Bachelor's Thesis

Mindset Matters but can it be changed – using video to change an unfavourable Stress Mindset

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Abstract

Background: Stress mindset can be seen beliefs that people use to guide them with expectations to a specific response (Crum, Salovey, & Anchor, 2013). It impacts the motivation, well-being and learning of a person and thus changing the mindset of a person can improve mental health as well as their general well-being. The aim of the current study is to examine whether an educational video with information on the positive effects of stress can change someone's mindset. Furthermore, the study examines whether the manipulation is weaker one week after the manipulation and if age moderates of the condition on the mindset change from baseline assessment to the post-test in any way.

Method: 136 German-speaking participants were recruited to partake in a randomized control trial using convenience sampling. After baseline, participants were assigned to the experimental group (n = 50) or a group control group (n = 49)which received a video about Immanuel Kant and the experimental group, which received an educational video about the positive effects of stress and a "stress-is-enhancing" mindset. The data were collected, directly after the video and one week later. All data was gathered with online questionnaires.

Results: A repeated measures analysis showed that the experimental group scored significantly higher, by showing a more "stress-is-enhancing" mindset than the control group in at the post-test ($p < .05$). Furthermore, a decline after the manipulation was recorded at the follow-up test. However, the change in mindset from baseline to follow-up test remaining significant ($p<0.001$), indicating a more "stress-is-enhancing" mindset. No moderation of the agegroup on the relationship of the condition to the outcome was found.

Discussion: Overall, a small and simple intervention showed remarkable effects in changing the stress mindset, at least temporarily. Since age did not affect the manipulation, the video was suitable for every age group. However, the long-term effects time on the strength of the mindset change should be investigated in future research.

Introduction

Consequences of stress

Stress is viewed as being unhealthy due to its negative consequences on the psychological level as well as the physiological level (Vitett, Anton, Cortizo, and Sali, 2006). Past research has shown that a high level of chronological stress leads to a decrease in physical health such as cardiovascular diseases, hypertension or the reduction of the efficiency and productivity of the immune system (Cohen et al., 2007; Glaser & Kiecolt-Glaser, 2005; Quick & Horn, 1987; Schneidermann, Ironson, & Siegel 2005). Besides the physiological threat to health, stress has psychological consequences as well. Some consequences of stress on a psychological level are depression, burn out, eating disorders, anxiety disorders and substance abuse (Schneidermann et al., 2005). Thus, distress is usually defined as a person's perception of the demands the environment has on themselves to exceed their own belief of what one's capacity is (Cohen, Janick-Deverts, Brody, Chen, & Miller, 2007). This is similar to Greenberg, Garr, and Summers (2002), who explain that stress is defined by the situation in which an individual experiences real or perceived stress. Individuals experience stress when they have trouble meeting a real or perceived personal need, for example, food, social interaction or a deadline for a project.

Potential positive consequences of stress

The view that stress is unhealthy is partly reinforced by the news, such a newspaper giving tips on reducing stress, and most research being focused on how to handle stress or eliminate the effect on the individual (Lazarus & Folkman, 1984). But besides the negative consequences of stress, a certain level of stress can also be beneficial for one's health. Stress can boost performance and productivity when combined with relaxation exercises such as listening to music (Linnemann, Dietzen, Strahler, Doerr, & Nater, 2015). The areas in the brain that distribute hormones and attention are influenced by stress, which in turn allows people to increase their focus on the task and thus work more efficiently (Fay & Sonnentag, 2003). The potential benefits of stress together with the threats to individual's health underlines the need to investigate stress as an important factor in helping individuals become more effective and focused without having to suffer from the negative effects and thus keeping overall well-being to a maximum. Thus, finding a way to reduce the negative effects of stress might increase general well-being.

Eustress

To help make the difference in stress clearer, Selye (1974) implemented the term "eustress" which is defined as the opposite of "distress". Eustress is associated with a healthy bodily state and a positive feeling, while distress results in negative feelings and a disturbed bodily state (Lazarus, 1993). Crum, Salovey, and Achor (2013) suggest that eustress leads the body and brain to an increased focus which in turn allows the person to perform better. Besides the positive bodily implication, eustress was shown to be positively related to hope and meaningfulness (Lazarus, 1993), and seen being as a motivator for challenges that an individual wants to overcome by enhancing self-esteem (Crum et al., 2013; Swann, Chang-Schneider, & Larsen McClarty, 2007). The distinction between eustress and distress is crucial, as stress can be perceived positively and negatively. The positive view and effects enhance one's life while distress can inhibit life and thus the stress mindset of a person impacts the way people experience stress. Consequently, taking a look into possible ways to emphasis eustress in people's mindset might be a way to alter the stress mindset.

Stress mindset

A mindset can be conceptualized as a mental frame that helps to guide an individual to certain expectations which in turn results in specific responses (Crum et al., 2013). For example, when a person is thinking about the upcoming tasks they have to finish in little time, they might feel panic and thus work less accurate which could be partly due to the negative view on stress. Dweck (2006) distinguished two types of mindsets: The Fixed versus Growth Mindset. She defined a *fixed mindset* as viewing some personal characteristics such as intelligence as not changeable but rather permanent. In contrast, the "Growth Mindset" views these characteristics as being changeable. As seen in a study by Dweck (2006), where students who exhibited a growth mindset, were considered more challenge seeking and more curious, but both mindsets impacted the learning motivation. Research indicates that having a fixed intelligence mindset leads to less effort while a growth mindset resulted in positive strategies in achieving, learning goals and positive effort beliefs (Blackwell, Trzesniewski, & Dweck, 2007; Hochanadel & Finamore, 2015). When looking at the results of the previously mentioned research, the mindset on intelligence can be viewed as changeable. As shown by previous research mindsets appear to be changeable, indicating that the mindset of stress might be able to change as well, which might indicate a possible starting point for improving people's lives (Blackwell, Trzesniewski, & Dweck, 2007; Crum et al.,2013).

This fixed and growth mindset theory was applied to stress by Crum et al. (2013), who developed the Stress Mindset Model. Their research indicated that there were two mindsets regarding stress. The first one being "stress-is-enhancing", which was defined as "the extent to which one holds the belief that stress has enhancing consequences for various stress-related outcomes such as performance and productivity, health, and well-being, and learning growth"(p. 716) and the second mindset being "stress-is-debilitating" which was defined as "holding the belief that stress has debilitating consequences for those outcomes" (Crum et al., 2013, p. 716). The results from Crum's study on the different stress mindsets also indicate that the "stress-is-enhancing mindset" of individuals scored higher in physiological and psychological health due to a higher level of energy and satisfaction with their life in comparison to the stress-is-debilitating mindset, which appeared to facilitate psychological and physiological negative consequences (Crum et al., 2013). Thus, research shows that stress has not only negative consequences and holding a "stress-is-debilitating" mindset can impact one's personal life negatively, a "stress-is-enhancing" mindset, on the other hand, might lead to better mental and physical health. Besides the positive mental and physical improvements, stress-is-enhancing mindset can boost one's efficiency by filling the body with energy to complete, for example, unfinished tasks (Park & Helgeson, 2006, Crum et al., 2013). However, it is not yet known whether people with a debilitating mindset can change this negative view towards a stress-is-enhancing one. Therefore, finding the factors that can impact the possible change in one's mindset is necessary for designing future interventions, so that the stress-is-debilitating mindset can be changed to a stress-is-enhancing mindset to increase people's general well-being.

Changeability of mindset

After establishing the existence of mindsets, it is necessary to understand that different factors can influence the degree of mindset change. For example, the "stress-is-debilitating" belief that can arise from the overwhelming stress that can be experienced without the proper ability to deal with stress is one of the stress mindsets. When inspecting the "stress-is-debilitating" mindset, the question arises how this mindset can be changed (Le Fevre, Matheny, and Kolt, 2003). Studies on the changeability of mindset were conducted by Good, Aronson and Inzlicht (2002), Aronson and Inzlicht (2003) and Crum and colleagues (2013) indicating that videos or workshops can be used to change the mindset. For example, some students were part of a pen-pal program in which they had to convince another person, their new pen-pal, that intellectual development has a malleable nature within the human brain.

They had students with two different types of mindsets based on intelligence, with the first one being that “intelligence is malleable” and the second one being “intelligence is fixed”. These mindsets were reinforced by the researchers by providing information that fitted each mindset accordingly. The results indicate that students who had the “intelligence is malleable” worked harder and had higher grades than those students with the “intelligence is fixed” mindset (Aronson, Fried, and Good, 2002). In addition, Good, Aronson, and Inzlicht (2003) conducted a study to examine whether these mindsets could be changed by high-school students being mentored by college students. The results suggest that intelligence is variable and not fixed by gender or race. Next, the students were tested in math and reading achievements to see whether a reinforcement of a different mindset can influence the students' academical achievement by not sticking to the “intelligence is fixed” mindset. This was done by letting the mentor colleague students emphasise either a fixed or growth mindset in their students. The students who were prompted with a new mindset scored significantly higher than the control group, indicating that a change in their mindset had an impact on their academic level of learning, by changing from “intelligence is fixed” to the “intelligence is not fixed” mindset. The fixed mindset appeared to reduce the pupil’s motivation for learning. In conclusion, it appears that a positive mindset provides overall better well-being as well that a mindset can be altered to a degree.

Crum et al. (2013) provided some evidence that *stress* mindsets can *also* be changed. For example, in their research, videos were shown to the participants that contained scientific information about the effects of stress on performance, learning, and health. The effects of showing videos of the reaction from the body to stress on the stress mindset of the participant were tested. The study demonstrated that both the information provided in the different videos, stress-is-enhancing and stress-is-debilitating, had an impact on the mindset of the person watching by exposing the participants with information about eustress or distress. The participants that changed their mindset from a “stress-is-debilitating” mindset to a “stress-is-enhancing” mindset reported an increased quality of life, for example, the positive effects on performance, learning and health were most predominant in the people that changed their mindset to stress-is-enhancing. Thus, indicating that their life overall appeared to be better. By also showing a decreased level of depression and anxiety was a positive effect that came with a “stress-is-enhancing” mindset, and an increase in the participants overall quality of life was reported (Crum et al., 2013). Other studies that aimed at control of stress in the own life by providing a stress management course indicated a change in the stress mindset when focusing on the “stress-is-enhancing” information (Wegmann, Moshmann, and Ruby, 2017).

Research indicates that it is possible to change the mindset of a person by using different methods all aiming at focusing the information to fit a certain type of mindset. Thus, keeping the influences on a person that can impact the level of change from a negative to a positive mindset in mind when designing an intervention seems beneficial.

Possible Influences on the Changeability of the Stress Mindset

A stress mindset is not fixed but can be changed as seen by the previous studies such as Crum and colleagues (2013). However, the way of changing this mindset is important and thus finding a good and effective way of doing this is crucial. Finding a suitable medium to deliver information to participants is important for finding the most effective intervention. Crum suggests that the medium of video is effective and allows to provide information in a fast but informative way (Crum et al.,2013). The possibility nowadays to be able to watch a short video almost anywhere, due to mobile phones and tablets and other personal technological gadgets strengthens this view. Furthermore, a video allows for audio, text and visual cues to be present if wanted, thus allowing to provide multiple inputs of information using one medium. Besides the medium, other aspects might influence the strength of an intervention.

Thus, finding the aspects that influence the stress mindset is necessary. Different psychological studies suggest that personality may change with age (Damian, Spengler, Sutu, &Roberts, 2019; Srivastava, John, Gosling, & Potter, 2003). Both pieces of research suggest that personality does not remain the same once adulthood is reached but rather continues to evolve and change over time through experience and outer influences. According to Lucas and Donnellan (2008), older people score lower on the trait of openness, suggesting that age can predict the level to which people are inclined to change their views and ideas based on what they experienced. Thus, this difference in traits might have an influence when trying to change a person's mindset. This is also in line with findings by Tulviste, Kall, and Rämmer (2016), who also found that people over 30 valued openness to experience less than people under the age of 30. As older people are more experienced with life and the levels of stress an average day lays on oneself might suggest that their view on how they perceive stress is different from that of younger people.

Another aspect that might influence the level of mindset change is the time that passes. For an intervention, the effect is most often strongest immediately at the manipulation but digresses over the course of several days or weeks and is strongly depended on the strength of the intervention. The study by Crum and colleagues (2013) used videos of, 3

minutes length, over one week repeatedly to induce a mindset change. However, the results did not show whether the participants kept the change in their mindset when not receiving the videos anymore. Consequently, figuring out a way to permanently change someone's mindset is a factor that influences intervention design.

Present Research

The aim of the current study is to examine the use of a video to change someone's stress mindset towards a "stress-is-enhancing" mindset. Furthermore, this paper aims to contribute to research by providing more insight into the changeability of the stress mindset by using educational video and testing its effectiveness in transferring information to participants on a mindset. Furthermore, this study aims to see to which extent do people over the age of 30 change their stress mindset to a stress-is-enhancing mindset compared to under the age of 30 and to what extent is the intervention effective over three weeks.

The first aim of this study is to investigate the effectiveness of the video on the mindset change. Thus, I hypothesise:

H1: People in the experimental condition score significantly higher on stress-is-enhancing mindset, after watching an educational video about eustress, at post-test than the control condition.

Another aim is to distinguish the effectiveness by agegroups, to check whether age plays a significant role in designing future interventions. Thus, I hypothesis that:

H2: People who are older than 30 (≤30) show a lower level of a mindset change than people under the age of 30

Method

Design

This study used a parallel double-blind randomised controlled trial with one experimental condition and one control condition and allocating the same ratio of participants to each group. The study used online questionnaires to determine wellbeing at baseline, post-test and follow-up (one week after the post-test). The study was approved by the Ethics Committee of the University of Twente (nr: 191189). All participants gave their consent before taking part in the online study.

Participants and Procedure

The study had the restriction of only German-speaking adults that were 18 years or older and owned a legitimate email address with a sufficient internet connection to partake in the online assessments. The participants were free to answer the questionnaires whenever and wherever they liked, within a set timeframe of several days and their participation was voluntary. To recruit the participants, a self-selection method via a message on social media as well as a referral system by face-to-face recruitment were used. The recruitment message can be found in Appendix A. Out of the 184 recruited participants, 136 completed the baseline questionnaire. However, out of the 136 participants, only 99 completed all questionnaires resulting in a complete sample size of 99 participants. At baseline, participants first gave informed consent and then completed demographical information such as gender, age, education, and employment, as seen in Table 1.

Table 1

Mean Characteristics of the Sample with Total Sample Size (N=99)

Characteristic		Experimental Group (N=50)	Control Group (N=49)	P
Age, years *M* (SD)		36.16 (16.36)	37.32 (16.09)	.51
Gender, *N* (%)				.50
	Female	30 (50)	30 (50)	
	Male	18 (48.4)	20 (52.6)	
	Preferred not to give	1		
Education, *N* (%)				
	Lower	11 (64.7)	6 (35.3)	.92
	Intermediary	16 (53.3)	14 (46.6)	
	Higher	23 (44.2)	29 (55.8)	
Employment, *N* (%)				.60
	Full-Time	34 (50.7)	33 (49.3)	
	Part-Time	16 (50)	16 (50)	

Intervention Procedure

At T1, participants were randomly assigned to one of the two groups "stress-is-enhancing-video" (n=50) and "control video-categorical imperative" (n=49). Next, participants received an email with the control or manipulation video. The participants of the experimental group received information about the stress-is-enhancing mindset in the form of a video that was created by the researchers based on the video material used by Crum et al. (2013) but translated into German. The information was about the positive nature of stress and how it can be beneficial to have a stress-is-enhancing mindset on personal performance and health, such as the heightened adrenaline increasing one's performance. A transcript of the video can be found in Appendix B.

The control condition received an informational video about the categorical imperative, which is an ethics designed by Immanuel Kant that deals with the question of the moral law such as "do not steal if you like to be popular", which was in similar length to the control video and contained no information regarding stress. After the video, a short information check was conducted, in which participants were asked to paraphrase the content of the video. This information was used to help assess that the participant understood the information in the text or video. After the last questionnaire, the participants were debriefed by explaining the real goal of the study and giving them the possibility to see both videos.

Measures

To measure *stress mindset*, the 8-item Stress mindset measures-general (SSM-G) was used to assess participant's attitude towards stress (e.g. "The effects of stress are negative and should be avoided") (Crum et al.,2013).

The participants were asked to answer the questions based on a 5-point Likert scale that ranged from *strongly disagree* (0) to *strongly agree* (4). Since four items (1,3,5,7) were negatively formulated, they were reversely coded. Afterwards, the mean scores were calculated with a higher score indicating a more "stress-is-enhancing" mindset while lower scores indicating a more "stress-is-debilitating" mindset. The SMM questions had an internal consistency (α =.86) with the responses following a normal (Crum et al., 2013). The current sample had a Cronbach's alpha range of (α=0.89 to .91) over all measuring points, which indicates a good internal consistency.

Statistical analysis

SPSS version 24 and A significance level of <0.05 were used for the statistical analysis. Participants were excluded if they were not 18, didn't speak German or didn't complete all questionnaires. Firstly, the data were cleared for missing values as these were missing at random. Following, a missing values analysis (Little's MCAR test) was used to check whether the data were missing completely at random. The test results indicate the missing data in the post-test and the follow-up test as completely missing at random (χ^2 =53,09; DF=40; p=0.08) while using the expectation-maximization algorithm which is highly valid and reliable (Blankers, Koeter, & Schippers, 2010). Data were chosen to be discarded when the participants who had missing data failed to fill out complete time-points, for example, missing post-test values. Out of the 136 participants who completed the baseline 37 were removed due to missing data at random and in one case, the person did not see a video thus not receiving the manipulation. Thus, an overall sample size of N = 99 was used for the data analysis.

To ensure that the randomisation was successful, and the stress mindset at baseline were compared between both groups using an independent sample t-test and chi-square. To test for the effectiveness of the intervention on the participant's stress mindset, a repeated measure general linear model (GLM) was used with two groups and three time-points. Improvements from baseline to post-test and from post-test to follow up were considered a change to "stress-is-enhancing" mindset from a "stress-is-debilitating" mindset when the scores of the SMM-G increase.

To examine for the interaction effect of agegroups on the relation between the condition and the stress mindset change, a multiple linear regression approach was used from the PROCESS macro created by Hayes and Preacher (2014). To examine the moderation of age on the level of changing a stress mindset, multiple linear regression was conducted using the PROCESS macro created by Hayes and Preacher. Condition was entered as the independent variable, agegroups (<30, >30) as the moderator variable and the SMM-G score change (post-test T2 – baseline T0) as the dependent variable. To prevent any non-normality concerns, bootstrapping sample of 5000 was used when analysing the models. Hayes and Preacher (2014) support this procedure and a more confident moderation analysis can be applied. If the 95%Bias Corrected and the accelerated confidence interval for the interaction effect does not contain the value zero, a moderation is significant.

Results

The first aim of this study was to test whether a stress mindset can be changed through the use of an educational video. For this, both groups were compared through the baseline assessment, post-test and the follow up in their stress mindset. The descriptive data on the test results are shown in Table 2. While the experimental group showed a more "stress-is-debilitating" mindset, the control group showed a neutral mindset. However, both conditions showed an improved mindset, which was shifted towards "stress-is-enhancing" when comparing the baseline scores with the post-test and follow-up score. The experimental group shows a significant higher score ($p< 0.05$) than the control group at the post-test indicating that the intervention had a positive effect on the group.

Table 2

Means and standard deviation for stress mindset at all measuring points.

	Intervention Group	Control Group	Total	p*
SMM-G *M* (SD)				
Baseline	2.73 (.82)	3.01 (.56)	2.86 (.71)	.05
Post-test	3.54 (.77)	3.16 (.82)	3.35 (.71)	.01
Follow-up	3.21 (.80)	3.10 (.60)	3.16 (.71)	.45

*. Independent-sample t-tests were computed cross-sectionally for comparing both groups at each measuring time on their stress mindset.

Repeated Measures GLM for the Stress Mindset Change

To test whether a significant difference in the stress mindset change after the intervention. A repeated measures GLM was used to determine this change through the three measuring points. Mauchly's test of sphericity indicated that sphericity was not assumed $\chi2(2) =15.43$, $p < .001$. Thus, a Greenhouse-Geisser correction was used ($\varepsilon = .87$) in order to adjust the repeated measures GLM.

Time appears to have a main effect on the stress mindset. This is indicated by the post-test scores being significantly higher compared to the baseline scores for both conditions, $F(1.74, 168.92) = 42.50$, $p < .001$, with a partial $\eta^2=.31$. The post hoc tests showed a statistically significant increase in the participant's stress mindset from a "stress-is-debilitating" to a "stress-is-enhancing" mindset from the baseline assessment to the post-test (.49), $p < 0.001$. However, there was a significant decrease for the whole sample when

comparing the post-test to the follow-up results (-.19), $p < 0.001$. This indicates that both conditions decreased again from a "stress-is-enhancing" mindset towards a "stress-is-debilitating" one. Furthermore, a significant interaction effect of time with the condition on the stress mindset change was found $F(1.74, 169.92) = 19.37$, $p < 0.001$ indicating that the positive change of the stress mindset over time was stronger in the intervention group than the control group. When looking at the result, it can be stated that the intervention has a better effect in the first part, from baseline to post-test. Figure 1 shows the stress mindset change during the three measuring points indicated per condition.

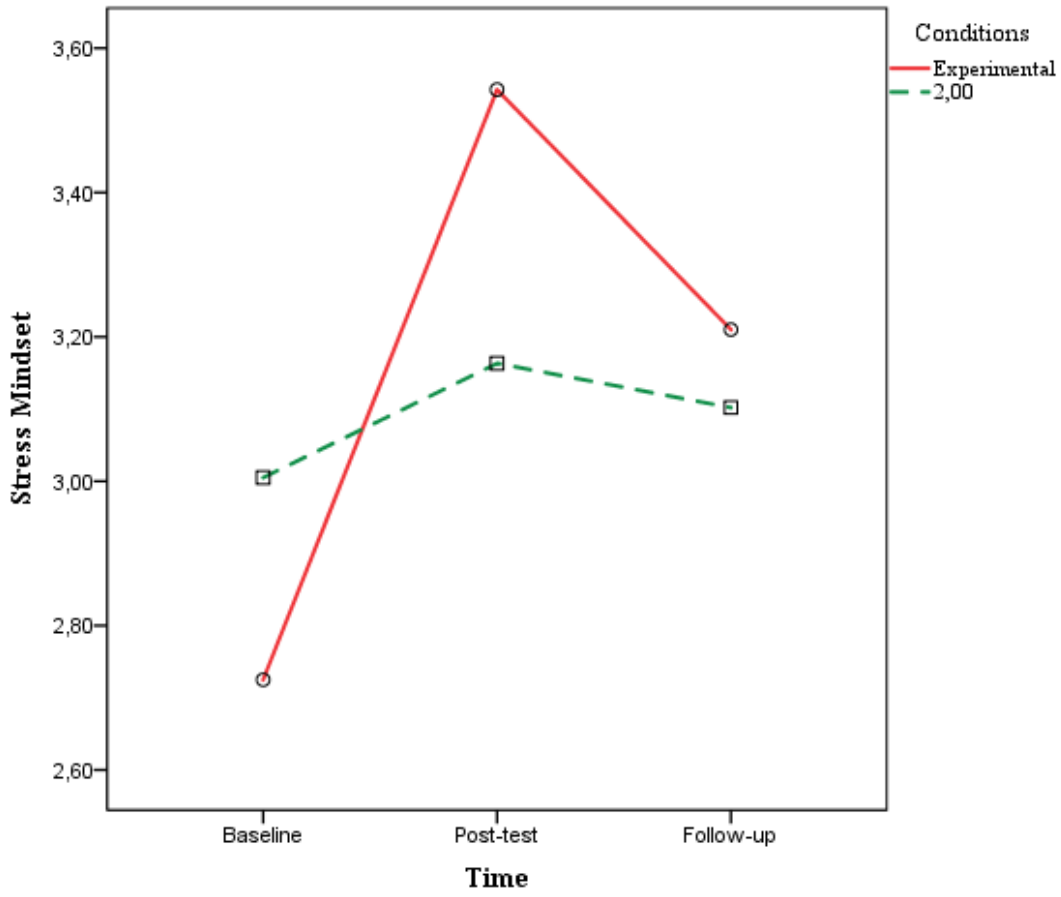

Figure 1. The Stress mindset over time per condition ($N = 99$, $n_{experimtenal} = 50$, $n_{control} = 49$).

Moderation Analysis

To check whether age had a moderating effect on the intervention, a moderation analysis was performed using the PROCESS tool of Hayes, as seen in Table 3. Overall the model was found to be significant ($p < 0.001$), but no moderation was found as the interaction effect was not significant ($p = .35$). Thus, the interaction between the condition and the outcome of the mindset change were not moderated by the agegroup. This indicates that the

agegroup did not have an impact on the effect on the degree of stress mindset change by this intervention.

Table 3

Linear model of predictors of stress mindset (Agegroup)

	b	t	95% CI	p
Constant	.26	5.28	.86, 1.90	.00
Condition	.16	-3.41	-.87, -.23	.00
Agegroup	.39	.58	-.54, 1.00	.56
Interaction (Condition x Agegroup)	.25	-.94	-.72, .26	.35

Model statistics. R^2*=.24, F(3, 95)= 10.25*

Discussion

This study aimed to test whether the change from a stress-is-debilitating mindset to a stress-is-enhancing mindset with the use of an educational video was possible. Furthermore, the study aimed at answering whether time affects the strength of the intervention and whether age moderates the outcome of the intervention. To do this, an RCT with a sample of 136 German-speaking participants was conducted by assessing them over the course of three weeks.

This study showed that a simple intervention such as providing people with a short video containing information about the productive use of stress could improve their stress mindset. As the results indicate, the experimental group showed a shift in their view on stress from a debilitating to an enhancing one. These findings are supported by previous studies, for example, that a stress mindset is not a fixed matter but can rather be changed easily with interventions (Crum et al., 2013). When comparing the results of the present study to findings in other similar studies, the overall mindset change was not as strong in this intervention than others (Crum et al., 2013; Wegmann et al., 2017). While the present study found a significant difference at the manipulation, one week later the difference was not significant anymore. In contrast, Crum had significant differences throughout the measurements (Crum et al. 2013).

This difference in outcomes and strength after one week might be accounted for by the different study designs. When comparing the manipulation designs of Crum and the present study, it becomes clear that the manipulation was not repeated multiple times within the present study, while Crum showed the video multiple times, which can influence the level of change. Another aspect is the level of manipulation. In this study, the manipulation used a short three to a four-minute-long video while Wegmann used a stress management training. Thus, a smaller effect of the mindset change can be expected compared to Wegmanns intervention. This indicates that exposing the participant more often or by giving them more organised ideas and practical knowledge to handle stress can enhance the impact on the mindset change. Nevertheless, the level of change that the present study provided with such a short informational video is remarkable.

Another aspect that is important to mention is the effect of time on the strength of the intervention. Time is a reoccurring factor that has to be taken into account when designing interventions. This was also the case for this intervention. Directly after the manipulation, the change in mindset in the experimental condition is quite high but reverts after one week. Although it is important to state that the change from the beginning to the last timeslot was still an improvement. However, it is not possible to predict whether the participants will stay at that level or whether the mindset will revert to the starting point. Nevertheless, the differences between the baseline and the follow-up test indicate that although there is a loss of strength of the effect over time the intervention, in general, was effective as it changed the mindset even after one week towards a “stress-is-enhancing” mindset. People might have watched the video and were influenced how they completed the questionnaire, but once they returned to their life without the video in mind, they don't have the video in mind when feeling stressed.

When looking at the groups, it can be stated that surprisingly the experimental group scored a slightly more stress-is-debilitating mindset at the baseline than the control group, who had a more neutral view on stress. This already negative mindset might be harder to change or even easier to change than a neutral mindset, which was not tested within this study. However, a stress-is-debilitating mindset is more common, which is in line with Crum et al. (2013), who had both groups start out with a baseline that was more stress-is-debilitating. This means that the participants felt stress as unfavourable, which is also in line with another study, which indicates that the more prevailing mindset on life was that it was hard and short (Norton, Anik, Aknin, & Dunn, 2011)

Besides the change of mindset over the course of this study, the effect of the participants' age on the strength of the mindset change was measured. The outcome of this study, which shows that older people are not less likely to change their mindset than younger people, is contradicting to literature found. These findings contradict findings that people above the age of 30 appear to be less likely to change their attitudes and values (Krosnick & Alwin, 1989). This shows that older people are not less likely to change their mindset than younger people. When comparing these results, the question of whether just the stress-mindset changes easily or whether values and attitudes do. A study suggests that the values of a person appear to remain rather stable over time, while the people's attitudes change based on outside factors such as a job or the situation one is in (Luskin, Fishkin, &Jowell, 2002). This indicates that there might be other possible mindsets than can be changed and thus maybe help change other aspects of people's lives too. To be more precise it is important to establish whether stress is a value or an attitude since it can be influential in designing interventions that are not just based on attitude but values as well and allow to apply interventions in broader areas of people's lives. Consequently, finding out whether mindsets consist of specific values or attitudes is possible.

Strength and Limitations

The study makes some contribution to current literature about the stress mindset and its implication in interventions, by providing more data on the changeability of a stress mindset as well as the effectiveness of video as a medium to provide information. One major strength this study shows is the information it provides on the stress mindset and the corresponding measures such as the SMM-G and its possible combination with interventions. As the SMM-G is a short questionnaire that does not take a lot of time to answer but keeps being validated, might be useful for future designs, so that more data on the stress mindset can be found. Thus, these outcomes can provide feedback and insight into possible ways of improving people's general well-being by taking steps into finding the best way to change someone's mindset. Another positive aspect was the randomisation of the study, as it was conducted by another independent researcher, who neither recruited participants nor analysed the data gathered from the participants. Consequently, there was no bias in allocating the participants in the groups. Another strength of this study was the sample. Although a larger sample would have been preferred, the descriptive were diverse. The age mean was around 30, and the sample did not only include students but also employed people as well. Thus, this

sample represents the general population more than just a sample of students and consequently making the findings more generalizable.

However, the study also shows some limitations. For one, the manipulation used was simple and was only shown once during the whole intervention and showed either a stress-is-enhancing video or a neutral video. A repeated manipulation, together with a stress-is-debilitating video might have made the contrast between the groups stronger in the end and would have provided more insight into the changeability of the mindset in both directions positive and negative. Crum and colleagues (2013) indicated that a change towards “stress-is-debilitating” mindset was also possible when shown videos with information about distress. Another aspect to consider is that the video and the questions were translated and proofread by the researchers and some writing errors and a swapped Likert scale were included and the difficulty of understanding the information was not tested. Thus, the effectiveness of the video might not be at an optimal level, which results in a weaker manipulation. Furthermore, a video that was validated might provide a stronger belief in the information provided. Although Crum's video was used to design the video for this intervention, the video might be different to understand.

Future Research

To improve the findings and to use the insight gathered from this study, there are some aspects that future research might consider. Firstly, the question arises whether a video is the best solution for providing information to change someone's mindset. Since this study only provided videos, it might be easier or more effective to use text or audio together with a video to maximize the effectiveness and the sensory input. Finding an easy but effective way might help that future research and intervention designs work as good as possible. Thus future research can differentiate between different types of providing the information to the participant such as a seminar or a detailed text to help find a way of distributing the possibility of changing someone's mindset so that everyone can do so if they want to. Furthermore, a more in-depth study might provide more feedback on the overall improvement of the mindset. This study collected the data over the course of one month and although the last timeslot shows that the experimental condition still exhibited a more stress-is-enhancing mindset compared to their baseline measure, they might revert to the baseline level after another weeks or month. Thus, the usage of repeated exposure to the information and whether that might affect the decrease of effectiveness over time is interesting to investigate. As the effectiveness of the intervention is one of, if not the most effective part, finding an

intervention that allows for the mindset change to be for a long period of time is important. This might increase the value the society sees in the intervention. Since the idea of having to, for example, watch a video or read a text several times a week to maintain a different mindset can be seen as annoying and thus fewer people might be inclined to partake in an intervention. However, if future research finds a method that allows for a persistent mindset change, it can be impactful in the mental health of people in society. As mentioned, a "stress-is-enhancing" mindset provides more mental health benefits as well as overall better quality of life. Thus, a good intervention can prove beneficial for so society in general.

Conclusion

This study provides evidence that it is possible to change someone's stress mindset from a "stress-is-debilitating" towards a "stress-is-enhancing" one, regardless of their age, by showing them an educational video of the positive effects of stress. This means that showing a video that provides information on the positive side of stress to participants helps to change their stress mindset for a short period. Thus, future research can determine whether there are more suitable or effective ways of providing a stress mindset change. The mindset change appears to be influenced by the time that passes from the manipulation, thus resulting in the participants decreasing towards a "stress-is-debilitating" mindset after the manipulation but remained improved in total.

Furthermore, this study gives insight into the changeability of mindsets based on the age of a person and that the mindset does not appear to be more fixed for older people than assumed, but rather remained similar between younger people and older ones. This indicates that an intervention is possible for all age groups. So overall, the study provides a good basis that allows future research to improve the concept and design to more effectively change the mindsets of people and thus give possible ways of improving the overall well-being of the participants.

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Appendices

Appendix A: Recruitment message.

Hallo!

Im Rahmen unser Bachelor- und Masterarbeit im Fachbereich Psychologie an der University of Twente (Niederlande), sind wir auf der Suche nach Teilnehmern an unserer Online Studie.

Bist du interessiert daran, wie Menschen neue Informationen aufnehmen? Dann nimm teil und hilf uns!
Dafür füllst du wenige Fragebögen aus, die uns dabei unterstützen dies herauszufinden. Insgesamt brauchst du dafür ca. 20-30 Minuten. Deine Daten werden bei uns anonym aufgenommen und nicht an Dritte weitergegeben. Und zu jedem Zeitpunkt kannst du deine Teilnahme beenden, ohne einen Grund nennen zu müssen.

Wir würden uns über jeden Teilnehmer ab 18 Jahren freuen!

Klicke auf den folgenden Link, um gleich loszulegen!

Appendix B: Transcript of the video.

1 Die meisten Menschen nehmen an, dass sie ruhig und stressfrei sein müssen, um auf höchstem Niveau funktionieren zu können.

2 Aber tatsächlich treibt uns Druck zu Bestleistungen an

3 Bei Stress wird Adrenalin durch den Körper gepumpt.

4 Es versorgt **unser** Gehirn und **unseren** Körper mit Blut und Sauerstoff

5 Es erhöht die Konzentration und die Aufmerksamkeit

6 Diese Stressreaktionen verbessern Ihre:
6.1 Konzentration, Entscheidungsfindung, Erinnerungsvermögen, Leistungsfähigkeit

7 Denken Sie über folgende Beispiele nach:

8 Unter normalen Umständen verarbeitet das Gehirn 40 Bilder pro Sekunde

9 Unter Stress nehmen wir die Zeit langsamer wahr. Dadurch kann unser Gehirn in der gleichen Zeit mehr Reize verarbeiten.

10. Die beeindruckendsten Leistungen werden in den stressigsten Momenten vollbracht:

11. Operationen

12. Kampffliegen (eig Kampfflieger aber passt semantisch nicht)

13. Gewöhnliche Menschen können außergewöhnliche Dinge vollbringen, wenn sie auf die Probe gestellt werden

14. Forschungsergebnisse zeigen, dass die Stressreaktionen des Körpers das Erinnerungsvermögen und die **geistige** Leistungsfähigkeit steigern.

14.1 Cahill et al. (2003). Journal of Learning and Memory

15. Eine Studie aus Harvard zeigt:
Stärkere **körperliche** Erregung während einer Aufnahmeprüfung steigert die Leistung

16 Die einflussreichsten Anführer trafen ihre besten Entscheidungen während großer Krisen.

17 Lincoln

18 Ghandi

19 Churchill

20 Denken Sie über Ihr eigenes Leben nach:

20.1 Als Sie Ihre persönlichen Bestleistungen erbracht haben...
20.2 War es nicht Stress, der Sie dazu angetrieben hat?

21 Die Stressreaktion erhöht Ihre **geistige** Leistungsfähigkeit.

22 Besonders wenn es am meisten darauf ankommt.

23. Stress ist leistungsfördernd.

24. Nutzen Sie ihn.

25. Lassen Sie Stress Ihre Leistungen verbessern

Eine Studie aus Yale und Cambridge zeigt:
Wenn Menschen von den positiven Effekten von Stress wissen, sind diese Effekte noch größer.

Die Überzeugung, dass Stress positiv ist, verbessert die
Leistung
Gesundheit
Zufriedenheit

Menschen, die Stress als einen notwendigen und positiven Aspekt des Lebens betrachten, sind im Durchschnitt erfolgreicher und glücklicher.

Sehen Sie Stress als positive Herausforderung,
dann produziert Ihr Körper eine optimalere Menge des Stresshormons Kortisol.

Das ist besser für Ihre Gesundheit.
Und dadurch können Sie mehr leisten.

Sehen Sie Stress als positive Herausforderung,
werden Sie die Herausforderung besser meistern,
als wenn Sie Ihr aus dem Weg gehen.

Wahrscheinlich haben Sie dabei auch mehr Freude.