Stress-Related Growth after Daily Stressors: The Role of Coping Strategies and Perceived Controllability of Stressors

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Abstract

This study investigated the role of coping strategies and perceived controllability of events for stress-related growth (SRG) in the context of daily events. We conducted a longitudinal study with 68 undergraduate students, who completed daily questionnaires for 7 consecutive days. Linear mixed regression analyses revealed that the implementation of problem-focused, emotion-focused and meaning-making coping strategies as a response to daily stressors predict SRG. However, the interaction between the perceived controllability of events and coping strategies did not significantly affect SRG. The match between the specific coping strategy used and the appraisal of the controllability of the event was not crucial for SRG after the daily events. These findings contribute to growth literature, suggesting that the implementation of coping strategies facilitates SRG after daily events, regardless of the perceived controllability of events.

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Controllability of Stressors

Traumatic life events can cause severe distress and seriously impede psychological and physical functioning (Yufik & Simms, 2010; Pacella et al., 2013). However, research has shown that traumatic events such as natural disasters, sexual assault, chronic illness and bereavement may also provide opportunities for growth and result in positive outcomes. The struggle of coping and enduring traumatic events can facilitate growth and result in an increase in personal resources, improved relationships, and more appreciation of life (Linley & Joseph, 2004; Park et al., 2004; Tedeschi & Calhoun, 2004; Zoellner & Maercker, 2006). Positive changes after traumatic events are referred to as post-traumatic growth. A broader term for growth after adversities other than traumatic events is stress-related growth (SRG; Park et al., 1996; Tedeschi & Calhoun, 1996). Research has primarily focused on posttraumatic growth and less is known about SRG after less severe events like daily stressors (Linley & Joseph, 2004). Therefore, this paper will explore SRG after daily stressors.

Growth after Daily Events

To minimise the potential repercussions of daily stressors, it is helpful to understand how individuals can deal with daily stressors to facilitate SRG. Daily stressors such as time-management-, interpersonal-, or job-related issues are commonly experienced and the failure to manage those can develop into chronic stress and eventually lead to serious health consequences (Tennant, 2002; Vedhara & Irwin, 2005). However, some evidence suggests that daily stressors can provide growth opportunities as well (O´Neil et al., 2004; Losavio et al., 2011). It is important to note, that the mechanisms involved in SRG after daily events might

differ from post-traumatic growth. For example, while rumination is considered a maladaptive strategy for processing trauma, short-term rumination as a response to daily stressors has been shown to promote growth (LoSavio et al., 2011).

Factors Related to Stress-Related Growth

Empirical research identified various factors that predict SRG. These include (a) personal characteristics like optimism, (b) cognitive factors like meaning-making efforts, (c) external resources like social support, (d) demographic factors like educational level and (e) event characteristics like high severity of events (Park et al., 1996; Tedeschi & Calhoun, 1996; Linely & Joseph, 2004). Some studies also investigated how the interaction between different factors affects SRG. For example, optimism partially moderated the relationship between social support and SRG in a cross-sectional study. This study suggested that social support facilitates more positive attitudes toward life and increases optimism, subsequently promoting SRG (Ting Li, 2021). In another cross-sectional study, coping strategies moderated the relationship between threat appraisal and SRG. SRG was highest for individuals who experienced an event as highly stressful and utilised adaptive coping strategies like cognitive reattribution to deal with the event (Armeli, 2001). It seems that the interaction between different factors is crucial for SRG. Further investigation of relationships between different factors could help us to gain a better insight into how SRG emerges.

Coping Strategies

The way people cope with adverse events is essential in SRG. Folkman and Lazarus (1985) define coping as cognitive and behavioural efforts to manage and reduce stress. For instance, cognitive efforts to reduce stress involve seeking new perspectives about the situation and behavioral efforts involve seeking social support. Depending on the availability of coping

strategies and personal preferences, people implement coping strategies to manage stressful situations (Folkman & Lazarus, 1985). We distinguish between adaptive and maladaptive strategies. Adaptive strategies are positively related to mental health and successful adaptation to stressors. For example, acceptance and positive reappraisal are considered adaptive coping strategies. On the other hand, maladaptive strategies are associated with poor mental health and include strategies like catastrophising (Ochsner & Gross, 2008; Gresham & Gullone, 2012; Radstaak et al., 2011). The three main categories of coping strategies are; (a) *problem-focused coping*, (b) *emotion-focused coping* and (c) *meaning-making* (Folkman & Lazarus, 1985; Pearlin, 1991).

Problem-Focused Coping Strategies

Problem-focused coping refers to actively confronting the stressor by seeking solutions and taking steps to alter the stressor. For instance, seeking advice to deal with and minimise the stressor, creating a plan by identifying the steps needed to solve the stressor, and taking action to address the stressor (Folkman & Lazarus, 1985). In a cross-sectional study, cancer survivors who used problem-focused coping strategies to cope with their illness experienced SRG (Cordova, 2001). Confronting a stressor with problem-solving might increase one's sense of self-efficacy and strengthen one's confidence in overcoming stressful life events (Bandura, 1997; Stanton, 2002).

Emotion-Focused Coping Strategies

Emotion-focused coping refers to active attempts to regulate emotional distress caused by the stressor. Emotional suppression is an emotion-focused strategy considered maladaptive and inhibits SRG (Calhoun, 2000; Larsen & Berenbaum, 2015). On the other hand, adaptive emotion-focused coping strategies include engaging in relaxation techniques, accepting the

situation, and seeking emotional support from friends (Folkman & Lazarus, 1985). A cross-sectional study among breast cancer patients showed that seeking emotional support and engaging in relaxation techniques is predicted SRG (Karanci, 2007). Moreover, a meta-analysis revealed that efforts to regulate emotional distress after adversities by seeking emotional support and accepting the situation promote SRG. Regulating intense emotions after traumatic experiences might decrease their negative impact on psychological functioning (Prati & Pietrantoni, L, 2009).

Meaning-Making Coping Strategies

M*eaning-making* refers to making sense of an event and attempting to attribute a meaning to the event that transcends its immediate impact. An example of meaning-making is positive reappraisal (*i.e.*: positively re-interpreting a negative event; Pearlin, 1991). Meaning-making consistently predicts SRG (Vis & Boynton, 2008; Cardenas et al., 2019; Zeligman et al., 2019). The meaning-making model by Tedeschi and Calhoun (1995) proposes that individuals find meaning in traumatic events by restoring a sense of coherence after an event that disrupts one's core belief by integrating the situation into one's core belief system. They theorised that successfully integrating negative events in one's core belief system through meaning-making results in SRG.

Even though the mentioned coping strategies are generally regarded as adaptive and were shown to promote SRG, two things have to be taken into account: Firstly, the studies that found positive relationships between the mentioned strategies and SRG were mainly based on posttraumatic growth. The adaptiveness of coping strategies might differ for SRG after daily events. Secondly, the coping strategy's appropriateness for the specific stressor situation is crucial for its effectiveness (Vitaliano et al., 1990; Campos et al., 2011; Troy et al., 2013).

Besides the general adaptiveness of a coping strategy, the degree to which it is an appropriate response to a particular situation is crucial for its effectiveness. Some strategies might promote growth more strongly than others in specific contexts. Therefore, there is reason to suspect that event characteristics interact with coping strategies in predicting SRG.

Controllability of Events

The *controllability* of an event, meaning the degree to which the event itself or its outcome can be altered by personal action, could be a potential event characteristic that plays a role in the relationship between coping strategies and SRG. According to the goodness of fit hypothesis for coping, the effectiveness of coping efforts depends on the match between the coping strategy used and the context of the stressor. According to this hypothesis, emotion-focused coping is more functional for psychological adjustment to stressors for uncontrollable events than problem-based. In contrast, problem-based coping is assumed to be more functional for controllable events than emotion-based coping (Vitaliano et al., 1990).

A cross-sectional study investigating SRG after major life events such as illness or death of a family member found support for this hypothesis. A good fit between controllability and coping strategy (*e.g.* problem-focused coping for controllable events) was associated with lower symptomatology, whereas a poor fit (*e.g.* problem-focused coping for uncontrollable events) was associated with higher symptomatology (Forsythe & Compas, 1987). Other studies found only partial support for the hypothesis. For instance, one study discovered a significant interaction between problem-focused coping and controllability, indicating that coping efficacy was higher when problem-focused strategies were employed were stressors that were appraised as controllable. However, this study did not find a significant interaction between emotion-focused coping and controllability (Conway & Terry, 1992). Another study found

significant interactions between controllability and coping strategies, whereas no interaction between meaning-making and controllability was found. This study suggested that meaning-making is an effective coping strategy in various situations (Saakvitne et al., 1998; Park et al., 2001). Another cross-sectional study investigated the interaction between the controllability of events and coping strategies and its impact on SRG. This study asked for the most stressful event that respondents experienced and the highest portion of reported stressors were achievement-related stressors and interpersonal stressors. The authors found that emotion-focused coping leads to higher levels of SRG if the event is uncontrollable (Göral 2006). However, no interaction between problem-focused coping and controllability was found.

The mentioned studies suggest that problem-focused coping predicts SRG more strongly in controllable situations and emotion-focused coping predicts SRG more strongly in uncontrollable situations. However, meaning-making coping does not seem to be affected by the perceived controllability of events and seems to be a consistent predictor of SRG. Again, these insights are all based on studies on SRG in the context of major life events.

Aim of the Present Study

This study aims to investigate the role of coping strategies (problem-focused-, emotion-focused-, and meaning-making coping) and their interaction with the perceived controllability of events for SRG after daily events. Such knowledge could inform well-being interventions about appropriate ways to respond to commonly experienced daily stressors to protect oneself against the detrimental consequences of chronic stress and promote SRG instead. The research question is formulated as: *What is the relationship between coping strategies, the perceived controllability of events and stress-related growth after daily stressors?* Based on existing growth literature, the following Hypotheses were formed:

H1.1: Problem-focused coping strategies predict SRG in response to daily stressors.

H1.2: Emotion-focused coping strategies predict SRG in response to daily stressors.

H1.3: Meaning-making coping strategies predict SRG in response to daily stressors.

H2.1: The perceived controllability of stressors moderates the relationship between emotion-focused coping and SRG. Specifically, the relationship between emotion-focused coping and SRG is enhanced if the stressor is perceived as uncontrollable.

H2.1: The perceived controllability of stressors moderates the relationship between problem-focused coping and SRG. Specifically, the relationship between problem-focused coping and SRG is enhanced if the stressor is perceived as a controllable event.

H.2.3: Meaning-making does not interact with controllability in relation to SRG.

Methods

Design

A longitudinal between-subject design was chosen for this study. As part of a larger study, we followed a diary method with 2 measurements per day for 7 consecutive days; one questionnaire in the morning assessing sleep quality and one questionnaire about the most stressful event of the day, assessing coping strategies, perceived controllability of the stressor, core belief disruption, and SRG in the evening. The questionnaires were sent to the respondents via a smartphone application. To test the Hypotheses of the current study, we only included relevant variables: The independent variables were emotion-focused coping, problem-focused coping, meaning-making coping and the perceived controllability of events and the dependent variable was SRG.

Participants

The sampling method was a combination of convenience and snowball sampling. Respondents could sign up voluntarily through the SONA System of the University of Twente, which grants credits for participating in studies that need to be collected by undergraduate students. Moreover, a link for the participation of this study was sent to colleagues via social media channels like Whatsapp. Inclusion criteria were speaking English, being a student and owning a smartphone.

Sixty-eight respondents consented to participate in this study and were instructed to fill in one questionnaire per day for 7 days. However, day 6 was excluded from the dataset, because the questions were not displayed properly and participants could not fill in the questionnaire, due to technical issues with the application used to collect data. All respondents filled in at least one questionnaire from the remaining 6 days. Only complete questionnaires were registered, meaning that there were no questionnaires that were only partly filled in. The response rate seemed to be systematically decreasing with the measurement day. For instance, the response rate was 100% on day 1 and 94.5% on day 2 whereas the response rates on days 5 and 7 were below 45%. The total response rate was 72.8%, resulting in 297 completed questionnaires. By employing complete case analysis, all completed questionnaires from any day were included.

Of the 68 respondents, 60% were female and 40% male. The age ranged from 18 to 27 ($M = 22.5$; $SD = 1.7$). The majority of the respondent's nationality was German (65%) and Dutch (22%). The remaining 13% were either American, Russian or from the Ukraine.

Materials

Twente Intervention and Interaction Machine

The data collection was conducted through the Twente Intervention and Interaction Machine (TIIM) application, which enabled us to administer the daily questionnaires (The BMS

Lab, 2023). The TIIM is a survey software developed by the Behavioural, Management and Social Science Department of the University of Twente and was designed to administer questionnaires or interventions to participants at predefined moments. It is used by students and researchers from the University of Twente to collect data. TIIM can be downloaded on a smartphone and enabled us to administer daily questionnaires at specific times of the day. Moreover, push notifications were sent to notify the respondents about the questionnaires.

Daily Stressful Event

Respondents were asked to identify their most stressful event of the day[1] to ensure that their following answers would be based on that one event. A checklist of common daily stressors among college students was provided (*e.g.* academic pressure, social stressors, financial concerns; Appendix A). The list was derived from a diary study about daily stressors among college students which was also used by another study regarding SRG (Dash, 2008; Losavio, 2011). If the events from the checklist were not applicable, respondents were asked to name their stressor in an open box.

Perceived Controllability

The perceived controllability of the events refers to the degree to which people believe they have personal influence over the event and can control the event itself or the outcome of the event. Respondents were asked to rate how much personal control they felt over their stressor with an item constructed by the researcher. The perceived controllability was measured with the item "How controllable did you perceive this event to be?" and the answer categories ranged from 0 (not at all controllable) to 5 (completely controllable). The median of controllability ($Mdn = 4$) was used as a cut-off point to categorize values below 4 as uncontrollable events and values equal to or above 4 as controllable events.

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[1] In the following "the stressor" will be used as a synonym for "the most stressful event of the day"

Coping Strategies

To measure which coping strategies respondents implemented to deal with their stressor, the short Cognitive Emotion Regulation Questionnaire (CERQ-short) was used (Garnefski & Kraaij, 2006). The CERQ-short is an 18-item scale with nine subscales that measure coping strategies in response to stressors. The answer categories ranged from 0 (I didn´t do this at all) to 5 (I did this a lot). The CERQ-short is widely used for empirical research (Geisler, 2010; Gubler & Makowski, 2021; Meule, 2021).

For the purpose of this study, three subscales were chosen: *refocus on planning, acceptance* and *positive reappraisal* (Appendix B). Each subscale consists of two items. The subscales demonstrated acceptable reliability with Cronbach Alpha values above 0.7 and acceptable criterion validity (Garnefski & Kraaij, 2006). We adapted the items and answer categories by rewriting them to past tense. Using past tense ensured respondents answered based on how they dealt with their particular stressor that day.

The subscale *refocus on planning* was chosen to measure problem-focused coping (*e.g.* I thought about a plan of what I can do best in this situation.). Refocus on planning refers to efforts to develop a plan of action to deal with stressors. Planning had an inter-item correlation of .5 indicating a moderate positive correlation in this study. The subscale *acceptance* was chosen to measure emotion-focused coping (*e.g.* I thought I had to accept the situation). Acceptance refers to acknowledging one´s emotions and the situation without attempting to control or change the situation. The acceptance scale had an inter-item correlation of .85 indicating a strong positive correlation in this study. Lastly, the subscale *positive reappraisal* was chosen to measure meaning-making (*e.g.* I thought that I can learn something from the situation). Positive reappraisal refers to efforts to attribute a positive meaning to events. The

inter-item correlation of the reappraisal scale had a correlation coefficient of .65 indicating a moderate positive correlation in this study.

Stress-Related Growth

To measure SRG, the Stress-Related Growth Scale-Short Form (SRGS-SF, Appendix C) was used (Cohen et al., 1998). The SRGS-SF consists of 15 items with answer categories ranging from 0 (not at all) to 2 (a great deal). Examples include "I learned to be a more confident person" and "I learned to stand up for my personal rights". The reliability and validity of the scale have been demonstrated in various populations (Cohen, 1998; Wang et al., 2018; Oliveira, 2021). The scale has good internal reliability with Cronbach´s Alpha values above .8 (Park & Blumberg, 2002; Park, 2005; Bjorck, 2014). The scale has good internal reliability with Cronbach´s Alpha values above .8 (Park & Blumberg, 2002; Park, 2005; Bjorck, 2014). The internal consistency of the SRG scale in this study was high with a Cronbach's alpha value of .91.

Procedure

 Before collecting the data, ethical approval by the Ethical Committee of the University of Twente was obtained. All respondents were asked to read and sign an informed consent form (Appendix D). Potential respondents were provided with a brief summary of the aim and scope of the study and could voluntarily sign up for the study with their e-mail addresses (Appendix E). If they signed up, they received an e-mail with further instructions: namely to download the TIIM application on their phones and sign up for the study by indicating the study code.

By signing up on the TIIM application, they gained access to the study. The study's first page displayed the informed consent form that needed to be signed to continue with the study. Questions about demographics followed the informed consent. At 6 pm the following day, the

first notification was sent through the TIIM application that asked respondents to complete the daily questionnaire. A reminder notification was sent at 8 pm if the questionnaire still needed to be completed. The questionnaire could be completed by 11 pm. The daily questionnaire took approximately 15 minutes to complete.

The questionnaire included all daily measures. The questionnaire started with the assessment of the most stressful event of the day, followed by the perceived controllability of the event. Then the implemented coping strategies were assessed and lastly, the SRGS-SF was conducted. The daily questionnaire was repeated for the seven days of the data collection. After completing the questionnaire on day 7, respondents were thanked for participating.

Data Analysis

For the statistical analysis, the latest version of the statistical software R Studio (2023.06.0+421) was used. The required packages for the analysis were tidyverse, dplyer, ggplot2 and lmtertest. First, we computed means, standard deviations and a correlation matrix to gain an overview of the dataset. Then we checked the assumptions of normality, linearity, homoscedasticity, and no multicollinearity. To account for repeated measures, we used linear mixed models with the respondent as random effects for all analyses.

For the main effects of coping strategies on SRG, we conducted three linear mixed models. Each model included one coping strategy (planning, acceptance and positive reappraisal) as a predictor and SRG as the outcome variable. To test the moderating role of perceived controllability we performed three moderation analyses. Each analysis included one of the three coping strategies, perceived controllability and interaction as predictors and SRG as the outcome variable.

Results

Descriptive Statistics

Tables 1 and 2 provide the means and standard deviations of all variables per day.

Table 1

Means and Standard Deviations Day 1-3

Variable	Day 1		Day 2		Day 3	
	M	SD	M	SD	M	SD
Planning	3.37	.9	3.07	1.08	2.96	1.02
Acceptance	3.48	1.04	3.23	1.42	3.11	1.29
Positive Reappraisal	2.72	1.23	2.41	1.33	2.37	1.13
Controllability	3.66	.98	3.42	1.27	3.25	1.36
SRG	11.4	7.08	9.49	6.94	9.23	6.44

Table 2

Means and Standard Deviations Day 4,5,7

Variable	Day 4		Day 5		Day 7	
	M	SD	M	SD	M	SD
Planning	2.9	1.21	2.9	1.17	2.9	1.08
Acceptance	3.48	1.36	3.23	1.17	3.11	1.26

Positive Reappraisal	2.27	1.06	2.32	1.13	2.4	1.16
Controllability	2.92	1.29	2.87	1.27	2.83	1.34
SRG	8.8	6.73	9.71	7.38	10.4	7.76

Table 3 presents the correlation matrix between the variables. The coping strategies correlated positively with each other. The strongest correlation was between positive reappraisal and SRG, suggesting a relatively strong relationship between these two variables. The lowest correlation was between controllability and SRG, suggesting a weak correlation.

Table 3

Correlation Matrix

Variable	1	2	3	4	5
1. Planning	–	–	–	–	–
2. Acceptance	.3*	–	–	–	–
3. Positive Reappraisal	.32*	.4*	–	–	–
4. Controllability	.18*	.12*	.2*	–	–
5. SRG	.2*	.25*	.53*	.07*	–

Note. * *p < .05 level.*

Linear-Mixed Regression Models

The linear assumptions of linearity, homoscedasticity, normality and no multicollinearity were satisfied by the model. We conducted three separate linear mixed models, each using one of the three coping strategies as the predictor for the outcome variable SRG. The results indicate that planning had a significant positive effect on SRG, $\beta = 1.08$, $SE = .28$, $t(267.7, 3.78)$, $p = < .001$. Similarly, acceptance predicted SRG, $\beta = .72$, $SE = .25$, $t(271.5, 2.89)$, $p = < .05$. Lastly, positive reappraisal demonstrated a significant positive effect on SRG, $\beta = 2.06$, $SE = .24$, $t(277.1, 8.62)$, $p = < .001$. These findings provide evidence for the first three hypotheses, suggesting that the three coping strategies promote SRG.

Moderation Analysis

To test the moderating role of perceived controllability of events, we performed three linear mixed moderation models including one of the three coping strategies and their interaction term with perceived controllability as predictors of SRG. The results are shown in Tables 4, 5 and 6. In all three models, perceived controllability, as well as the interaction between perceived controllability with each of the coping strategies, was non-significant. Therefore, we found no evidence for Hypothesis 2.1 and 2.2 regarding the interaction between the perceived controllability of events and the coping strategies planning and acceptance. In line with Hypothesis 2.3, we found no evidence for the interaction between the perceived controllability of events and positive reappraisal. Moreover, the main effect of planning was non-significant on the outcome variable SRG. Similarly, the main effect of acceptance was non-significant on SRG as well.

Table 4

Moderation Analysis: Planning and Controllability

Effect	Estimate	SE	95% CI		p
			LL	UL	
Intercept	22.4	2.03	18.41	26.39	>.01
Planning	.59	.63	-.63	1.83	.34
Controllability	-.03	.59	-1.19	1.13	.95
Planning x Controllability	.12	.18	-.24	.47	.51

*Note: 5% significance level

Table 5

Moderation Analysis: Acceptance and Controllability

Effect	Estimate	SE	95% CI		p
			LL	UL	
Intercept	21.4	2.1	17.27	25.52	>.01
Acceptance	.71	.59	.46	1.89	.23
Controllability	.53	.56	-.59	1.65	.34
Acceptance x Controllability	-.01	.17	-.9	.88	.94

*Note: 5% significance level

Table 6

Moderation Analysis: Reappraisal and Controllability

Effect	Estimate	SE	95% CI		p
			LL	UL	
Intercept	19.57	1.6	16.42	22.27	>.01
Reappraisal	2.1	.65	.83	3.37	>.01
Controllability	.18	.44	-.67	1.03	.68
Reappraisal x Controllability	-.02	.18	-.38	.33	.89

*Note: 5% significance level

Discussion

The aim of this study was to examine the relationship between coping strategies, perceived controllability of events, and SRG after daily stressors. It was hypothesized that problem-focused coping, emotion-focused coping, and meaning-making in response to daily stressors predict SRG. Moreover, we expected the perceived controllability of events to moderate the relationship between the coping strategies and SRG. It was hypothesized that the relationship between planning and SRG is enhanced if the stressor is perceived as controllable and that the relationship between acceptance and SRG is enhanced if the stressor is perceived as

uncontrollable. Lastly, we expected the relationship between meaning-making and SRG not to be affected by the perceived controllability of events.

Summary and Implications of the Findings

We found support for Hypotheses 1.1, 1.2 and 1.3 stating that problem-based coping strategies, emotion-based coping strategies, and meaning-making positively predict SRG after daily stressors. The use of each of the coping strategies significantly and positively predicted SRG. These findings align with previous studies suggesting that the utilization of coping strategies such as problem-focused coping, emotion-focused coping and meaning-making contribute to SRG (Park & Cajon, 1996; Tedeschi & Calhoun, 1996; Karanci, 2007; Göral, 2006; Dolbier, 2010).

Moreover, it is worth noting that all coping strategies correlated positively with each other. Therefore, there is reason to suspect that people use one or more coping strategies simultaneously rather than rigidly and distinctly choosing one strategy. In line with this, Folkman and Lazarus (1980) conducted an observational study, asking respondents how they dealt with certain events and found that most of the time people employ emotion-focused and problem-focused coping strategies at the same time.

Meaning-making had the highest correlation with SRG. It has to be noted that meaning-making and SRG may be overlapping constructs: Seeking an understanding of how a stressful experience could have had potentially positive effects (SRG) might be a kind of coping strategy itself (meaning-making). This overlap may be enhanced by the fact that respondents reported on their SRG on the same day of the event because they were potentially still in the process of coping with the event and reported growth as a function to process the event. In line with this, a longitudinal study suggests that perceived and actual growth are not necessarily

related (Yanez, 2011). Another study pointed out that SRG was not associated with more adaptive coping intentions in the future (Bjorck & Bryon, 2014). Reporting SRG might be a form of coping in itself in order to limit the negative impact of the event and might not represent actual but rather perceived or even illusionary growth.

The moderation analyses examining the effect of the interaction between coping strategies and perceived controllability of events on SRG did not reveal any significant effects. Therefore, Hypotheses 2.1 and 2.2 were not supported. Contrary to our hypotheses, the perceived controllability of events did not interact with problem-focused and emotion-focused coping. However, hypothesis 2.3 suggesting that the perceived controllability of events does not affect the relationship between meaning-making and SRG was supported. In line with our results, a study found that in the context of illness, a sense of control over one's health did not promote growth nor did it interact with more coping (Siegel, 2005)

Contrary to our findings a study found a significant effect of the interaction between emotion-focused coping and controllability on SRG. However, in line with our results, this study found no significant interaction between problem-focused and controllability (Göral, 2006). It has to be noted, that this study categorized the controllability of events based on objective measures, whereas the current study measured the perceived controllability, which could be the reason for the discrepancy. Also contrary to our findings, a study found a significant effect of the interactions between controllability and coping strategies in predicting symptomatology for major events. However, the effect was not found for daily events. The authors concluded from their results, that for daily events the mismatch between controllability and coping strategy is not as adverse as for the mismatch of major life events (Fotsythe, 1987).

There was a lack of correlation between the perceived controllability of events and SRG and there was no main effect of the perceived controllability of events on SRG. These findings suggest that the perceived controllability of events does not play an important role in SRG after daily stressors. It seems that the perceived controllability of events does not interact with coping strategies in the context of daily events as it does in major life events.

As stated earlier, reporting SRG and feeling a sense of growth might be a coping strategy in itself. This could explain the finding that SRG was not affected by the fit between controllability and coping strategies. Perhaps an appropriate fit between coping strategy and perceived controllability of events is more crucial for actual long-term growth, rather than the perceived immediate growth that was measured in this study. Even though, the match between the controllability of events and SRG matters for adjustment to major life events, the match may be irrelevant to daily events.

Practical Implications

Regarding the practical implications of the obtained results, it can be said that promoting adequate use of coping strategies in the face of daily stressors can positively impact the experience of SRG and can result in a sense of growth in individuals on a daily basis. If people are equipped with coping strategies, they are more likely to navigate through daily stressors in a way that results in learning or growth. Ideally, learning to deal with daily stressors effectively can decrease the likelihood of suffering from prolonged stress and even increases the probability of gaining positive outcomes from daily stressors. Since all three coping strategies were positively related to SRG, it is reasonable to assume that all included strategies can be regarded as adaptive. Education on effectively using coping strategies could empower individuals in

deriving positive outcomes from daily stressors. For example, mental health programs could promote growth after daily stressors through training in adaptive coping responses.

Strengths & Limitations

The strengths of this study are the proximity of measurement to the event in regard to coping strategies. We asked respondents how they dealt with a stressor on the same day of the stressor happening, which increases the likelihood of remembering which coping strategies were implemented. Other studies on coping strategies rely on retrospectively identifying coping strategies, which could be not well remembered. Moreover, this study contributed to research in SRG and suggests that the mechanisms in SRG from traumatic events differs from the daily event. This gives reasons to further investigate SRG in the context of daily stressors.

Some limitations of this study should be noted. Our sample was drawn from a convenience sample and was composed of mainly undergraduate students from European countries. Therefore, the results may not be generalizable to other populations. Moreover, our predictor variable controllability was only measured with one item that was created by the researcher. The reliability and validity of the item is unknown. Furthermore, the current study was part of a larger study and respondents were required to fill in multiple questions about their stressor at the end of the day. It is possible that their concentration and motivation were low in the evening which could have impacted the answers. Moreover, the TIIM application to collect the data was not completely reliable due to technical issues it caused and the loss of data on day six.

Another limitation is the design of the study itself which assumed that respondents cognitively processed the stressor sufficiently enough to answer multiple questions about the stressor at the end of the day. A potential issue is that respondents did not process the event

enough to give a reliable report on their growth because they were still in the process of stress recovery and were still emotionally affected by the recent stressor. For this reason, the reported growth might be biased. For example, the growth scores could be underestimated if participants were still stressed and negatively impacted by the stressor or the growth scores could be overestimated if participants reported growth as a function of self-enhancement or a positive illusion to deal with the stressor.

Another limitation is the complexity of SRG, which was perhaps not accounted for in this study. Even though the coping strategies all significantly predicted SRG in the analysis with only one coping strategy as a predictor, the main effects of the coping strategies acceptance and planning diminished and were non-significant when the second predictor controllability was introduced in the moderation analysis. There could be several reasons for this. For example, confounding variables that were not considered. Another possible reason might be the sample size.

Suggestions for Future Research

Future research could investigate whether daily stressors can lead to lasting growth. For example, by measuring growth not immediately but after a few days, weeks or at different time points. This could help to identify, whether the growth reported on the day of the stressor is still perceived after the impact of the stressor is gone. Moreover, studies could investigate whether reported SRG is related to actual objective growth. For example by comparing reported growth scores with changes in coping ability, resilience, positive affect or other variables related to growth. Future research could also look at specific types of events in order to get a better insight into what kind of daily events lead to growth and the context in which the specific coping strategies are especially effective for growth. Other populatations like working adults could be

studied to investigate differences in age groups and analyse whether the typical events encountered by different age groups play a role in SRG. A general recommendation is to consider more variables that may be important, for example, the flexibility of coping strategies, trait-level coping tendencies or the resolution as well as the severity of the stressor.

Conclusion

To conclude, this study provided evidence for the promoting role of the utilization of coping strategies (problem-focused, emotion-focused and meaning-making coping) on SRG after daily events. The utilization of those strategies seems to promote growth regardless of the perceived controllability of events. While this paper contributed to the little literature on SRG after daily events, there is still more investigation of the mechanisms involved in SRG after daily events needed.

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Appendix A

Please reflect on the most stressful event of the day

Which type of event did you regard as the most stressful event today?

→ Tick the box that best describes your most stressful event today

- Academic pressure (upcoming deadlines/exams, high workload, poor performance)
- Social stressors (argument with someone, let down by friend, family member, partner)
- Job related stressor
- Financial concern
- Health concerns (illness, injury, accident)
- Other (briefly name the event)

Appendix B

please indicate to what extent you dealt with your stressor in the following ways:

1. I thought about how to change the situation. [I didn´t do this at all / I did this a little bit / I did this to a moderate degree/ I did this often / I did this a lot]

2. I thought about a plan of what I can do best in this situation. [I didn´t do this at all / I did this a little bit / I did this to a moderate degree/ I did this often / I did this a lot]

3. I thought that I have to accept that this has happened. [I didn´t do this at all / I did this a little bit / I did this to a moderate degree/ I did this often / I did this a lot]

4. I thought that I have to accept the situation. [I didn´t do this at all / I did this a little bit / I did this to a moderate degree/ I did this often / I did this a lot]

5. I thought that I can learn something from the situation. [I didn´t do this at all / I did this a little bit / I did this to a moderate degree/ I did this often / I did this a lot]

6. I thought that I can become a stronger person as a result of what has happened.[I didn´t do this at all / I did this a little bit / I did this to a moderate degree/ I did this often / I did this a lot]

Appendix C

Please examine how much the following statements are applicable to you based on your day:

1. I learned to be nicer to others. [not at all/ a bit / a lot]

2. I feel freer to make my own decisions. [not at all/ a bit / a lot]

3. I learned that I have something of value to teach others about life. [not at all/ a bit / a lot]

4. I learned to be myself and not try to be what others want me to be. [not at all/ a bit / a lot]

5. I learned to work through problems and not just give up. [not at all/ a bit / a lot]

6. I learned to find more meaning in life. [not at all/ a bit / a lot]

7. I learned how to reach out and help others. [not at all/ a bit / a lot]

8. I learned to be a more confident person. [not at all/ a bit / a lot]

9. I learned to listen more carefully when others talk to me. [not at all/ a bit / a lot]

10. I learned to be open to new information and ideas. [not at all/ a bit / a lot]

11. I learned to communicate more honestly with others. [not at all/ a bit / a lot]

12. I learned that I wanted to have some impact on the world. [not at all/ a bit / a lot]

13. I learned that it's OK to ask others for help. [not at all/ a bit / a lot]

14. I learned to stand up for my personal rights. [not at all/ a bit / a lot]

15. I learned that there are more people who care about me than I thought. [not at all/ a bit / a lo

Appendix D

This questionnaire is conducted to gain insights into stress-related growth after daily events and the following variables; social support, quality of sleep, core beliefs, level of conscientiousness, neuroticism, and openness, and coping mechanisms. Please make sure you read and understand the following statements.

I am voluntarily filling out this questionnaire and understand that I may withdraw from this participation at any time, without any negative consequences and without providing reasons.

I agree that my answers will be stored and saved, for the purpose of the interview and research.

I understand that the answers will remain anonymous. I understand that the other researchers and their supervisor will be able to see the stored and saved answers.

I understand that my personal information will not be misused or shared beyond the study team.

I understand that data gathered from this study might be used for further research.

I give my consent to participate in the study which involves answering certain questions regarding my experience of stress-related growth in daily settings.

I understand that the daily questionnaire will take approximately 10 minutes.

I understand that the one-time questionnaire will take approximately 20 to 25 minutes.

Yes / No

Appendix E

Welcome.

You have been invited to participate in a BSc Thesis study for Psychology regarding

stress-related growth (SRG). This study is conducted by Hanna Ausländer, Evrim Kayikcio,

Marlyn Kolenbrander, and Pia Kronenfeld under supervision of Y. Namer (PhD.) and M.

Radstaak (PhD.) from the Faculty of Behavioural, Management, and Social Sciences at the

University of Twente. This study has been approved for conduction by the Ethics Committee of

the Faculty of Behavioural, Management and Social Sciences at the University of Twente.

In this study, you will be filling in a daily questionnaire regarding daily stressful experiences

and stress-related growth considering coping mechanisms and personality traits. This daily

questionnaire will take around 10 minutes every day to complete. At the end you will also

complete a survey for variables that only need to be measured once. This survey will take

around 20 to 25 minutes to complete. The data that is gathered will be used and analyzed solely

by the researchers mentioned above.

Your participation in this study is entirely voluntary and you are allowed to withdraw at any

time during the process. However, in case of withdrawal you will not receive the SONA points

as stated on the information section. To the best of our ability your provided answers will

remain confidential. Therefore, the provided results and answers will be presented anonymously

in the report. Personally-identifiable data will not be stored permanently.

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If you provide your email below, you are interested in the research results and would like to receive these by email.

email

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