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Exploring the Relationship between Personal Growth, Daily Stressors and Optimism in Daily Life: An Experience Sampling Study

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Abstract

Background: Research on personal growth has predominantly focused on traumatic events, leaving minor stressors, such as daily stressors, understudied. However, recent findings suggest that subjective stressors can potentially contribute to personal growth. Furthermore, optimism, a psychological trait associated with positive outcomes, has been found to be positively correlated with personal growth. Moreover, optimism may act as a psychological buffer, mitigating the impact of stressors and offering resilience against perceived stress. **Method:** This study employs an Experience Sampling Method (ESM) to collect data within the everyday lives of individuals, providing a rich and dynamic perspective on the subject matter. To gather data on the relevant constructs of daily stressors, personal growth and optimism, participants had to fill out daily questionnaires to assess their state measure. The daily questionnaires were administered five times a day, over the duration of 10 days. The findings of this study were analyzed with a Linear Mixed Model. **Results:** The main findings of this study indicate a statistically significant moderate positive relationship between daily stressors and personal growth (β=.50, p<.001). However, it was found that optimism does not significantly moderate the association between daily stressors and personal growth (β=-.04, p=.12). **Conclusion:** This research highlights the potential for personal growth to emerge from the experience of daily stressors. However, despite examining the interplay between these three constructs, no significant moderation effect of optimism on the relationship between daily stressors and personal growth was found. Future research should consider exploring additional contextual factors such as socio-economic status that may influence this complex relationship further, as well as a broader sample to enhance the generalizability of findings.

Keywords: Experience Sampling Method (ESM), Personal growth, Daily stressors, Optimism.

Exploring the Relationship between Personal Growth, Daily Stressors and Optimism in

Daily Life: An Experience Sampling Study

In life, everyone is driven by purpose, direction, and goals across various domains, including career, personal life, or relationships. The aspiration for personal development is the essence of personal growth. Personal growth can be defined as "The experience of a continues development, including the realization of one's potential, the openness for new experiences, an improvement in self and behaviour and an increase in self-knowledge and personal reflection" (Ryff & Keyes, 1995, p. 1). Research suggests that personal growth can lead to potential mental health benefits for an individual (Robitschek & Keyes, 2009). Besides, a study by Hasan et al. (2015) suggests that personal growth is associated with subjective well-being and adaptive functioning. To illustrate further, a study by Ryff and Singer (2008) demonstrated a link between personal growth and favourable outcomes such as higher levels of good cholesterol and improved psychological well-being. These findings collectively highlight the positive impact of personal growth on various aspects of individuals' lives, including mental health, well-being, and physical health. Besides the possible positive implications of personal growth for an individual, research also investigated factors contributing to personal growth. A study by Tedeschi & Calhoun (2004) has investigated and shown that factors such as meaning-making, positive emotions and social support can positively contribute to personal growth. Contributing factors for personal growth have also been shown to be intrinsic motivation of an individual as well as a sense of safety, a safe environment within one can thrive (Deci & Ryan, 2000). Lastly, research by Tedeschi and Calhoun (2004) suggests that personal growth can emerge from being confronted by subjective stressors, such as daily stressors.

Daily Stressors

Daily stressors are experienced by almost everyone every day. Being confronted by multiple challenges each day can have a negative impact on the individual's mental health

(Beasley et al., 2003; Brand et al., 2000). Daily stressors can include interpersonal issues with a family member or friends as well as performance-related issues at work or school (LoSavio et al., 2011). Daily stressors can be defined as ''Daily stressors (or "hassles") are minor stressors that occur with greater frequency and represent proximal aspects of stress in individuals' daily lives and environments'' (Stawski et al., 2008, p.1). The negative impact daily stressors can have include physical health issues such as headache, back pain (Charles & Almeida, 2006), or fatigue (Zohar, 1999) as well as negative implications on psychological well-being and an individual's mental health (Pinquart & Sörensen, 2003). Moreover, research concerning daily events also revealed that daily stressors can influence internal states of an individual, such as mood, as research by Gabel et al. (2000) has shown. They found that the experience of daily stressors leads to an increase in negative affect. Research by Nezlek & Plesko (2001) supports this, as they also found that daily negative events influence an individual's mood.

Research on personal growth has mostly focused on growth following trauma or life crises while giving less attention to the potential for growth after more minor daily stressors. For instance, a study by Cordova et al. (2001) compared levels of growth between women with breast cancer, a significant trauma, and a control group without the illness. The findings revealed that women with breast cancer reported higher levels of perceived growth compared to the control group. Dealing with cancer can be seen as a traumatic event but also a subjective stressor, as it carries numerous negative implications for the individual, and thus increase subjective levels of perceived stress (Shen, 2020). Interestingly, research by Tedeschi and Calhoun (2004) suggests that personal growth can emerge from being confronted by subjective stressors. When individuals are confronted with stressors, they experience distress. This distress can prompt adaptation to the situation, potentially leading to positive psychological changes within the individual. Such changes may include enhanced resilience, a greater appreciation for small things, and increased confidence in handling difficult

situations (Tedeschi & Calhoun, 2004). This implies that by facing adversity or daily stressors, including experiences of negativity, individuals can still experience personal growth. As it is argued that personal growth can result from subjective stressors, which do not necessarily have to be traumatic experiences, this research aims to examine whether individuals may also experience personal growth as a consequence of less severe stressors but more frequent and minor daily stressors.

Optimism

Individuals' perspectives or attitudes towards life and events that take place every day can vary in terms of optimism or pessimism, differing from one person to another. Optimism can be defined as ''The extent to which people hold generalized favourable expectancies for their future'' (Carver et al., 2010, p.1). A distinct definition by Tiger (1979, p.18) is "A mood or attitude associated with an expectation about the social or material future – one which the evaluator regards as socially desirable, to his [or her] advantage, or for his [or her] pleasure". Individuals with an optimistic outlook tend to expect positive outcomes, which results in the experience of a variety of positive feelings (Carver & Scheier, 1998).

Research has found evidence that optimism is related to better physiological health. Much research focuses on cardiovascular health (Segerstrom et al., 2017) such as the relation of optimism and lower cortisol levels in response to stress (Jobin, 2014) as well as lower likelihood of developing coronary heart disease (Kubzansky, 2001). Overall, it seems that optimism is associated with good physical well-being (Segerstrom et al., 2017). Moreover, it has not only been linked to better physical health but also better psychological health such as subjective well-being (Carver et al., 2010) and lower depressive symptoms (Hart, 2008). Especially in times of adversity, it seems that optimism is related to better well-being among individuals (Caver et al., 2010). Besides the better physical and psychological health of individuals who score high on optimism, optimism also seems to prevent the reoccurrence of psychopathology, as it increases resilience to stressful events that are associated with the risk

of onset and relapse of psychopathology (Carver et al., 2010). Considering that being optimistic seems to benefit an individual in multiple domains.

Research has been conducted on the domain of personal growth and optimism, revealing valuable insights into their association. A study conducted by Ain (2019) investigated the relationship between optimism and personal growth initiative. The findings of this study indicate a positive association between optimism and personal growth initiative. This relation is expected as individuals with higher levels of optimism tend to have a more positive outlook on various aspects of life, including their health and overall well-being. Furthermore, the significance of optimism in fostering personal growth is further supported by a study conducted by Taubman–Ben-Ari et al. (2018) focusing on new fathers. The research examined the association between optimism and personal growth among this specific group. The results revealed that optimism was positively related to greater personal growth in new fathers. These findings highlight the role of optimism as a catalyst for personal growth, suggesting that having an optimistic mindset can contribute to the development of new skills, positive psychological changes, and an overall sense of growth.

Next to that domain, research also focused on optimism and its association with negative events or stressors. Segerstrom et al. (2017), argue that optimism may be related to the reduction of the experience of negative events. To strengthen this argument, literature suggests that individuals who score high in optimism are less reactive to daily stressors. Optimism, in this case, acts as a psychological buffer against perceived stress (Majeed et al., 2021). To add on that, a study conducted by Lai (2009) explored the possible influence of dispositional optimism in moderating the association of daily hassles on the mental well-being of Chinese adolescents. The results revealed that optimism played a crucial role in buffering the perceived stress experienced by the participants. This effect can potentially be explained by the more positive perception of more optimistic individuals when confronted with stressors. For example, believing that one's problems will be resolved anyway, may account

for less of a negative impact of stressors on that individual (Banerjee, 2012), and thus a reduced experience of perceived stressors.

Given the established positive association between optimism and personal growth, along with evidence suggesting that optimism can mitigate the impact of stressors and serve as a psychological buffer against perceived stress, this study aims to explore the relation between personal growth and daily stressors as well as the moderating role of optimism.

Current Study

Based on previous research and literature on the constructs and association of personal growth, daily stressors and optimism, this study will investigate the following research questions and hypotheses. *RQ: How are daily stressors and optimism associated with personal growth over time? Hypothesis 1: Daily stressors are positively associated with personal growth. Hypothesis 2: Optimism positively moderates the association between daily stressors and personal growth.*

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Methods

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Participants

Participants of this study were recruited via convenience sampling. Convenience sampling is a form of nonprobability sampling where participants are chosen on criteria such as availability to the researcher, or the willingness to participate in the given study (Etikan et al., 2016). Participants had to fulfil the criteria of a sufficient level of English, the availability of using and ability to use a mobile phone as well as an internet connection throughout the day. The study aimed for at least 19 participants as, according to Van Berkel et al. (2017) this is a sufficient number of participants for an ESM study.

Design

In order to measure the constructs of optimism, personal growth, and daily stressors as well as their relation an Experience Sampling Method (ESM) was chosen. This study design allows for the assessment of temporary changes and state measures (Beal & Weiss, 2003).

Furthermore, an ESM design provides the opportunity of gathering information on behaviours and individual experiences which take place in everyday life (Verhagen et al., 2016), as well as the assessment of changes in psychological states which can happen spontaneously and abruptly within the individual (Bolger et al., 2003). The current study was part of a larger study conducted in collaboration with four other researchers from the University of Twente.

Procedure

First, the study was approved by the Ethics Committee of Behavioral, Management and Social Sciences of the University of Twente with the proposal number 230092. After receiving approval, the study was designed and set up in 'Ethica Data', an online platform for conducting research. To ensure that the study is set up correctly a pilot test was run for one day.

In order for participants to start with the study, and start the data-gathering process, the researchers send an email or a text message to each of the participants with an invitation to the study. Additionally, they were informed to download the app 'Ethica' in order to participate via their mobile phone. Alongside the invitation, participants were presented with an online informed consent for the study (See appendix A). The day on which data collection began was March 22, 2023, and ended on April 17, 2023, representing 26 days of potential data collection. Nonetheless, data collection for each participant totaled 10 days after starting.

The first questionnaire that had to be answered was a baseline questionnaire assessing the participants' demographics (See appendix B). Next, the participants state measures were assessed, by them answering the daily questionnaires on optimism, personal growth, and daily stressor. The daily questionnaires were triggered at pre-defined time intervals, five times a day, via push messages by the app 'Ethica' over the course of 10 days. The first daily questionnaire was triggered at 10 AM. The second trigger point was at 1 PM. The third one at 4 PM. The fourth trigger point was set at 7 AM and the last one at 10 PM. Participants were provided with a one-hour window to complete the questionnaires before they expired,

ensuring a timely response. To enhance compliance, one reminder per answering period in the form of push messages was sent to participants, encouraging them to participate and complete the questionnaires.

Materials

*D*aily Questionnaires

Daily Stressor During a 10-day duration, participants were administered a single item to measure the presence of any stressors they experienced in their daily lives. The item was found in an online database for ESM studies, the 'ESM item repository'. The item namely is 'Think of the most striking event or activity in the last hour. How stressful was this event or activity?'. The item had to be answered on a -3 *(very unpleasant)* to +3 *(very pleasant)* scale (See appendix C).

Optimism To measure to what extent participants make use of optimism throughout the day one item was designed and chosen. The chosen item was a modified version of an item from the Revised Life Orientation Test (LOT-R) originally developed by Scheier and Carver (1985). The LOT-R is a widely used tool to assess state optimism (Millstein et al., 2019) but in this study, the item was adapted to align with the ESM design of the study. The item namely is 'In the last hour I felt optimistic', and had to be answered on a 7-point Likert scale, ranging from 1 (*totally disagree*) to 7 (*totally agree*) (See appendix D).

Personal Growth To measure to what extent participants experience personal growth within their daily lives, two items were designed and chosen. One item particularly for this study was designed, based on the definition of personal growth which was chosen in this study. The item namely is 'In the last hour I felt capable of handling difficulties'. The second item that was administered was a modification of an item of the Posttraumatic Growth Inventory Short Form (PTGI-SF). This scale was developed by Tedeschi & Calhoun (1996) and is one of the most common scales used to measure personal growth (Garrido-Hernansaiz et al., 2022). The modified item stated, 'In the last hour, I felt that life is a continues process

of learning, changing and growth'. Both items had to be answered on a 7-point Likert scale ranging from 1 (*totally disagree*) to 7 (*totally agree*) (See appendix E). The items showed poor reliability ($\alpha = .54$).

Analysis

To analyze the collected data the statistical program IBM SPSS Statistics version 26 was used. First, the dataset was imported into SPSS. Secondly, participants with a response rate lower than 30% were excluded from the dataset (Carter, 2016). Thirdly to check whether data is missing at random the Little's Missing Completely at Random (MCAR) test was performed (Li, 2013). Fourthly, inter-correlations for the trait and state measures were calculated. Fifthly, person mean scores, as well as person mean centered scores were computed for all items. Lastly, for a visual representation of the relation between, optimism, daily stressor and personal growth as well as participants within variability of those constructs, line plots and boxplots were created.

To answer the research questions of this longitudinal design study, a linear mixed model (LMM) was used. Administering a LMM to analyze data from an experienced sampling study was chosen, as this model accounts for nested data (Schielzeth & Nakagawa, 2013). Nested data results from multiple measurement points per participant which results in multi-level data structures (Schielzeth & Nakagawa, 2013). Moreover, for the LMM an autoregressive covariance structure (AR1) was chosen, as it suggests that with time passing, correlations will decrease (Barnett et al., 2010).

To answer the first hypothesis, which investigates the association between daily stressor and personal growth, an LMM was run. In this analysis, daily stressor was treated as the independent variable and personal growth as the dependent variable. For both variables, the person mean centered scores were used, and one main effect was administered within the analysis. For the second hypothesis, an LMM was also run. Within this analysis, personal growth was treated as the dependent variable and daily stressor as well as optimism were

treated as the independent variable. For all variables, the person mean centered scores of state measures were used. As this hypothesis investigates a possible moderation, an interaction effect for the independent variables was added to the two main effects. Moreover, within both analyses ID was treated as subject and time as repeated effect. To illustrate the findings of the main analysis, individual cases of participants were plotted and visually displayed.

Results

The total number of participants in this study was 48. Due to a response rate lower than 30%, 26 participants had to be excluded, hence the final sample consisted of a total of 22 participants. The MCAR revealed that data is missing completely at random χ^2 (6) = 5.82, p = .44. The age of the participants ranged from 19 to 54 with a mean age of 24.90 (SD=6.91). Most participants were German (81.8%) as well as female (77.3%). More participant data such as educational level or age can be found in Table 1.

Table 1

Sample Characteristics

		N	%
Gender	Female	17	77.3
	Male	5	22.7
Nationality	German	18	81.8
	Dutch	1	13.6
	Other	3	4.5
Education	Highschool	3	13.6
	Bachelor	15	68.2
	Master	3	13.6

Table 2 contains relevant information on each participant's induvial means and standard deviations for the constructs of optimism, daily stressor, and personal growth. The table displays how each participant differs in their state measures of those constructs over the course of the study.

Table 2

Means and Standard Deviations of State Measure for each Participant

| Participant	Optimism		Daily Stressor		Personal Growth	
	Mean	Std.	Mean	Std.	Mean	Std.
1	4.55	0.80	4.22	1.12	9.10	1.54
2	4.11	0.96	4.41	1.50	6.81	1.54
3	3.27	1.51	3.87	1.65	6.75	1.98
4	5.21	1.40	4.57	1.56	9.33	1.82
5	4.71	0.92	4.38	1.13	10.31	1.06
6	4.70	1.11	4.62	1.78	9.30	1.43
7	5.42	0.96	5.30	1.49	10.84	1.83
8	3.64	1.69	4.73	1.87	8.26	2.07
9	4.95	1.44	4.62	1.72	9.37	2.84
10	3.61	1.31	4.40	1.34	8.26	2.54
11	4.60	1.30	4.47	1.35	9.80	1.64
12	4.25	1.07	5.16	1.43	8.95	1.60
13	5.08	.98	5.05	1.80	9.70	1.37
14	4.88	1.68	4.50	1.55	7.50	3.39
15	3.71	1.30	3.96	1.62	9.03	1.13
16	4.24	1.81	3.82	1.70	8.85	2.10
17	5.96	1.18	4.50	1.96	9.60	2.23
18	4.91	1.05	4.78	1.33	8.57	2.28
19	4.43	1.92	4.49	1.74	9.38	2.49
20	4.22	1.15	4.44	1.64	8.96	1.62
21	4.05	1.35	4.38	1.40	8.85	2.08
22	3.86	1.01	4.70	1.31	8.16	2.06

Variation of all Participants

The boxplots aim to visually represent the variability within participants state measures of daily stressor, personal growth, and optimism. It is visible that most participants

have a relatively high variability within their measures for daily stressor throughout the course of the study. Nonetheless, some participants did show less of a variation within their indicated levels of daily stressor, such as participant 1, 4, 15 and 19 (Figure 1). However, the whole sample indicated a medium level of daily stressor with a mean of 4.47 (*SD*=1.62).
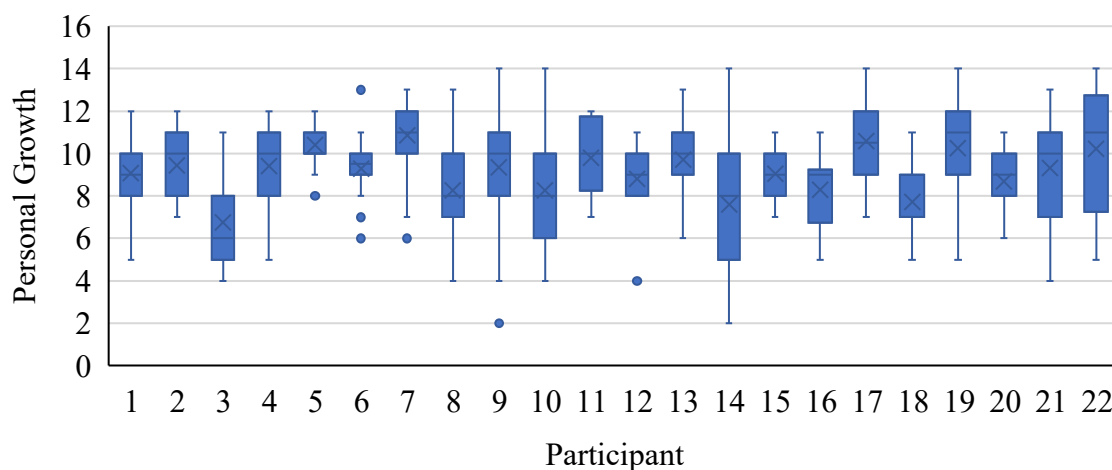
Figure 1

Boxplot displaying the Variation of all Participants' State Measures of Daily Stressor over Time
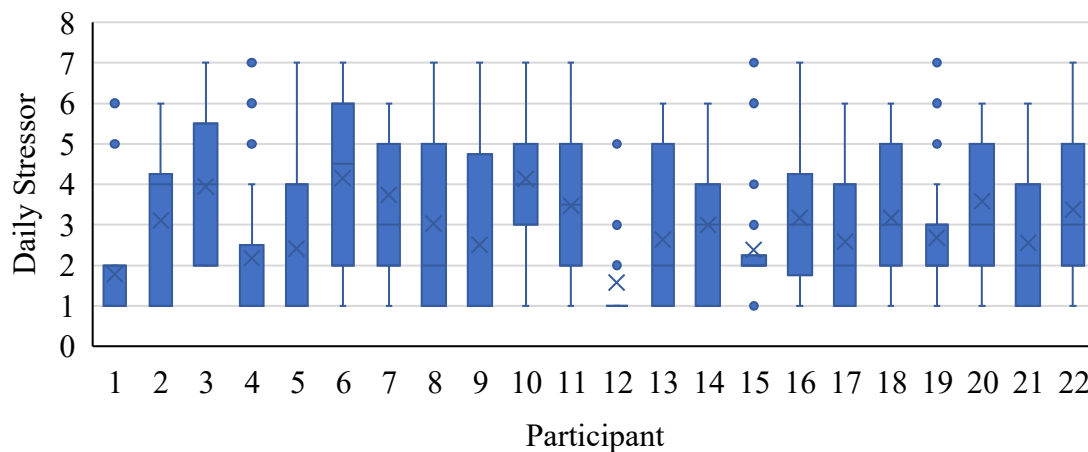
Within Figure 2 it becomes visible that the variability within and between participants is rather low on personal growth. Only three out of the 22 participants, participant 10, 14, and 22 show a higher variability within their indicated scores compared to the rest of the sample. Nonetheless, the whole sample reported a relatively high level of personal growth with a mean of 9.15 (*SD*=2.19).

Figure 2

Boxplot displaying the Variation of all Participants' State Measures of Personal Growth over Time

Looking at the indicated scores of optimism for the whole sample a higher variability between as well as within participants is observable (Figure 3). Participant 8 and 21 show a lot of variation in their perceived optimism measures. To illustrate further, participant 17 shows almost no variation with remarkably high sores. The whole sample exhibits a moderate level of optimism with a mean of 4.52 (*SD*=1.43).

Figure 3

Boxplot displaying the Variation of all Participants' State Measures of Optimism over Time
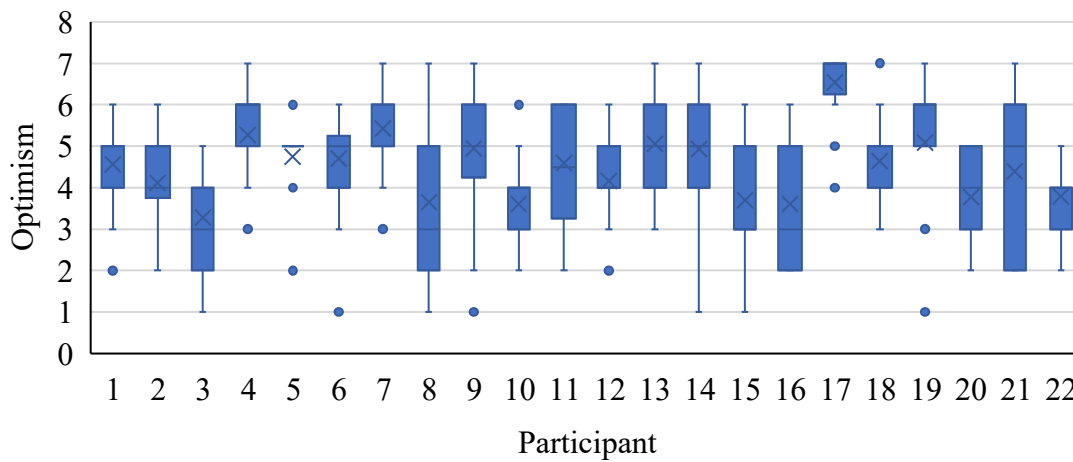
Relation between Daily Stressor and Personal Growth

The outcome of the LMM showed that daily stressor and personal growth are moderately positively but significantly related (*ß*=.50, *p*<.001). Hence, as the experience of a daily stressor increases, personal growth tends to increase as well. Thus, the hypothesis that daily stressors are positively associated with personal growth can be accepted. More relevant information on the relation between daily stressors and personal growth are displayed in Table 3.

Table 3

Estimates of Fixed Effects with Daily Stressor as Independent Variable and Personal Growth as Dependent Variable

							95% CI	
							Lower	Upper
Parameter	ß	b	SE	df	t	Sig	Bound	Bound

Intercept	.01	.01	.07	708	.04	.97	-.13	.13
Daily stressor	.50	.22	.04	708	11.94	<.001	.42	.59

df Degrees of freedom *CI* Confidence interval of unstandardized estimates

Figure 4 underlines the findings of the analysis and displays the relationship between daily stressor and personal growth within participant 1. The visual representation of participant scores over time is intended to show how these two constructs relate to each other within an individual.

Figure 4

Line Plot displaying Person Mean Centered Scores of Daily Stressor and Personal Growth within an Individual over Time
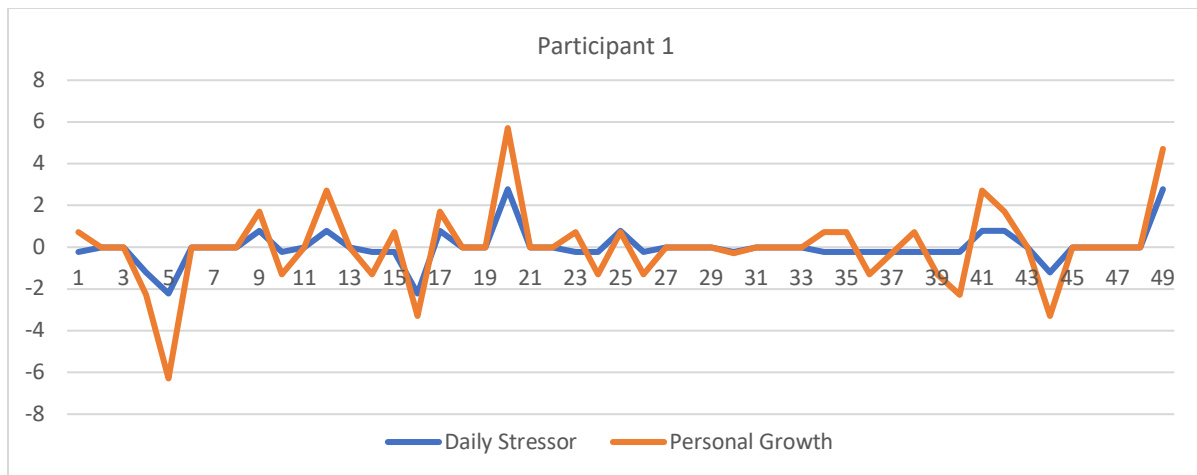
Moderation Effect of Optimism and Daily Stressor on Personal Growth

Table 4 provides information about the estimated effects of daily stressor, optimism, and their interaction on personal growth. The outcome of the moderation analysis shows that the construct of daily stressor is weakly positively significantly related to personal growth (β=.17, *p*<.001). Moreover, it appears that optimism is positively and significantly related to personal growth (β=.72 *p*<.001). When checking for moderation, there is a negative and statistically non-significant interaction effect of daily stressor and optimism on personal growth (β=-.04, *p*=.12). Since the interaction effect is not significant, this suggests that the relationship between daily stressor and personal growth does not differ significantly by levels

of optimism. Hence, the hypothesis that optimism positively moderates the relation between daily stressors and personal growth cannot be accepted.

Table 4

Estimates of Fixed Effects with Daily Stressor and Optimism as Independent Variable and Personal Growth as Dependent Variable Testing for Moderation

							95% CI	
							Lower	Upper
Parameter	*ß*	b	*SE*	*df*	*t*	Sig	Bound	Bound
Intercept	.05	.03	.07	705	.72	.47	-.08	.18
Daily Stressor	.17	.01	.45	705	3.68	<.001	.08	.26
Optimism	.72	.53	.06	705	12.00	<.001	.60	.84
Daily Stressor*Optimism	-.04	-.05	.03	705	-1.56	.12	-.10	.01

df Degrees of freedom *CI* Confidence interval of unstandardized estimates

Figure 5 illustrates the relationship between optimism and personal growth within participant 9 over time. It can be seen that with an increase in optimism, an increase in personal growth takes place. This exemplifies that the use of optimism results in personal growth.

Figure 5

Line Plot displaying Person Mean Centered Scores of Optimisms and Personal Growth within an Individual over Time
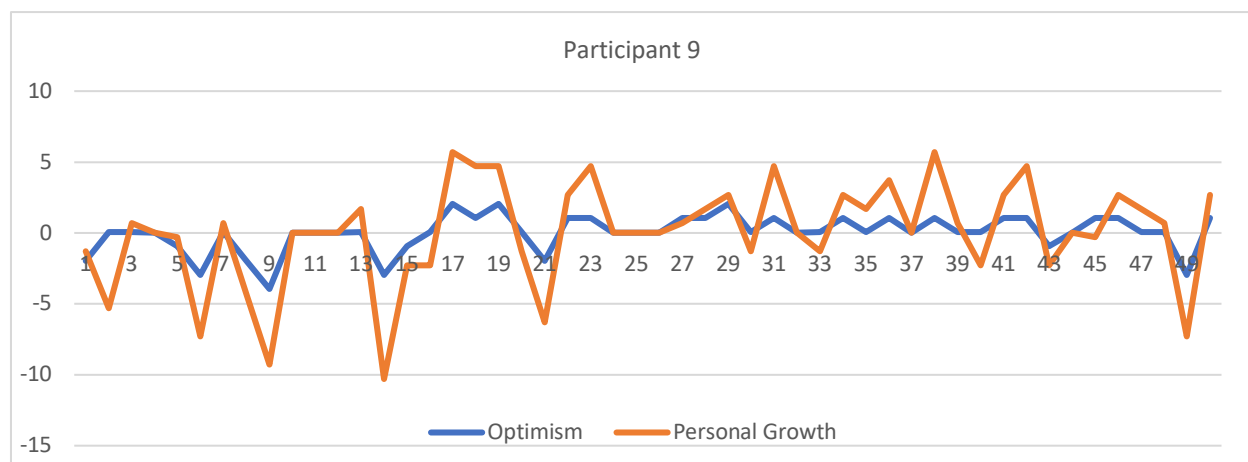
Figure 6 illustrates the relationship between high optimism, personal growth, and daily stressors within a single participant, while Figure 7 illustrates low scores on optimism, personal growth, and daily stressors within another participant. These figures serve as visual representations of the analysis findings, indicating that changes in optimism, whether increased or decreased, do not alter the association between personal growth and daily stressors.

Figure 6

Line Plot displaying Person Mean Centered Scores of High Optimism, Personal Growth and Daily Stressor within an Individual over Time
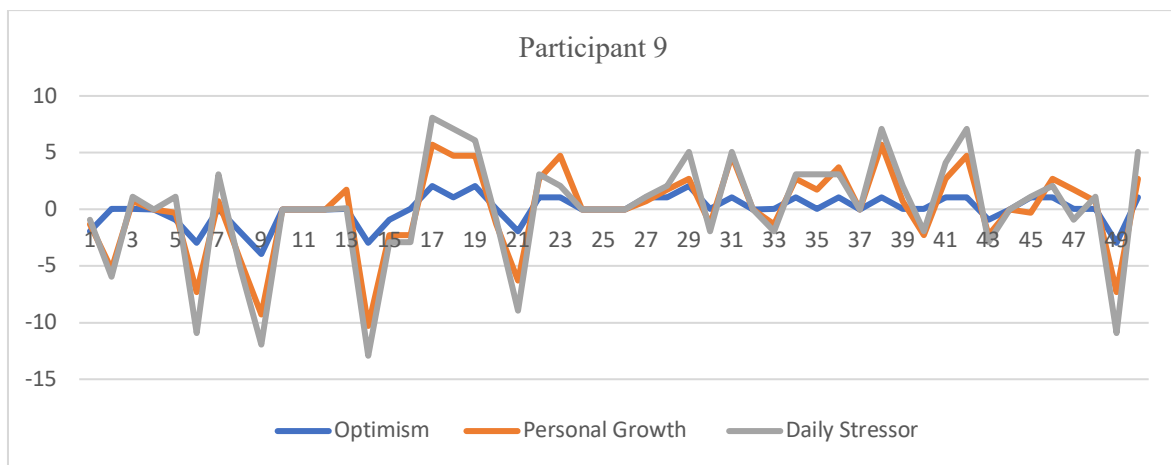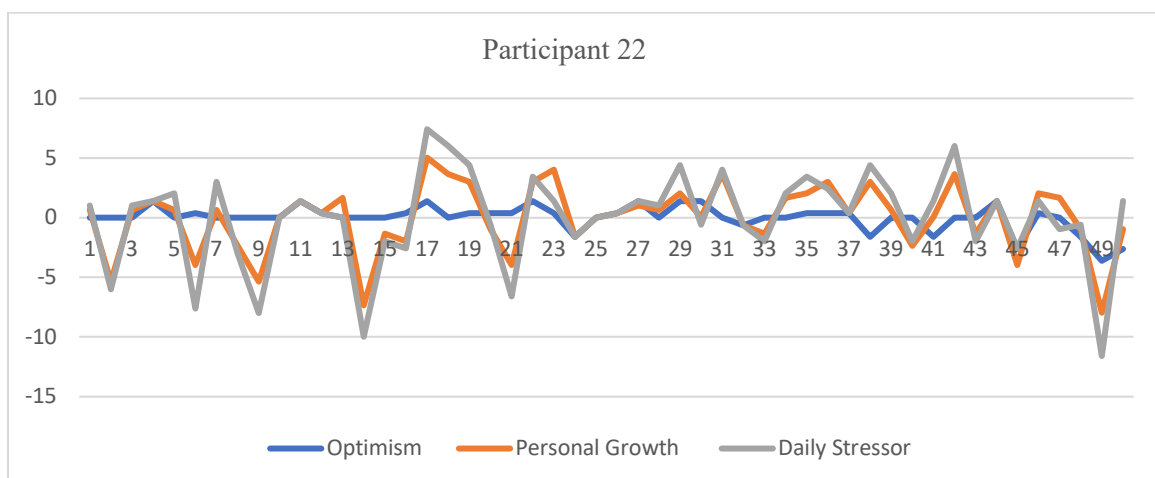

Figure 7

Line Plot displaying Person Mean Centered Scores of Low Optimism, Personal Growth and Daily Stressor within an Individual over Time

Discussion

The study aimed at further investigating the relation between personal growth, daily stressor and optimism in daily life. It was tested whether daily stressors are positively associated with personal growth. In addition, it was investigated whether optimism positively moderates the association between daily stressors and personal growth. The results indicate that daily stressors are moderately positively and significantly associated with personal growth, suggesting that an increase in daily stressors may lead to personal growth. Nonetheless, the results reveal that optimism does not positively moderate the association between daily stressors and personal growth, despite the findings that optimism is positively associated with daily stressors and personal growth individually.

Main Findings

The first finding that this research revealed is a statistically significant moderate positive relationship between daily stressors and personal growth. This finding indicates that the experience of daily stressors can potentially lead to personal growth within an individual. The results are in line with the expectations of the study, which supposed that the experience of daily stressors can potentially lead to personal growth, and no major life crisis or trauma is required for personal growth. While the negative consequences of daily stressors on mental health and negative emotions are well documented, the current study sheds light on the potential positive aspects of experiencing daily stressors, suggesting that personal growth can emerge from such experiences. Negative consequences of daily stressors, such as headache, back pain, negative implications on psychological well-being, and an increase in negative affect, have been documented in various studies (Charles & Almeida, 2006; Pinquart & Sörensen, 2003; Gabel et al., 2000). The current study adds on the positive perspective or aspects of experiencing daily stressors and is in line with previous research that argues that personal growth can emerge from being confronted by subjective stressors (Tedeschi & Calhoun, 2004).

Next, the findings of this research revealed a non-statistically significant moderation of optimism on personal growth and daily stressor. It reveals that the level of optimism within an individual does not lead to a change in personal growth when experiencing daily stressors. This finding is not in line with the paper's hypothesis. It was hypothesized that optimism positively moderates the association between personal growth and daily stressors. This was hypothesized as research found that optimism acts as a catalyst for personal growth (Park, 2004; Taubman–Ben-Ari et al., 2018). Notwithstanding, the current study adds on previous findings by finding a significant positive association between optimism and personal growth. Additionally, a study conducted by Lai (2009) explored the influence of dispositional optimism in mitigating the impact of daily hassles on the mental well-being of Chinese adolescents. The results revealed that optimism played a crucial role in buffering the perceived stress experienced by the participants. These findings added to hypothesizing a positive moderating effect of optimism on the relationship between personal growth and daily stressors.

Nonetheless, A study by Treharne et al. (2001) investigated optimism as a possible moderator for daily stress of minor events and subsequent symptoms of upper respiratory tract infections and found no significant moderation effect. The current study adds on these findings by also finding no significant moderation effect of optimism. One possible explanation for the absence of a moderation effect of optimism on the relation between personal growth and daily stressors in this study could be attributed to the use of state measures of optimism instead of dispositional optimism, which was mostly used in previous research. It is possible that participants in this study already exhibited high levels of dispositional optimism, which may have limited the potential for optimism to effectively moderate the relationship between personal growth and daily stressors.

Limitations & Strengths

The chosen study design demonstrates notable strengths, particularly in terms of ecological validity. Throughout the study, data was collected over a duration of 10 days per participant encompassing five measurement points each day. This approach allows for a more accurate reflection of participants' real-world experiences, providing researchers with valuable insights into their daily lives (Palmier-Claus et al., 2011). By capturing fluctuations and dynamics of participants' actual states through multiple daily measurements in a naturalistic setting, a more comprehensive understanding of the investigated constructs can be achieved (Palmier-Claus et al., 2011). Additionally, the real-time data collection employed in this study significantly reduces recall bias by eliminating participants' reliance on memory, thus minimizing the impact of false memories and facilitating the gathering of more accurate and detailed information about the constructs of interest (Colombo et al., 2020).

Besides the identified strengths, it is crucial to acknowledge the limitations as well. One such limitation lies in the potential participant burden associated with ESM studies. The frequent measurement points per day, with additional prompts sent to participants' mobile devices, can potentially disrupt their daily routines, such as work or study life (Verhagen et al., 2016). The demands of responding multiple times per day may contribute to participant burden and subsequently higher dropout rates. In fact, this effect was observed in this study, as the initial sample of 48 participants was reduced to 22 after removing those with a response rate below 30%. This number adds to the exclusion of 54% of participants. A study by Flueckiger et al. (2017) compared two intensive longitudinal studies which both excluded 10% of the participants. Hence, compared to previous ESM studies, the number of excluded participants within this study is very high.

Another limitation pertains to the chosen method of sampling, namely convenience sampling. This nonprobability sampling approach is often based on practical considerations, such as participant availability and willingness to participate (Etikan et al., 2016). However, convenience sampling introduces a potential sampling bias, leading to a sample that may not

be fully representative of the overall population and consequently leading to biased results. This limitation is intertwined with another concern, namely limited generalizability. The common use of convenience sampling, along with typically small sample sizes, presents challenges when attempting to generalize the study's findings to a broader population. The sample of this study consisted mainly of students around the same age. The stressors students experience on a daily basis differ when compared to those of a broader and older population. Students seem to mostly experience self-imposed stressors such as comparing themselves to others or wanting to be liked by others (Hamaideh, 2011), whereas older adults experience more health-related stressors (Yancura & Aldwin, 2008). Hence, results may differ when considering a broader population in terms of growth related to daily stressors.

In summary, the study design exhibits strengths related to ecological validity, enabling a closer alignment with participants' real-world experiences. Simultaneously, it is important to recognize the limitations, including participant burden associated with multiple measurements per day and potential dropout rates, as well as the potential sampling bias and limited generalizability resulting from convenience sampling.

Future Research

After focusing on strengths and limitations of this study, one recommendation for future research would be to consider such a study design with a larger sample. To enhance the generalizability of findings, future research could aim for a more representative sample. This could be achieved by using a different sampling approach. Approaches such as stratified random sampling (Iliyasu & Etikan, 2021) or aiming at recruiting participants not only from researchers' pool of friends and colleagues could ensure a more diverse and larger sample. Hence, the sample would be a better representation of the population and generalizing results would be easier and the whole study of more value. Additionally, a larger and more diverse sample would potentially yield different results due to different stressors experienced by the participants, due to a broader range of perceived daily stressors.

Moreover, the current study did not take any contextual factors into account. Researchers were only interested in the constructs themselves, and not in any contextual factors that may influence those. Contextual factors, such as income or social relationships, can potentially influence an individual's experiences, attitudes, and well-being (Diener & Seligman, 2004) and thus seem to be an important area to consider within future research. ESM studies can investigate factors such as time of the day or situational but also social factors influencing an individual's moods, feelings, or behaviours. Moreover, especially in the light of investigating optimism, as this study did, it can be valuable to consider factors such as socio-economic status (SES), within future research. Studies have revealed that higher SES and optimism are positively associated (Diener et al., 2003). Individuals who have a greater family SES, such as good educational opportunities and high income potentially display greater optimism within their attitudes but also better expectations about their future (Heinonen et al., 2006). With this knowledge, it would be interesting to investigate this within future research within an ESM study design. Such a study could be valuable to see how optimism may differ regarding individual's SES, within their daily lives and not only within their general attitude and outlook on life.

Implications

The results of this study have shown that optimism does not moderate the relation between daily stressors and personal growth. Nonetheless, it was found that optimism is positively associated with both constructs individually. Considering those findings, it would be of value to consider possible positive interventions focusing on increasing an optimistic outlook on life. Personal growth is associated with numerous positive outcomes for individuals, including improved mental health and subjective well-being (Robitschek & Keyes, 2009; Hasan et al., 2015). Research has already demonstrated the efficacy of positive interventions such as the 'Best Possible Self' intervention in increasing optimism (Malouff & Schutte, 2017). Those findings as well as the findings of the current study highlight the

importance of implementing such interventions for promoting personal growth and enhancing well-being within individuals.

Within society, stressors are often perceived as negative experiences. However, the current study has revealed that personal growth can potentially result from the experience of daily stressors. This finding is particularly valuable as it challenges the conventional view of stressors. Daily stressors are part of everyone's life, occurring frequently and affecting individuals on a regular basis. Reframing these stressors into something potentially positive and beneficial for personal growth could be of great value. The concept of positive reframing involves transforming something previously viewed as negative into a positive perspective (Lambert et al., 2009). Research has already shown that reframing experiences in a positive light can increase life satisfaction (Pakenham & Cox, 2008) and foster more positive expectations about future life satisfaction (Curbow et al., 1993). These findings highlight the transformative power of positive reframing. Considering the implications of this study, there is the opportunity to shift individuals' mindsets towards stressors and view them as potential catalysts for personal growth. By focusing on positive reframing, individuals are not only able to increase their satisfaction with life but also develop a more optimistic outlook on the future. This insight brings the opportunity of highlighting the power of positive reframing in our daily lives and fosters the potential for personal growth and well-being.

Conclusion

This study aimed to examine the relationship between optimism, personal growth, and daily stressors. The findings revealed a moderate positive and statistically significant association between daily stressors and personal growth, indicating that experiencing daily stressors can potentially contribute to personal growth. Additionally, the study explored the moderating role of optimism in this association and found no significant positive moderation effect. Future studies should consider employing larger and more diverse samples to enhance the generalizability and understanding of these relationships. Investigating additional

contextual factors, such as socio-economic status would also be beneficial to gain a more comprehensive understanding of the interplay between optimism, daily stressors, and personal growth. Lastly, this study contributes to the existing literature by shedding light on the concept of personal growth within the context of daily life experiences. This highlights the potential for future research in the field of ESM, particularly in exploring the construct of personal growth, which has been relatively underrepresented in previous research.

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Appendix

Appendix A

Informed Consent

This study focuses on responses to daily stressors and consists of two parts. In the first part, you have to fill out some general questionnaires. You only need to do this once and it takes about 20 minutes. The second part of the study lasts for 10 days. Per day, you will get 5 notifications to complete a short questionnaire. Completing this short questionnaire will take about 5 minutes.

Your participation in this study is completely voluntary and all your responses are treated anonymously. None of the responses will be connected to identifying information and wouldn't be shared with third parties. Data will only be used for statistical analyses. However, you can withdraw from the study at any time! By simply stopping answering the daily questions without the need to give any reasons.

If you would like to have further information about the research, now or in the future, feel free to contact *Mirjam Radstaak* at:

m.radstaak@utwente.nl.

If you have any complaints about this research, please direct them to Ethics Committee of the Faculty of Behavioral Sciences at the University of Twente, email: **ethicscommittee-bms@utwente.nl**.

Appendix B

Baseline Questionnaire

1 What's your gender?
    O Female
    O Male
    O Non-binary/Third gender
    O Prefer not to say
3 What's your age?
4 What's your nationality?
    O Dutch
    O German
    O Other
5 What is the highest degree or level of school you have completed? If currently enrolled, mark the
highest degree already received.
    O High school graduate
    O Bachelor's degree
    O Master's degree
    O Doctorate degree or higher
    O Other
6 What is your Sona ID? Fill in your personal number.

Appendix C

Item Daily Stressor

Think of the most striking event or activity in the last hour. How stressful was this event or activity?

Appendix D

Item Optimism

In the last hour, I felt optimistic

Appendix E

Items Personal Growth

In the last hour, I felt capable of handling difficulties

In the last hour, I felt that life is a continuous process of learning, changing and growth