78	15.79	15.44
Minimum		12	5	2	10
Maximum		100	100	100	98

Fluctuation of basic psychological needs

The scores on autonomy of the teachers from PE ranged between 50.00 and 100.00 ($N = 129$, $M = 81.58$, $SD = 12.66$) (see Figure 1, appendix A). The scores on autonomy of the teachers from SE ranged between 12.00 and 95.00 ($N = 72$, $M = 65.33$, $SD = 20.68$) (see Figure 2, appendix A). Lastly, the scores on autonomy of the special education teachers ranged between 34.00 and 100.00 ($N = 83$, $M = 85.90$, $SD = 14.17$) (see Figure 3, appendix A). Secondly, the scores on competence of the PE teachers ranged between 40.00 and 100.00 ($N = 129$, $M = 80.25$, $SD = 13.03$) (see Figure 4, appendix A). The scores on competence of SE teachers ranged between 5.00 and 90.00 ($N = 72$, $M = 67.51$, $SD = 16.35$) (see Figure 5, appendix A). The scores on competence of teachers from special education ranged between 36.00 and 100.00 ($N = 84$, $M = 76.39$, $SD = 12.91$) (see Figure 6 appendix A). Thirdly, the scores on relatedness for PE teachers ranged between 36.00 and 100.00 ($N = 129$, $M = 85.74$, $SD = 13.27$) (see figure 7, appendix A.). The scores on relatedness for SE teachers ranged

between 2.00 and 100.00 ($N = 72$, $M = 79.07$, $SD = 19.52$) (see Figure 8, appendix A). The scores on relatedness for special education teachers ranged between 11.00 and 100.00 ($N = 86$, $M = 86.00$, $SD = 15.03$) (see figure 9, appendix A).

When looking at the fluctuation of scores on the psychological needs across time, it can be noted that overall, PE teachers show relatively more stable trajectories than teachers from SE and special education. Furthermore, the scores on each of the psychological needs is in general higher for PE teachers than for SE and special education teachers. The trajectories of SE and special education teachers are overall more erratic than that of PE teachers, due to the sharp increases and declines in their trajectories. Moreover, the scores of SE and special education teachers are generally more distributed across the minimum and maximum range, than the scores of PE teachers. Thus, it seems that the trajectories of SE teachers differ substantially from each other. This phenomenon also seems to apply to special education teachers.

Fluctuation of well-being

The fluctuation of well-being of PE teachers ranged between 10.00 and 98.00 ($N = 129$, $M = 72.26$, $SD = 14.75$) (see Figure 10). The fluctuation of well-being for SE teachers ranged between 20.00 and 88.00 ($N = 72$, $M = 65.69$, $SD = 12.90$) (see Figure 11). The fluctuation of well-being for special education teachers ranged between 18.00 and 98.00 ($N = 84$, $M = 73.02$, $SD = 17.52$) (see figure 12). When looking at the trajectories of well-being among PE teachers, we observe that most of the teachers show trajectories that are relatively stable, with overall high scores on well-being across time. Yet, there are some teachers that show greater variation in their scores on well-being across time (ID 7, 4, 10). SE teachers show a relatively similar pattern to that of PE teachers with regard to the fluctuation of well-being. What stands out is that most peaks in these trajectories seem to run above the group average. However, their overall scores on well-being (across time), seem to be relatively lower than that of PE and special

education. Furthermore, the trajectories of SE are closer together than that of PE and special education teachers. When looking at the trajectories of special education teachers, we can distinguish a more erratic pattern than that of PE and SE teachers. This seems to be partly caused by a few teachers (ID: 24, 14) who's scores are mostly below the mean of the group.¹

¹ There are two horizontal lines depicted in every line graph. The blue interrupted line represents the mean fulfilment of the main variables for all the beginning teachers together. The mean of the fulfilment of autonomy, competence, relatedness and well-being of the teachers from a specific type of education, thus either primary education, secondary education or special education, is represented by the purple line.

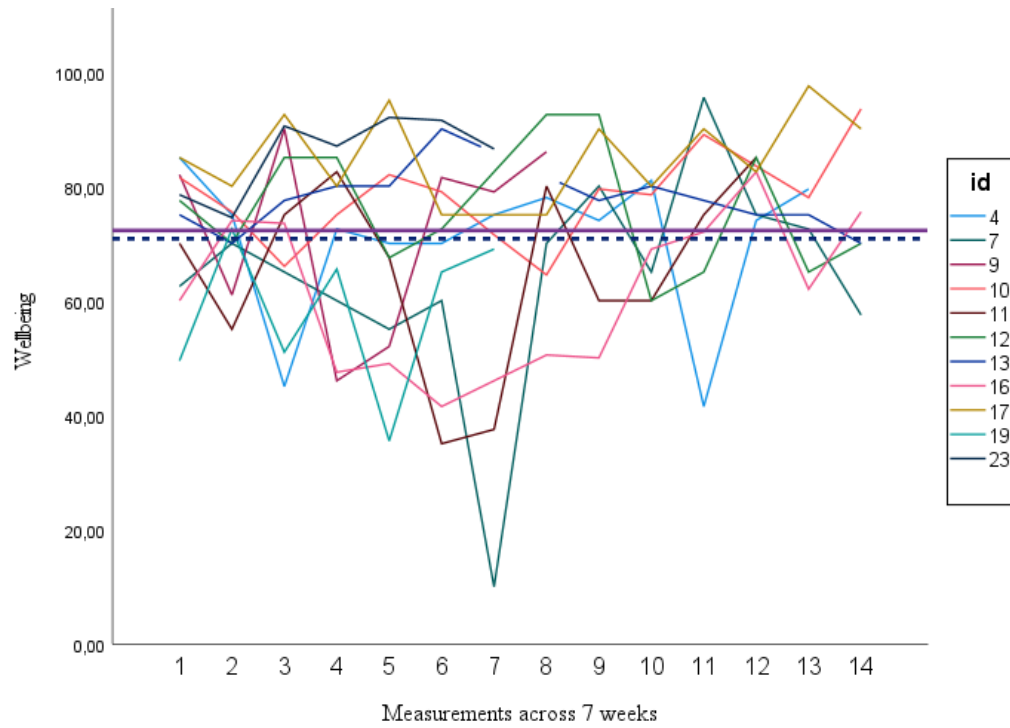


Figure 10. Well-being of individual teachers in primary education over time.
 Horizontal purple line = group mean, horizontal blue line = mean overall

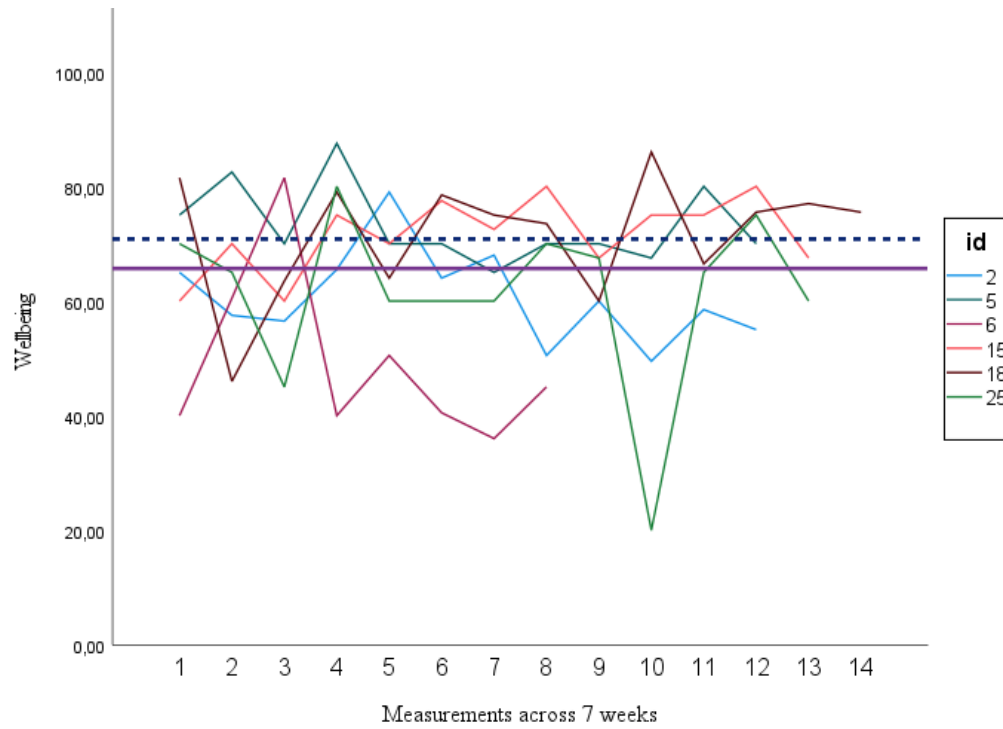


Figure 11. Well-being of individual teachers in secondary education over time. Horizontal purple line = group mean, horizontal blue line = mean overall

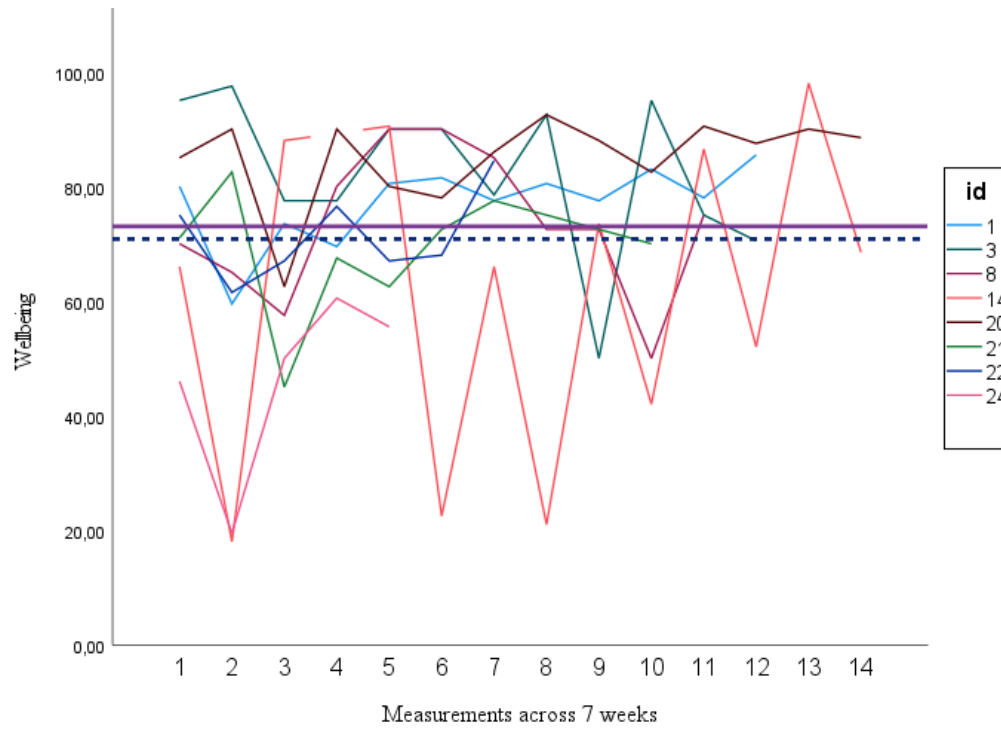


Figure 12. Well-being of individual teachers in special education over time.
 Horizontal purple line = group mean, horizontal blue line = mean overall

Relationship between daily basic psychological needs and daily well-being

Firstly, due to the violation of the assumption for normality (see appendix B) and sample size ($N < 30$ per teacher) a Spearman's rank correlation was performed. Results are shown in Table 2. All the daily basic psychological needs correlated positively with daily well-being (autonomy: $r^s(284) = .472, p < .01$) (competence: $r^s(285) = .593, p < .01$) (relatedness: $r^s(285) = .569, p < .01$). Furthermore, a weighted linear regression was performed, due to the violation of homoscedasticity (see appendix B). The daily fulfilment of autonomy, competence and relatedness explained a significant part of the variance in daily well-being ($R^2 = .682; F(3,280) = 81.13, p < .01$). Furthermore, all the psychological needs have a significant positive effect on well-being. Competence ($\beta = .398, p < .01$) and relatedness ($\beta = .371, p < .01$) have the highest coefficients, followed by autonomy ($\beta = .111, p = 0.04$).

Table 2
Correlation among Daily Basic Needs and Daily Well-being

Psychological Needs	1.	2.	3.
Autonomy			
Competence	.569**		
Relatedness	.434**	.422**	
Well-being	.473**	.593**	.569**

Note: N= 285 ** Correlation is significant $p < .01$ (2 tailed).

Individual differences

Secondly, we explored the relationship between psychological needs and well-being at the level of the individual teacher by executing multiple Spearman rank correlations. This analysis was executed on two PE teachers, two SE teachers, two PSE teachers and two SSE teachers, each with a minimum of 10 measurements. The results show that five out of eight teachers had at least one significant correlation between the fulfilment of a daily psychological

need and daily well-being versus three teachers who did not show any significant correlation. For these five teachers the following applies: The higher the score on the daily fulfilment on at least one of the psychological needs, the higher the score on well-being at that particular day. However, which particular daily need(s) correlated with daily well-being differed between the teachers. We observed that for the teachers from SE (ID: 3 and 4) and one teacher from PSE (ID: 5), on days where their need for autonomy and relatedness was fulfilled, this related to a higher experienced well-being for them. In contrast, we saw that the fulfilment of competence in a day significantly related to a higher experienced well-being that day, for one PE (ID: 2) and one SSE teacher (ID: 7). For an overview of the results from these analyses, we refer to Table 3.

Table 3*Correlation between Daily Needs and Daily Well-being among the Individual Teachers*

Type of Education	ID	Questionnaires (N)	Psychological Needs			
			1.	2.	3.	
PE	1	N = 13	1. Autonomy			
			2. Competence	.453		
			3. Relatedness	.818**	.296	
			4. Well-being	-0.128	.165	-.241
	2	N = 14	1. Autonomy			
			2. Competence	.635		
			3. Relatedness	.596	.323	
			4. Well-being	.120	.714**	.263
SE	3	N = 13	1. Autonomy			
			2. Competence	.679*		
			3. Relatedness	.614*	.420	
			4. Well-being	.599*	.113.	.760**
	4	N = 12	1. Autonomy			
			2. Competence	.343		
			3. Relatedness	.163	.194	

PSE	5	N = 12	4. Well-being	.656*	.328	.607*
			1. Autonomy			
			2. Competence	.779**		
			3. Relatedness	.751**	.794**	
SSE	6	N = 14	4. Well-being	.717**	.463	.583**
			1. Autonomy			
			2. Competence	.090		
			3. Relatedness	.536*	.249	
SSE	7	N = 14	4. Well-being	-.470	.303	-.005
			1. Autonomy			
			2. Competence	.365		
			3. Relatedness	.404	.731**	
SSE	8	N = 10	4. Well-being	.377	.725**	.635**
			1. Autonomy			
			2. Competence	.344		
			3. Relatedness	.628	-.028	
SSE	8	N = 10	4. Well-being	.179	.362	-.016
			1. Autonomy			
			2. Competence	.344		
			3. Relatedness	.628	-.028	

Note: N = 8 * Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2 tailed).

Differences in daily well-being

Figure 13 shows the distribution of the mean scores in daily well-being for primary-, secondary and special education. The boxplot shows that the distribution of scores of daily well-being are quite similar for PE and special education teachers. However, the distribution of daily well-being for SE teachers differs because it has a shorter range and the median is lower than that of PE and special education teachers. Furthermore, the boxplot tells us that roughly 50% of the scores on daily well-being for PE teachers fall between 65.00 and 81.75 (Mdn = 75.00, IQR = 16.75). For SE teachers the scores fall between 60.00 and 75.00 (Mdn = 67.50, IQR = 15.00). And for special education teachers the scores fall between 66.25 and 85.88 (Mdn = 77.0, IQR = 19.63). Moreover, the data is highly negatively skewed, for PE (skewness = -1.09), for SE (skewness = -1.02) and for special education teachers (skewness = -1.34). This may be caused by the outliers of 10.00 for PE, 20.00 for SE and 18.00 for special education teachers.

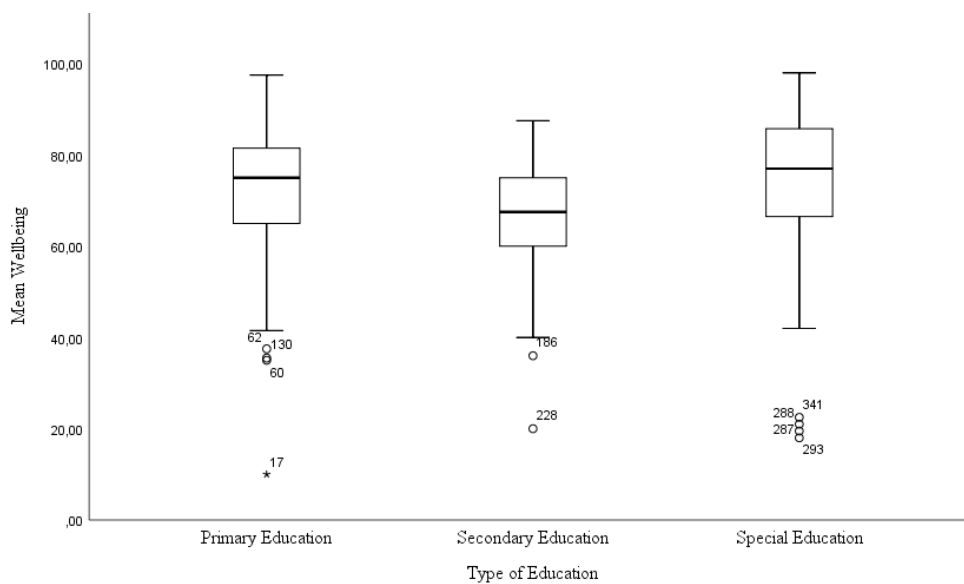


Figure 13. The distribution of the mean scores in daily well-being for teachers from PE, SE and special education.

To explore whether the mean in daily well-being differed between PE, SE and special education teachers, a Kruskal-Wallis test was executed. This test was executed due to the violation of normality (see appendix B). The test indicated that the difference between the mean

well-being of PE (Mdn = 75.00, $SD = 14.75$), SE (Mdn = 67.50, $SD = 12.90$) and special education (Mdn = 77.00, $SD = 17.52$) was statistically significant, $H(2)$ ($N_{primaryeducation} = 151.30$, $N_{secondaryeducation} = 107.51$, $N_{specialeducation} = 160.67$) = 18.55, $p < .01$, $\eta^2 = 0.038$.

Differences in the fluctuation of daily well-being

Figure 14 shows the distribution of the absolute mean difference scores in the fluctuation of daily well-being for PE, SE and special education teachers. The boxplot shows that the mean scores of fluctuation in daily well-being deviates between PE, SE and special education. For teachers from PE the following applies: 50% of the scores of fluctuation in daily well-being fall between 4.50 and 17.13 (Mdn = 7.05, IQR = 12.63). Furthermore the data is highly positively skewed for PE (skewness = 2.55), probably due to the extreme outliers, indicated by a star shape (3 x IQR). For SE teachers 50% of the scores of fluctuation in daily well-being fall between 5.00 and 15.13 (Mdn = 10.00, IQR = 10.13) and this data is also positively skewed (skewness = 1.65). For special education teachers, roughly 50% of the scores of fluctuation in daily well-being fall between 4.50 and 27.50 (Mdn = 10.0, IQR = 23.00) and this data is also positively skewed (skewness = 1.69). Moreover, the boxplots show that the distribution of the lowest 25% of scores is roughly similar between the SE and special education teachers.

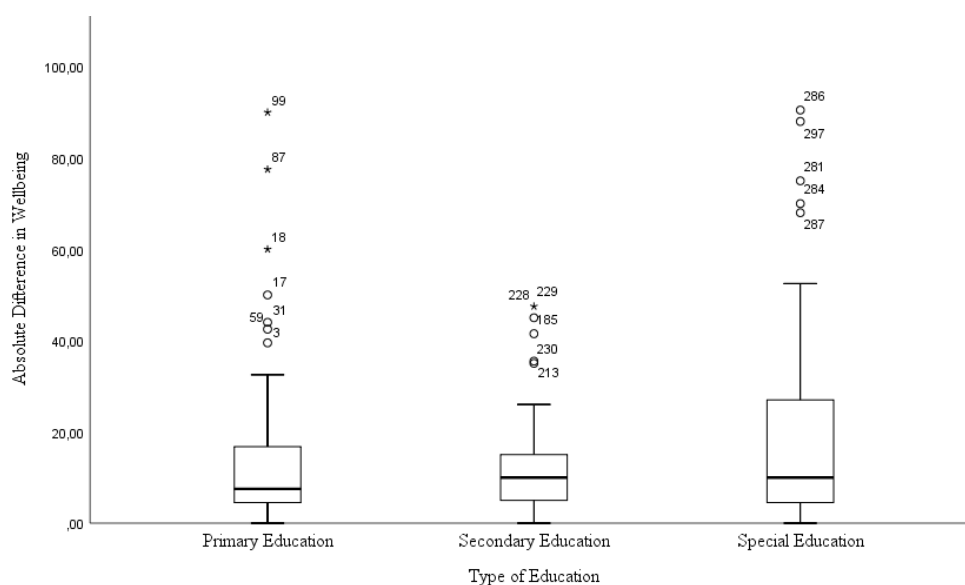


Figure 14. The distribution of the mean fluctuation scores in daily well-being for teachers from PE, SE and special education.

However, the distribution of the highest 25% of data is wider for special education teachers, compared to PE and SE teachers, with a maximum score of approximately 28.00 for special education teachers, 18.00 for PE teachers and 16.00 for SE teachers.

To test whether the mean fluctuation in daily well-being differed between PE, SE and special education teachers, a Kruskal-Wallis test was executed. This test was executed due to the violation of normality and homoscedasticity (see appendix B). The Kruskal-Wallis test showed that the difference in the mean fluctuation of well-being between PE (Mdn = 7.50, $SD = 14.68$), SE (Mdn = 10.00, $SD = 10.44$) and special education (Mdn = 10.00, $SD = 21.05$) was nonsignificant, $H(2) (N_{PrimaryEducation}= 128.54, N_{SecondaryEducation}= 131.00, N_{SpecialEducation} = 141.45) = 1.415, p = 0.49, \eta^2 = 0.02$.

Discussion

In this study the within fluctuation in autonomy, competence, relatedness and well-being of beginning teachers was examined. The first goal of the study was to examine whether the daily fulfilment of autonomy, competence and relatedness and well-being fluctuated per individual teacher. Furthermore, the second goal of this study was to investigate whether the daily fulfilment of needs related to the daily well-being experienced by beginning teachers. The final goal was to examine whether the fluctuation of well-being differed between teacher from regular (primary and secondary education) and special education.

To get a clear image of the fluctuation of the needs and well-being at the individual level a diary study was executed. Using experience method sampling made it possible to collect multiple data points of the experienced basic psychological needs and well-being by the beginning teachers in real time (Loopers et al., submitted). The data showed that indeed, for almost all the beginning teachers, the fulfilment of needs and well-being fluctuated on a day-to-day level. This resulted in very diverse trajectories for each individual teacher on each of the four variables. Additionally, the line graphs showed that the trajectories of SE and special

education teachers were more erratic, with more peaks and drops, than that of PE teachers. PE teachers showed relatively more stable patterns of fluctuation (closer together, less sharp declines and increases from day to day).

Our findings with regard to the fluctuation in well-being of PE, SE and special education teachers seems to confirm the claim of Xanthopoulou et al. (2012) stating that the general level of well-being is relatively stable but that there is substantial fluctuation from day to day around this general level. Moreover, the observed pattern of fluctuation is in line with what we would expect when using a *state approach* instead of a *trait approach*. The trait approach argues that the psychological needs and well-being are relatively stable features of someone, in this case teachers. In contrast, the state approach argues that the needs and well-being are *states*. These reflect how individuals feel about themselves and the environment at certain points in time and these states might change over time in response to the changing characteristics of the environment (Xanthopoulou et al. 2012; Cervone, 2005).

Besides, the influence of the contextual factors on the teachers fulfilment of psychological needs and well-being is in line with the assumption of SDT that there are certain factors in one's environment that can either support or thwart the fulfilment of one's needs (Evelein et al., 2008). More research is necessary, especially qualitative research, to shed a light on what kind of daily situations cause a beginning teacher to experience either more or less satisfaction of their needs. Furthermore, our research findings showed that the daily fulfilment of autonomy, competence and relatedness related to a higher experienced well-being for that day. This finding is in line with the SDT (Ryan et al., 2000), which states that the fulfilment of all the needs correlate positively with well-being.

Moreover, we found that competence and relatedness show the strongest relationship with well-being, followed by the need for autonomy. This result is consistent with the finding of Hobson et al. (2017) who found that competence and relatedness, and to a lesser extent

autonomy, had an impact on the well-being of beginning teachers. A possible explanation for this might be, that especially support from a mentor or colleagues (relatedness) and guidance in how to teach, (competence), is important for beginning teachers in their early years and for the decision to stay in education (Miller et al., 1999). And it might be thinkable that more experienced teachers, with established social networks and confidence in their own teaching, benefit more from a sense of autonomy, the need to act with a sense of choice and volition (Van den Broeck et al., 2016). This is consistent with the finding from the study of Collie et al. (2016) in which they show that for more experienced teachers (average age: 44, average years of teaching: 15 years) the fulfilment of autonomy was the most important predictor of teachers' well-being.

When looking at the within-person correlations we saw that the teachers differed in their relationship between their fulfilment of needs and well-being. For some teachers autonomy and relatedness related significantly to well-being, while for others competence was the only need that was significant. And for yet others, the relationship between the fulfilment of needs and well-being was nonsignificant or even negative. This contradicts the assumption of SDT stating that the satisfaction of all of the basic needs is universally beneficial for one's well-being (Chen et al., 2014). However, our findings are in line with that of Loopers et al.,(submitted). They showed that students differ in strength and direction of the relationship between the satisfaction of needs and intrinsic motivation. In addition, Reis et al., (2000) noted that it might be possible that some people are more responsive to daily variations of needs than others, which may result in individual differences in the fulfilment of psychological needs and well-being and the relationship between those.

Lastly, we examined the difference in fluctuation in daily well-being between beginning teachers from primary-, secondary and special education. Our findings showed a significant result for the difference in daily well-being between primary-, secondary-, and special

education, with the highest daily well-being for special education. This is contradictory to previous research that showed that well-being of teachers working in special education is lower than that of teachers working in regular education, due to high job demands (Fore et al., 2002; Whitaker, 2003). A possible factor might be that the teachers from special education, who experience high stress levels, are precisely those that dropped out, or did not participate at all. Thus, it might be possible that special education teachers that are less stressed or experience a higher well-being are overly represented in the sample, which makes this finding not representative for special education teachers in general (Rossi et al., 2019). Furthermore, we found that SE teachers scored lower on well-being than PE and special education teachers. This is in line with the study of Wang et al. (2015) stating that working in primary education seems to be more stimulating to well-being than working in secondary education, which might explain the relative low score on well-being for SE teachers.

When examining the fluctuation of well-being our results showed a nonsignificant difference between the averaged fluctuation of well-being between teachers from SE, PE and special education. Although, not significant now, the fluctuation might be significant when testing more than eight teachers in special education. Which would be in line with what we would expect based on the finding that special education teachers experience more negative emotions than teachers in regular education (Wu et al., 2020). These teachers have to deal with students with a diversity of physical and mental characteristics. This puts a large pressure on these teachers. This could perhaps be translated into a greater fluctuation of momentary well-being for special education teachers. This is also in line with the study of Simbula (2010) who stated that when teachers are confronted with a lot of demands on a stressful day, this might result in higher level of exhaustion and poorer mental health on that certain day.

Limitations and recommendations

This study has several limitations and some recommendations for future

research. Firstly, we dealt with a lot of postponed responses on the questionnaires. According to Simbula (2010) the fundamental advantage of within person design is the examination of reported events close to their actual occurrence. However, because some teacher filled the questionnaires in during the weekend, instead of directly after receiving the questionnaire, a part of the data might still have been sensitive to recall-biases. Furthermore, Bakker et al. (2007) argues that when respondents have to report in a retrospective manner instead of close to occurrence, they might be more likely to remember the negative experience over the momentary positive experience. This issue of recall-biases forms a threat for the internal validity. It can be dealt with when researchers use a program that prevents responses after a certain amount of time has passed (Hektner et al., p. 4).

A second limitation of this study was the amount of person and day level measurements. In order to generalize conclusions of experiences across days, a large sample and a large number of days per participant are necessary (Ohly et al., 2010). Moreover, when investigating the relationship between daily variables a large number of daily measurements is necessary. Additionally, with regard to power of the analyses, Olhy et al. (2010) argues that increasing the sample size at the person level has a greater impact on power than increasing the number of daily measurements. And that a sample size with less than 30 participants may lead to biased results (Olhy et al. 2010). Thus with a sample size of 25 and with a minimum of five data points and a maximum of 14 data points per teacher, it is important to interpret the results with extreme caution. In summary, increasing the day and person level measurements in future research, might make it possible to discover other within person correlations between the needs and well-being.

Thirdly, there was some dropout of teachers working in special education. According to Hektner et al. (2011, p. 5) attrition is a problem with regard to external validity because the remaining data are less presentative of the intended population. A few special education

teachers did drop out due to a lot of work pressure. The question remains whether our sample is overly represented by ‘healthy and happy’ teachers and that the overly stressed teachers did not participate due to the burden of participating in a diary study. Hektner et al. (2011, p. 5) underlines this point saying that in ESM studies psychologically healthy people are overly represented, resulting in less representative study samples.

Finally, we dealt with the phenomenon of nested data in this study. The repeated measurements in this study are nested because the observations are nested within the individual (Peugh, 2009). These nested data violates the assumption of independent observations that is required for multiple regression or Anova. These analyses can produce Type I errors and biased estimates of parameters, when using with nested data. For future research it is recommended to use multilevel modelling (MLM) because it makes it possible to directly model the inter- and intra-individual variation in the psychological needs and the well-being of beginning teachers and investigate how these relate to each other. Furthermore, MLM is an appropriate analysis to deal with incomplete datasets, which is often the case in diary studies (Osborne et al., 2000).

Implications for educational practice

The finding that almost every teacher experienced different trajectories on the fulfilment of each variable implies that a *one size fits all* support for beginning teachers won’t suffice because it seems that every teacher has a different need on a daily level. Moreover, the finding that the teachers differ in how their needs relate to their well-being stresses this point. Both of these findings highlight the fact that it is important to engage with teachers about what they personally need in their work environment. It seems that there are certain experiences that influence the teachers fulfilment of needs and this might influence their well-being. Schools should talk with their beginning teachers about what kind of experiences makes them act or feel a certain way, and with that information in mind, offer tailored support. In addition, insight on within fluctuations of positive well-being, thus looking at the days with peaks in well-being,

can be translated into better working conditions that help beginning teachers to feel happy, healthy and perform better on daily basis (Xanthopoulou et al. (2012).

In conclusion, a more tailored support for beginning teachers is needed, to accommodate their different needs and to ultimately contribute to the well-being of the future generation of teachers.

References

- Aldrup, K., Klusmann, U., & Lüdtke, O. (2017). Does basic need satisfaction mediate the link between stress exposure and well-being? A diary study among beginning teachers. *Learning and Instruction, 50*, 21–30. <https://doi.org/10.1016/j.learninstruc.2016.11.005>
- Bakker, A. B., Hakanen, J. J., Demerouti, E., & Xanthopoulou, D. (2007). Job resources boost work engagement, particularly when job demands are high. *Journal of Educational Psychology, 99*(2), 274–284. <https://doi.org/10.1037/0022-0663.99.2.274>
- Bettini, E., Jones, N., Brownell, M., Conroy, M., Park, Y., Leite, W., Crockett, J., & Benedict, A. (2017). Workload Manageability Among Novice Special and General Educators: Relationships With Emotional Exhaustion and Career Intentions. *Remedial and Special Education, 38*(4), 246–256. <https://doi.org/10.1177/0741932517708327>
- Bozgeyikli, H. (2018). Psychological Needs as the Working-Life Quality Predictor of Special Education Teachers. *Universal Journal of Educational Research, 6*(2), 289–295. <https://doi.org/10.13189/ujer.2018.060211>
- Broeck, A., Vansteenkiste, M., Witte, H., Soenens, B., & Lens, W. (2010). Capturing autonomy, competence, and relatedness at work: Construction and initial validation of the Work-related Basic Need Satisfaction scale. *Journal of Occupational and Organizational Psychology, 83*(4), 981–1002. <https://doi.org/10.1348/096317909x481382>
- Cervone, D. (2005). Personality Architecture: Within-Person Structures and Processes. *Annual Review of Psychology, 56*(1), 423–452. <https://doi.org/10.1146/annurev.psych.56.091103.070133>

- Chen, B., Vansteenkiste, M., Beyers, W., Boone, L., Deci, E. L., Van der Kaap-Deeder, J., & Verstuyf, J. (2014). Basic psychological need satisfaction, need frustration, and need strength across four cultures. *Motivation and emotion*, *39*(2), 216-236.
<https://doi.org/10.1111/bjep.12377>
- Collie, R. J., Shapka, J. D., Perry, N. E., & Martin, A. J. (2016). Teachers' psychological functioning in the workplace: Exploring the roles of contextual beliefs, need satisfaction, and personal characteristics. *Journal of Educational Psychology*, *108*(6), 788–799. <https://doi.org/10.1037/edu0000088>
- De Clercq, M., Watt, H. M. G., & Richardson, P. W. (2021). Profiles of teachers' striving and wellbeing: Evolution and relations with context factors, retention, and professional engagement. *Journal of Educational Psychology*. Published.
<https://doi.org/10.1037/edu0000702>
- De Ruiter, N. M., Van der Gaag, M. A., Jeronimus, B. F., & Kunnen, E. S. (2019). Introduction to a dynamic systems approach to psychosocial development in adolescence. In *Psychosocial Development in Adolescence* (pp. 1-16). Routledge.
- Den Brok, P., Wubbels, T., & Van Tartwijk, J. (2017). Exploring beginning teachers' attrition in the Netherlands. *Teachers and Teaching*, *23*(8), 881–895.
<https://doi.org/10.1080/13540602.2017.1360859>
- Dicke, T., Parker, P. D., Holzberger, D., Kunina-Habenicht, O., Kunter, M., & Leutner, D. (2015). Beginning teachers' efficacy and emotional exhaustion: Latent changes, reciprocity, and the influence of professional knowledge. *Contemporary Educational Psychology*, *41*, 62–72. <https://doi.org/10.1016/j.cedpsych.2014.11.003>

- Dollansky, T. D. (2013). The importance of the beginning teachers' psychological contract: a pathway toward flourishing in schools. *International Journal of Leadership in Education*, 17(4), 442–461. <https://doi.org/10.1080/13603124.2013.825012>
- Ebersold, S., Rahm, T., & Heise, E. (2019). Autonomy support and well-being in teachers: differential mediations through basic psychological need satisfaction and frustration. *Social Psychology of Education*, 22(4), 921–942.
- Evelein, F., Korthagen, F., & Brekelmans, M. (2008). Fulfilment of the basic psychological needs of student teachers during their first teaching experiences. *Teaching and Teacher Education*, 24(5), 1137–1148. <https://doi.org/10.1016/j.tate.2007.09.001>
- Fisher, A. J., Medaglia, J. D., & Jeronimus, B. F. (2018). Lack of group-to-individual generalizability is a threat to human subjects research. *Proceedings of the National Academy of Sciences*, 115(27), E6106–E6115. <https://doi.org/10.1073/pnas.1711978115>
- Fisher, C. D., & To, M. L. (2012). Using experience sampling methodology in organizational behavior. *Journal of Organizational Behavior*, 33(7), 865–877. <https://doi.org/10.1002/job.1803>
- Fore, C., Martin, C., & Bender, W. N. (2002). Teacher Burnout In Special Education: The Causes and The Recommended Solutions. *The High School Journal*, 86(1), 36–44. <https://doi.org/10.1353/hsj.2002.0017>
- Gagné, M., & Deci, E. L. (2005). Self-determination theory and work motivation. *Journal of Organizational Behavior*, 26(4), 331–362. <https://doi.org/10.1002/job.322>

- Hammerness, K. (2008). "If You Don't Know Where You Are Going, Any Path Will Do": The Role of Teachers' Visions in Teachers' Career Paths. *The New Educator*, 4(1), 1–22. <https://doi.org/10.1080/15476880701829184>
- Hektner, J. M., Schmidt, J. A., & Csikszentmihalyi, M. (2011). *Experience Sampling Method*. SAGE Publications. <https://dx.doi.org/10.4135/9781412984201>
- Helms-Lorenz, M., & Maulana, R. (2015). Influencing the psychological well-being of beginning teachers across three years of teaching: self-efficacy, stress causes, job tension and job discontent. *Educational Psychology*, 36(3), 569–594. <https://doi.org/10.1080/01443410.2015.1008403>
- Hobson, A. J., & Maxwell, B. (2017). Supporting and inhibiting the well-being of early career secondary school teachers: Extending self-determination theory. *British Educational Research Journal*, 43(1), 168–191. <https://doi.org/10.1002/berj.3261>
- Karanfil, F., & Atay, D. (2020). The Well-Being of Novice State School Teachers in the Mentoring Programme in Turkey: A Narrative Inquiry. *Shanlax International Journal of Education*, 9(1), 56–67. <https://doi.org/10.34293/education.v9i1.3438>
- Kutsyruba, B., Walker, K. D., Stasel, R. S., & Al Makhamreh, M. (2019). Developing resilience and promoting well-being in early career teaching: Advice from the Canadian beginning teachers. *Canadian Journal of Education*, 42(1), 285–321.
- Lindqvist, P., Nordänger, U. K., & Carlsson, R. (2014). Teacher attrition the first five years – A multifaceted image. *Teaching and Teacher Education*, 40, 94–103. <https://doi.org/10.1016/j.tate.2014.02.005>

- Larson, R., & Csikszentmihalyi, M. (2014). The Experience Sampling Method. In *Flow and the foundations of positive psychology: The collected works of Mihalyi Csikszentmihalyi* (pp. 21–34). Springer.
- Loopers, J. H., Kupers, W. E., De Boer, A. A., & Minnaert, A. E. M. G. (2022). Individual Differences in The Relationship Between Basic Psychological Need Satisfaction and Intrinsic Motivation and the Role of Special Educational Needs [Manuscript submitted for publication]. Department of Inclusive and Special Needs Education. University of Groningen
- Manganelli, L., Thibault-Landry, A., Forest, J., & Carpentier, J. (2018). Self-Determination Theory Can Help You Generate Performance and Well-Being in the Workplace: A Review of the Literature. *Advances in Developing Human Resources*, 20(2), 227–240. <https://doi.org/10.1177/1523422318757210>
- Miller, M. D., Brownell, M. T., & Smith, S. W. (1999). Factors That Predict Teachers Staying in, Leaving, or Transferring from the Special Education Classroom. *Exceptional Children*, 65(2), 201–218. <https://doi.org/10.1177/001440299906500206>
- Molenaar, P. C., & Campbell, C. G. (2009). The New Person-Specific Paradigm in Psychology. *Current Directions in Psychological Science*, 18(2), 112–117. <https://doi.org/10.1111/j.1467-8721.2009.01619>
- Ohly, S., Sonnentag, S., Niessen, C., & Zapf, D. (2010). Diary Studies in Organizational Research. *Journal of Personnel Psychology*, 9(2), 79–93. <https://doi.org/10.1027/1866-5888/a000009>
- Osborne, Jason W. (2000) "Advantages of Hierarchical Linear Modeling," Practical Assessment, Research, and Evaluation: Vol. 7 , Article 1. <https://doi.org/10.7275/pmgn-zx89>

- Peugh, J. L. (2010). A practical guide to multilevel modeling. *Journal of School Psychology, 48*(1), 85–112. <https://doi.org/10.1016/j.jsp.2009.09.002>
- Reis, H. T., Sheldon, K. M., Gable, S. L., Roscoe, J., & Ryan, R. M. (2000). Daily Well-Being: The Role of Autonomy, Competence, and Relatedness. *Personality and Social Psychology Bulletin, 26*(4), 419–435. <https://doi.org/10.1177/0146167200266002>
- Rossi, P. H., Lipsey, M. W., & Henry, G. T. (2019). *Evaluation: A Systematic Approach* (8ste editie). SAGE Publications, Inc.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*(1), 68–78. <https://doi.org/10.1037/0003-066x.55.1.68>
- Simbula, S. (2010). Daily fluctuations in teachers' well-being: a diary study using the Job Demands–Resources model. *Anxiety, Stress & Coping, 23*(5), 563–584. <https://doi.org/10.1080/10615801003728273>
- Stempien, L. R., & Loeb, R. C. (2002). Differences in Job Satisfaction Between General Education and Special Education Teachers. *Remedial and Special Education, 23*(5), 258–267. <https://doi.org/10.1177/07419325020230050101>
- Van den Broeck, A., Ferris, D. L., Chang, C. H., & Rosen, C. C. (2016). A Review of Self-Determination Theory's Basic Psychological Needs at Work. *Journal of Management, 42*(5), 1195–1229. <https://doi.org/10.1177/0149206316632058>
- Van der Krieke, L., Blaauw, F. J., Emerencia, A. C., Schenk, H. M., Slaets, J. P., Bos, E. H., De Jonge, P., & Jeronimus, B. F. (2017). Temporal Dynamics of Health and Well-Being: A Crowdsourcing Approach to Momentary Assessments and Automated

- Generation of Personalized Feedback. *Psychosomatic Medicine*, 79(2), 213–223.
<https://doi.org/10.1097/psy.0000000000000378>
- Van Katwyk, P. T., Fox, S., Spector, P. E., & Kelloway, E. K. (2000). Using the Job-Related Affective Well-Being Scale (JAWS) to investigate affective responses to work stressors. *Journal of occupational health psychology*, 5(2), 219.
- Wang, H., Hall, N. C., & Rahimi, S. (2015). Self-efficacy and causal attributions in teachers: Effects on burnout, job satisfaction, illness, and quitting intentions. *Teaching and Teacher Education*, 47, 120–130. <https://doi.org/10.1016/j.tate.2014.12.005>
- Whitaker, S. D. (2001). Supporting Beginning Special Education Teachers. *Focus on Exceptional Children*, 34(4). <https://doi.org/10.17161/fec.v34i4.6787>
- Whitaker, S. D. (2003). Needs of Beginning Special Education Teachers: Implications for Teacher Education. *Teacher Education and Special Education: The Journal of the Teacher Education Division of the Council for Exceptional Children*, 26(2), 106–117.
<https://doi.org/10.1177/088840640302600204>
- Wu, T. J., Wang, L. Y., Ga, J. Y., & Wei, A. P. (2020). Social Support and Well-Being of Chinese Special Education Teachers—An Emotional Lab or Perspective. *International Journal of Environmental Research and Public Health*, 17(18), 6884.
<https://doi.org/10.3390/ijerph17186884>
- Xanthopoulou, D., Bakker, A. B., & Ilies, R. (2012). Everyday working life: Explaining within-person fluctuations in employee well-being. *Human Relations*, 65(9), 1051–1069. <https://doi.org/10.1177/0018726712451283>
- Xu, N., Chen, P., Lang, R., Kong, L. L., & Qu, H. Y. (2021). The Effect of Chinese Special Education Teachers' Competence on Their Occupational Well-Being: The Mediating

Effect of Resilience. *International Journal of Disability, Development and Education*,
1–16. <https://doi.org/10.1080/1034912x.2021.1975263>

Appendix A

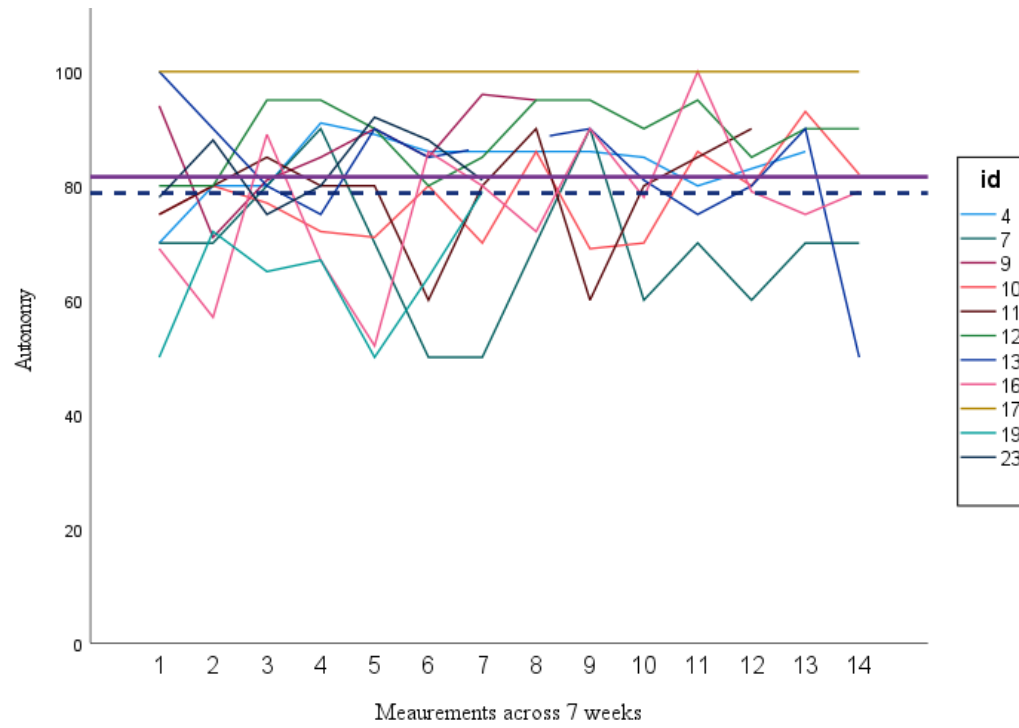


Figure 1. Autonomy of individual teachers in primary education over time.
Horizontal purple line = group mean, horizontal blue line = mean overall

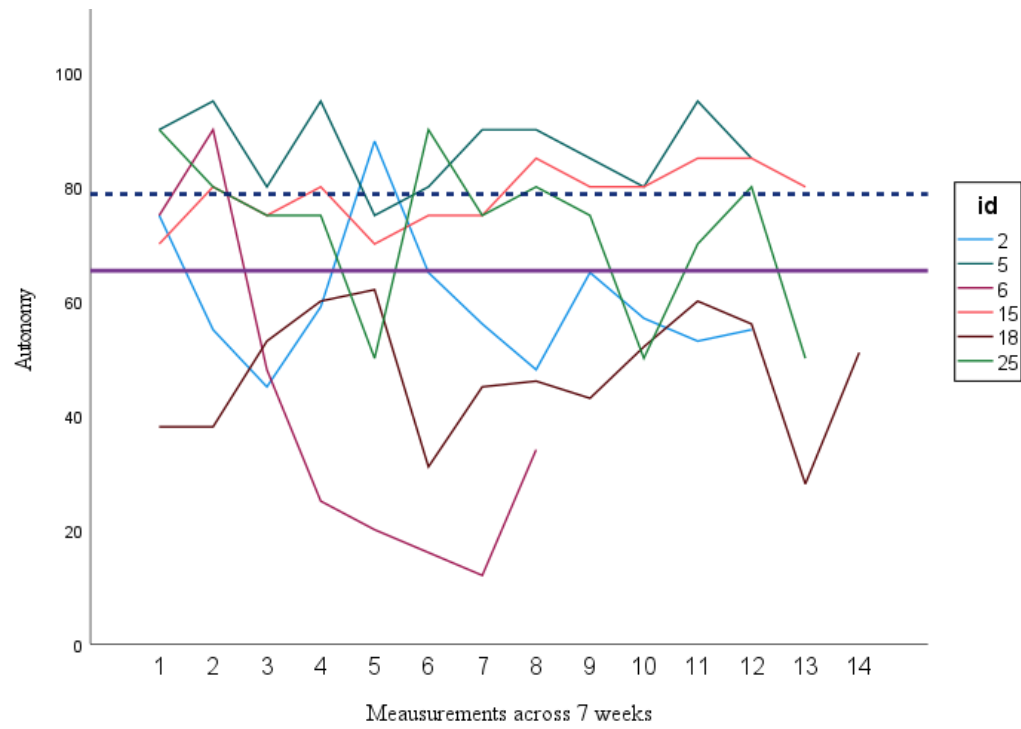


Figure 2. Autonomy of individual teachers in secondary education over time.
 Horizontal purple line = group mean, horizontal blue line = mean overall

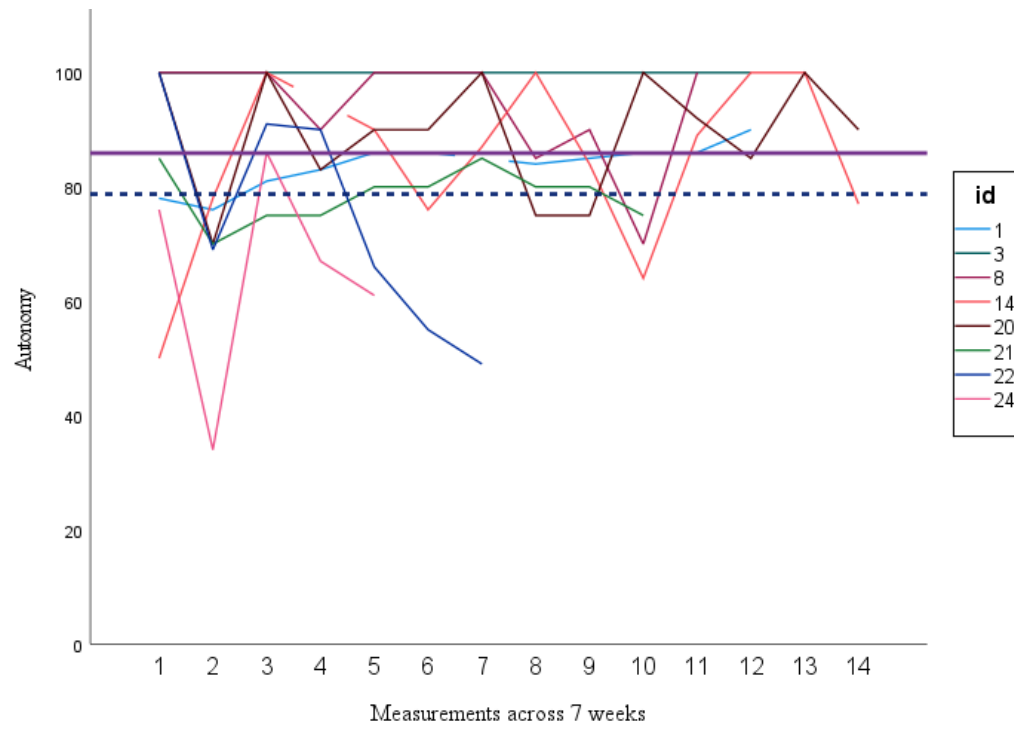


Figure 3. Autonomy of individual teachers in special education over time. Horizontal purple line = group mean, horizontal blue line = mean overall

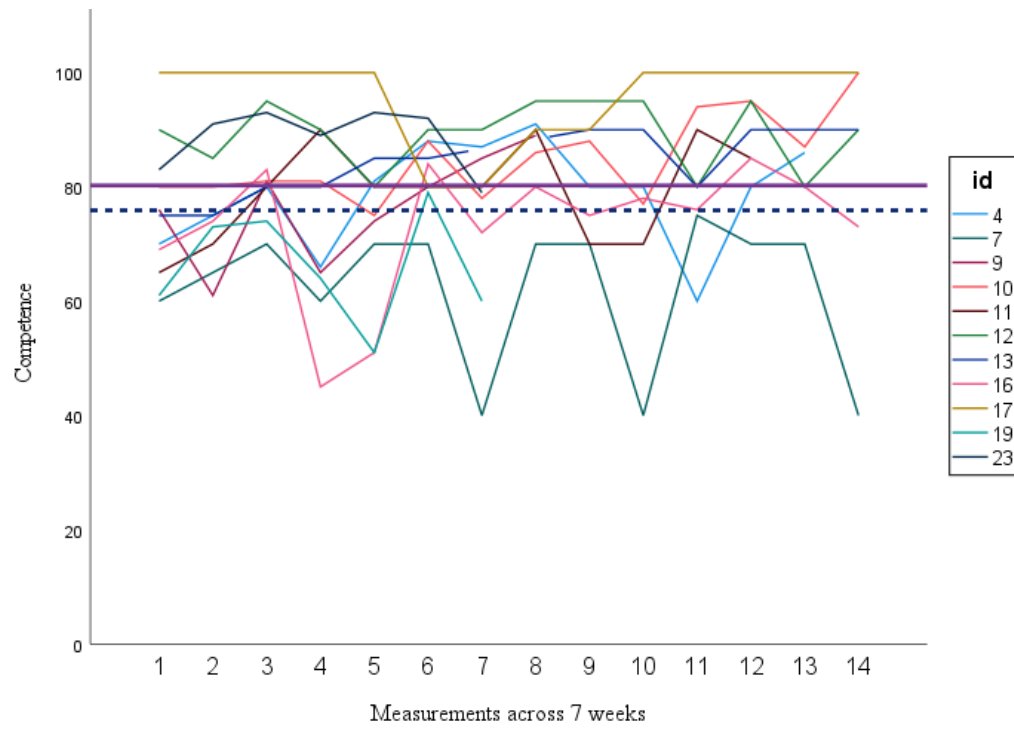


Figure 4. Competence of individual teachers in primary education over time. Horizontal purple line = group mean, horizontal blue line = mean overall

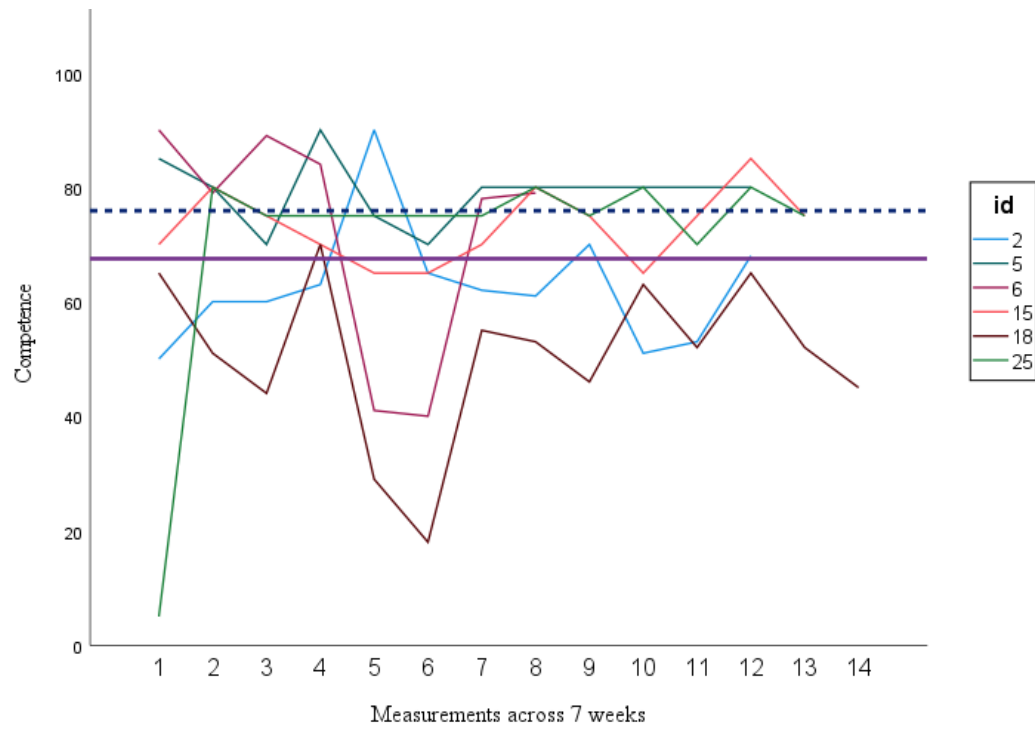


Figure 5. Competence of individual teachers in secondary education over time. Horizontal purple line = group mean, horizontal blue line = mean overall

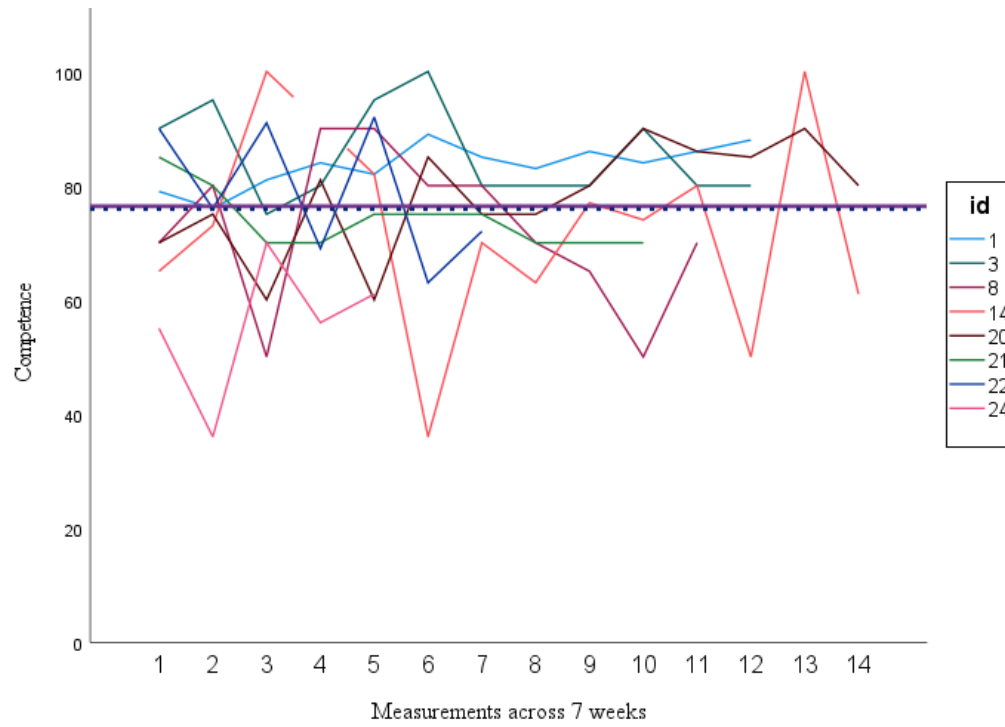


Figure 6. Competence of individual teachers in special education over time. Horizontal purple line = group mean, horizontal blue line = mean overall

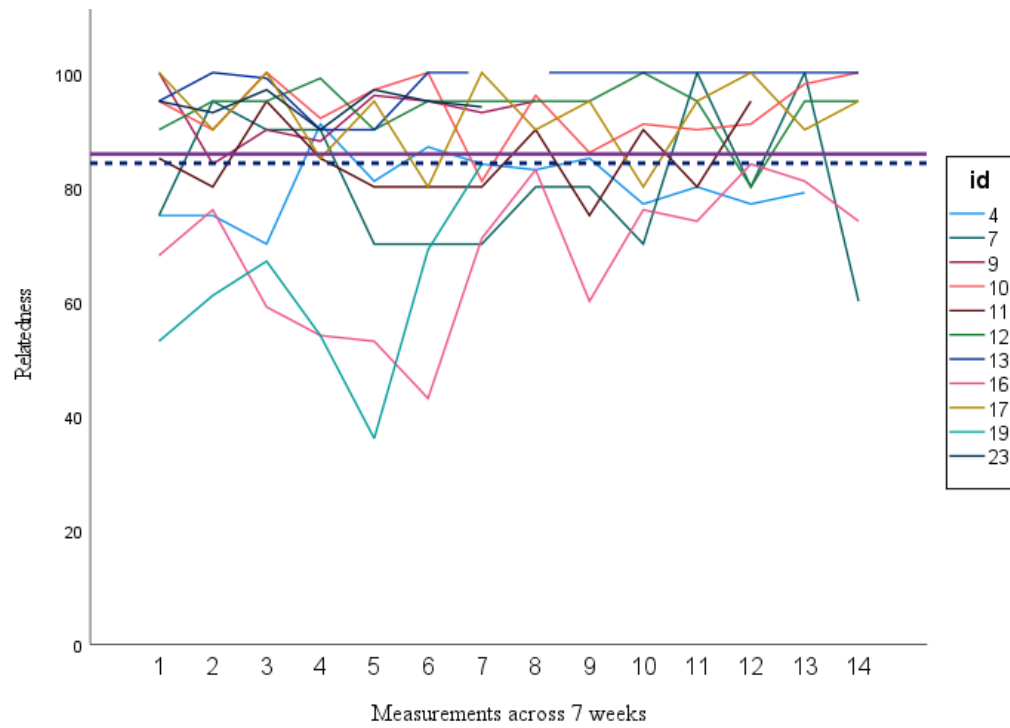


Figure 7. Relatedness of individual teachers in primary education over time. Horizontal purple line = group mean, horizontal blue line = mean overall

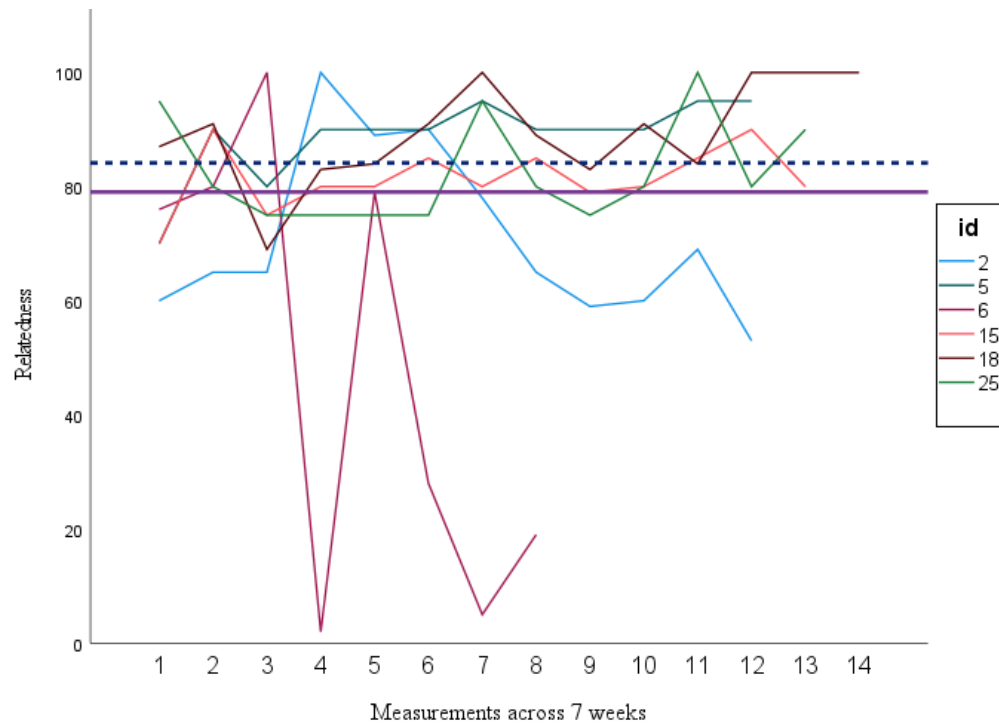


Figure 8. Relatedness of individual teachers in secondary education over time. Horizontal purple line = group mean, horizontal blue line = mean overall

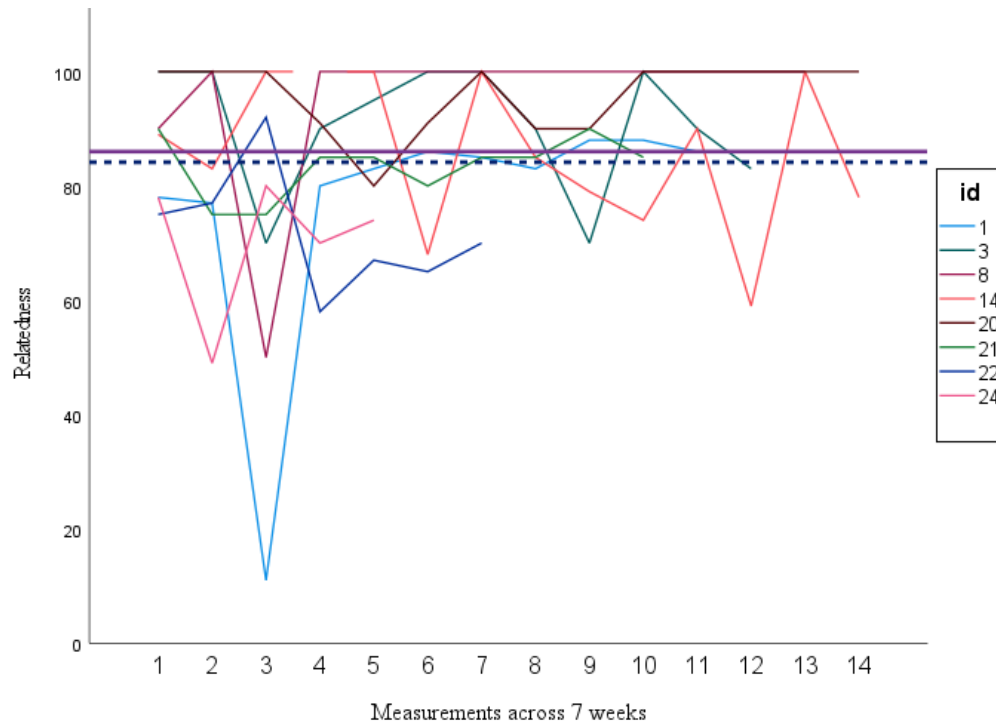


Figure 9. Relatedness of individual teachers in special education over time. Horizontal purple line = group mean, horizontal blue line = mean overall

Appendix B

Normality

Table 4

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
auto	,133	284	<,001	,910	284	<,001

Note: Test of normality for the distribution of the independent variable autonomy. When $p < .001$ (Kolmogorov-Smirnov or Shapiro-wilk), the assumption of normality is violated.

Table 5

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
com	,124	285	<,001	,932	285	<,001

Note: Test of normality for the distribution of the independent variable competence. When $p < .001$ (Kolmogorov-Smirnov or Shapiro-wilk), the assumption of normality is violated.

Table 6

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
rel	,158	287	<,001	,824	287	<,001

Note: Test of normality for the distribution of the independent variable relatedness. When $p < .001$ (Kolmogorov-Smirnov or Shapiro-wilk), the assumption of normality is violated.

Table 7
Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
well-being	,110	285	<,001	,939	285	<,001

Note: Test of normality for the distribution of the dependent variable well-being. When $p < .001$ (Kolmogorov-Smirnov or Shapiro-wilk), the assumption of normality is violated.

Table 8
Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Standardized Residual	,106	284	<,001	,925	284	<,001

Note: Test of normality for the distribution of the residual of the dependent variable well-being. When $p < .001$ (Kolmogorov-Smirnov or Shapiro-wilk), the assumption of normality is violated.

Table 9
Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Absolute difference_well-being	,197	265	<,001	,756	265	<,001

Note: Test of normality for the distribution of the dependent variable mean difference in well-being. When $p < .001$ (Kolmogorov-Smirnov or Shapiro-wilk), the assumption for normality is violated.

Homoscedasticity

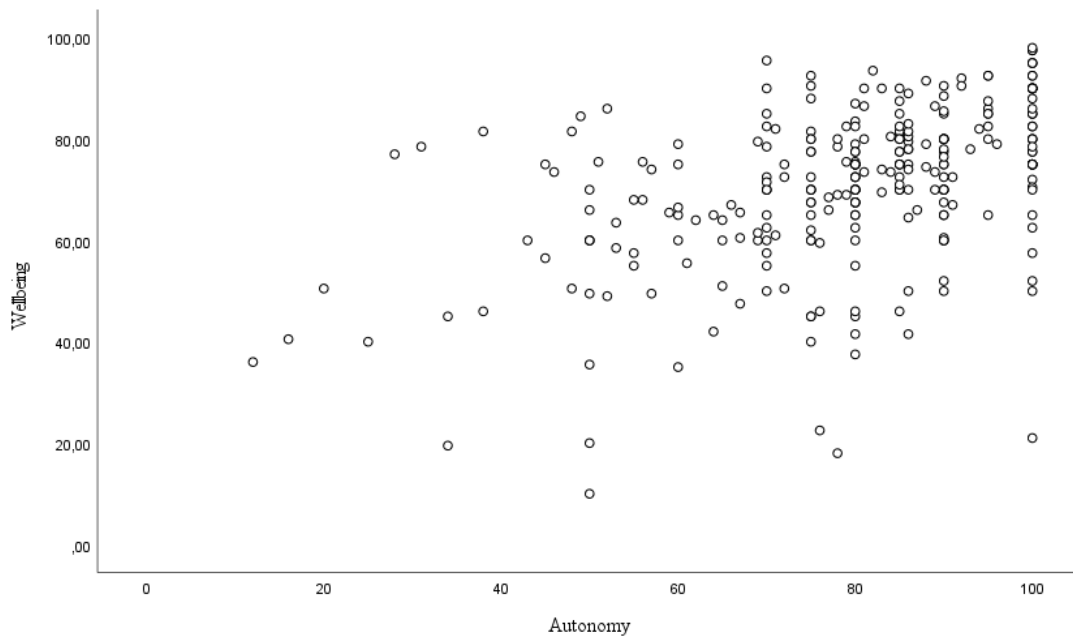


Figure 15. The scatterplot of the independent variable autonomy and the dependent variable well-being. The assumption of homoscedasticity is violated when the distribution of data is not random.

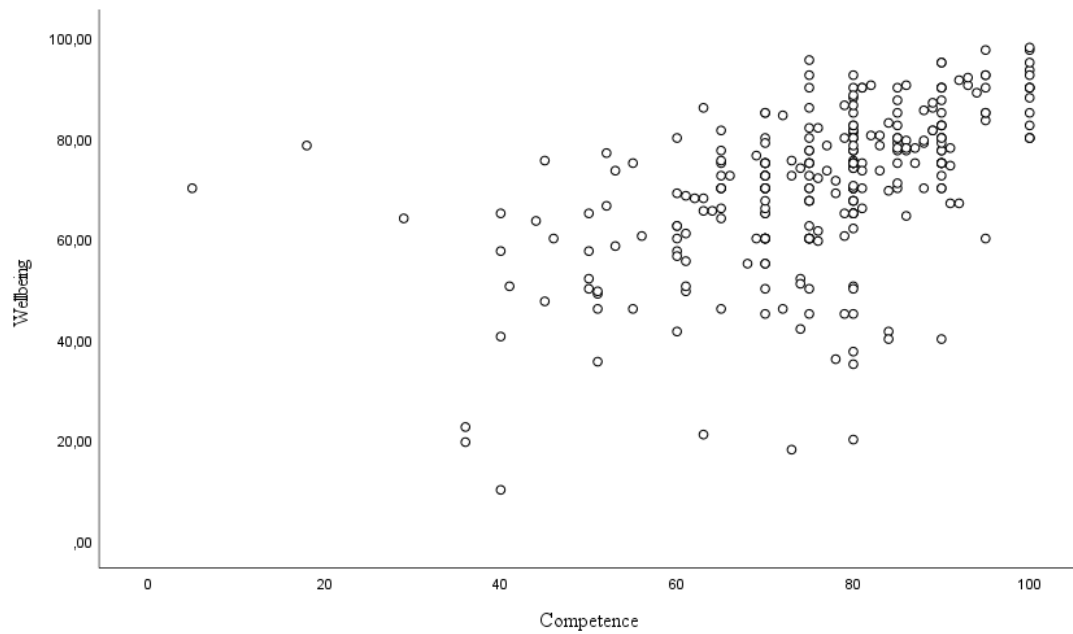


Figure 16. The scatterplot of the independent variable competence and the dependent variable well-being. The assumption of homoscedasticity is violated when the distribution of data is not random.

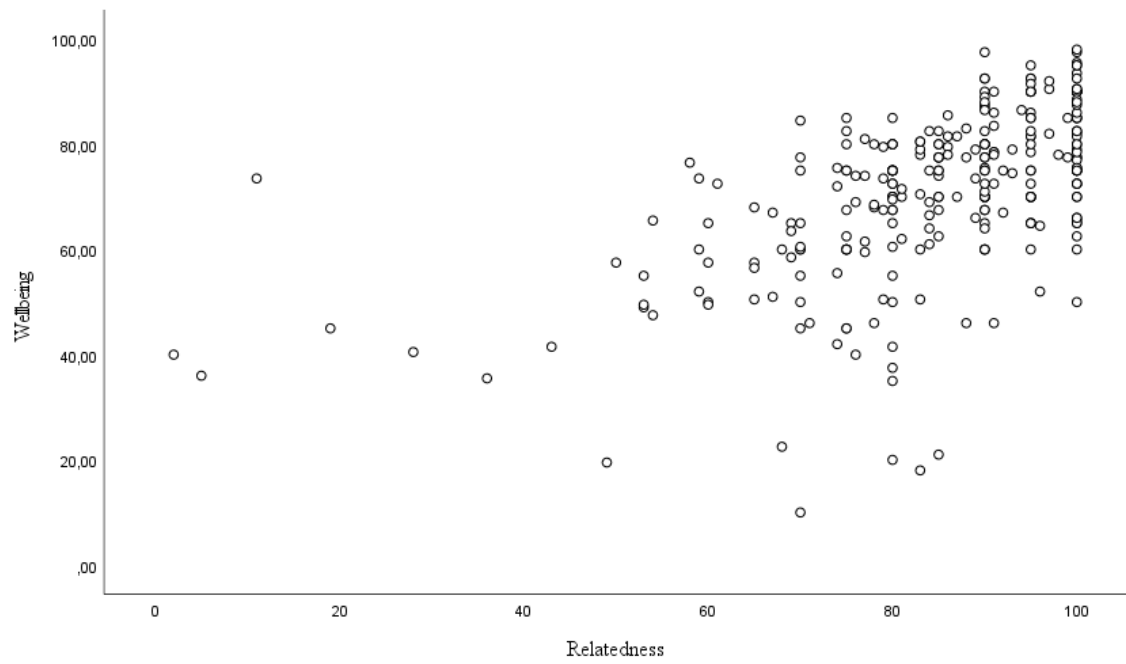


Figure 17. The scatterplot of the independent variable competence and the dependent variable well-being. The assumption of homoscedasticity is violated when the distribution of the data is not random

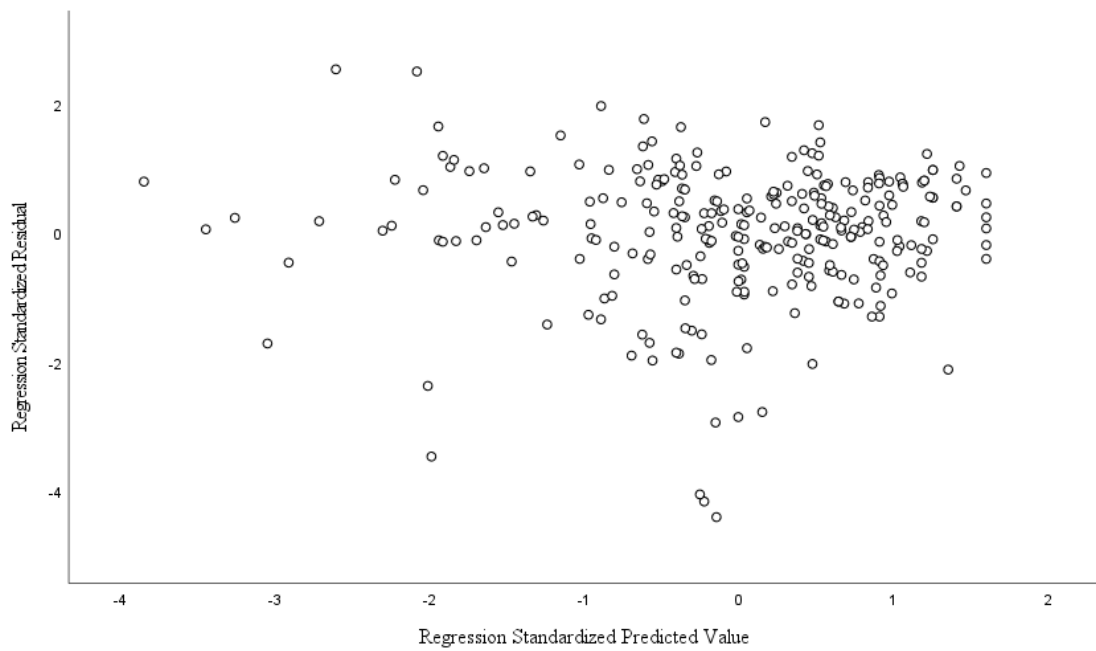


Figure 18. The scatterplot of the residuals of the independent variable well-being. The assumption of homoscedasticity is violated when the distribution of data is not random.

Homoscedasticity

Table 10

Levene's test of homogeneity of variances

		Levene	df1	df2	Sig.
		Statistic			
well-being	Based on Mean	1,950	2	282	,144
	Based on Median	1,590	2	282	,206
	Based on Median and with adjusted df	1,590	2	261,490	,206
	Based on trimmed mean	1,712	2	282	,182

Note: Test for equal variances across PE, SE and special education teachers. $p < .05$ the assumption of homoscedasticity is violated.

Table 11

Levene's Test of Homogeneity of variances

		Levene	df1	df2	Sig.
		Statistic			
abs_wbdif	Based on Mean	12,681	2	262	<,001
	Based on Median	5,712	2	262	,004
	Based on Median and with adjusted df	5,712	2	206,844	,004
	Based on trimmed mean	10,064	2	262	<,001

Note: Test for equal variances across PE, SE and special education teachers. $p < .05$ the assumption of homoscedasticity is violated.