



BACHELOR THESIS

PROACTIVE COPING AND PERSUASION IN STRESS- MANAGEMENT MOBILE APPLICATIONS

Kristina Dreibrodt

S1981900

1. Supervisor: Annemarie Braakman-Jansen
2. Supervisor: Christian Wrede

Faculty of Behavioral, Management and
Social Science (BMS)

University of Twente

Table of Contents

Abstract	- 1 -
Introduction	- 3 -
The Concept of Stress	- 3 -
Coping as a Stress Response	- 4 -
Stress-Management Interventions and Technological Possibilities	- 5 -
Research Aim and Hypotheses	- 8 -
Method	- 9 -
Design	- 9 -
Participants	- 9 -
Materials	- 10 -
Storyboards	- 10 -
Perceived Acceptability Scale	- 11 -
Perceived Stress Scale	- 12 -
Proactive Coping Scale	- 12 -
Procedure	- 12 -
Data Analysis	- 13 -
Results	- 14 -
Discussion	- 16 -
Strengths, Limitations, and Recommendations	- 18 -
Strengths	- 18 -
Limitations	- 19 -
Recommendations	- 19 -
Future studies & Conclusion	- 20 -
References	- 22 -
Appendix A: Informal Consent	- 26 -
Appendix B: The Online Survey	- 27 -

Abstract

Background: This thesis explains the different kinds of stress as well as some ways how to cope with stress. One strategy to deal with stress is called proactive coping. Proactive individuals are high in regulatory goal attainment behavior and self-management. Nevertheless, people may need support in their coping behavior which can be found in stress-management intervention. Since the globalized world makes increasing use of mobile devices like smartphones to monitor their lifestyle, the society demands technical support in this situation, namely a mobile application for stress-management concerning young people who cope proactively. To persuade people to use an intervention, this research discusses different persuasive system design principles. These are self-monitoring, cooperation and social comparison. They are all separately linked to stress as well as to proactive coping behavior. Conclusively, this research aims to answer the question whether there is a relationship between proactive stress coping and people's acceptance of particular persuasive system design features.

Methods: This study uses a cross-sectional online survey. To visualize the relevant persuasive system design features storyboards that presents the interaction between the user and the stress-management application, were used. Respondents were recruited by a heterogenous convenience sampling. The study sample consists of adult university students with sufficient mastery of the English language to fill out the questionnaire. Each participant needed to respond to each item of the questionnaire. Besides questions regarding demographic factors of the participants, the perceived acceptability scale was used to measure respondents' acceptance of the three studied persuasive system design principles presented in one of the storyboards, respectively. Moreover, the questionnaire contains the Perceived Stress Scale (PSS) and the Proactive Coping Scale (PCS). A correlation analysis was conducted through Spearman's rho.

Results: The study sample indicated a moderate stress level, however, compared to the norm of the relevant age group, the stress score was sub-standardly low. Further, the sample has a relatively high mean score on a proactive coping scale, meaning that they tend to cope with stress in a proactive manner. A significant relationship is found between the perceived acceptability of a stress-management application including the self-monitoring principle and people's engagement in proactive coping strategies ($r = 0.230$, $p < 0.05$, $N = 95$). Contrarily, there is no significant correlation between proactive coping and cooperation or between proactive coping and social comparison. Besides, the analysis points out that the acceptance

for social comparison was the lowest ($M = 3.0$, $SD = 1.3$). Thus, social comparison was the least accepted persuasive principle among young people who cope proactively.

Conclusion: This study points out that individuals using proactive stress-coping strategies are likely to accept stress-management mobile applications that include self-monitoring features. Contrarily, such individuals tend to not accept stress-management mobile applications which use the principles of cooperation or social comparison. According to prior research, all three studied principles are found to have a positive effect on stress-coping skills in the general population. Therefore, it is advisable to integrate different persuasive principles in applications for proactive individuals than in such for non-proactive ones. Since non-proactive individuals are less likely to approach and deal with a problematic situation than proactive individuals, future interventions should focus on helping non-proactive individuals to improve their stress-management skills. Hence, future research should examine persuasive principles in stress-management among people using non-proactive coping styles.

Keywords: stress management, e-health, proactive coping, persuasive system design, self-monitoring, cooperation, social comparison

Introduction

Being in need to catch the bus to work, getting all the work done, perhaps improving the performance at work which might lead to new promotion opportunities, being better than the colleagues, establishing close relationships, housekeeping and planning the future – our lives can be very demanding and stressful.

Nowadays, the experience of stress is a widespread problem in the modern world. For instance, according to the Global Organization of Stress, 75 percent of the American population reports moderate to high stress levels (Hull, 2020). Further, the website of The Recovery Village states that stress impacts the physical health of 77 percent and the mental health of 73 percent Americans (Hull, 2020). As a consequence of stress, 3.5 percent of US-American adults develop a post-traumatic stress disorder (Hull, 2020). However, there are different types of stress, different kinds of reactions and thus, individual differences in stress-related health issues. According to Fink (2016) stress has a different meaning for different people under different conditions. Consequently, to find effective ways to deal with stress and to create appropriate treatment for this rising problem, it is necessary to understand the concept of stress and find common ground in the experience of and reaction to stress.

The Concept of Stress

The perception of stress is individually different and highly personal (Fink, 2016). However, there is some common ground for the experience of stress. In general, it can be defined as the “response of the body to any demand” (Fink, 2016). This makes stress to a condition in which a person feels anxious due to a challenge that seems uncontrollably aversive (Fink, 2016). As experiencing this condition is called stress, the stimuli that triggers this experience is called stressor (Griffin & Clarke, 2010). Hence, a stressor can be a threat that is either perceived by or, indeed, put to an individual (Seyle, 1956). A stressor can symbolize a threat within different fields; it can mean harm to the individual in terms of health and wellbeing, his/her quality of life or overall functioning.

Concerning the kind of stress, a distinction needs to be made between two different types: distress and eustress (Kozusznik, Rodríguez, & Peiró, 2015). While distress describes the appraisal of a stressor as the starting point of harm or threat (Lazarus, 1993), eustress refers to the appraisal of a stressor as a challenge or to the chance that someone feels confident about overcoming by effectively mobilizing and using coping resources (Simmons & Nelson, 2007). Therefore, distress is rather associated with negative emotions or expectations (Kozusznik, Rodríguez, & Peiró, 2015), and if experienced as a persistent

period, it can cause a variety of diseases or health problems (Seyle, 1956). Simultaneously, eustress is rather linked to positive emotions and feelings (Kozusznik, Rodríguez, & Peiró, 2015), and can serve as motivation when feeling challenged (Simmons & Nelson, 2007). Accordingly, stress can be associated with both, positive and negative things. For this purpose, Schneiderman, Ironson and Siegel (2005) state that stress, in any kind, influences a person's mood, behavior and health.

How the exposure to stress can affect a person varies from one individual to another. However, besides short-term symptoms like sweating, being breathless, sweating, feeling tired, depressed or anxious (Michie, 2002), stress can also affect an individual's physical, emotional, social and intellectual development if s/he faces returning periods of excessive stress (Hayes, Eddy, Hayes, & Eddy, 1985; Michie, 2002). Consequently, stress can result in negative effects on people's wellbeing, which puts particular importance on the opportunities on how to deal with stress effectively to avoid these issues.

Coping as a Stress Response

If possible harm towards one's wellbeing, personal development or the achievement of a certain goal is experienced an organism reacts with a stress response (Michie, 2002; Seyle, 1956). By doing so, the organism tries to protect itself from any possible damage. As people vary in their behavior, people tend to differ also in their reactions to stress. Thus, different individuals inhibit different stress responses, even if they would face the same situation (Schneiderman, Ironson, & Siegel, 2005). However, at an individual level, people tend to stick with one kind of stress response independent of the stressor. This tendency of a person to react in the same pattern on and on is called "response stereotype" (Schneiderman, Ironson, & Siegel, 2005). In short, not everyone reacts to stress the same way, but an individual's reactions to different stressors might be similar.

In order to understand the differences in people's stress responses, it is necessary to define the construct of coping. According to Lazarus and Folkman (1984), it is a process that is aimed at by an action. Further, it seeks to remove an experienced imbalance between rising demands and excising capacities (Krohne, 1986). Thus, coping can be the dealing with and the reaction to a stressful situation. When being confronted with a stressor, individuals can rely on their coping resources which are personal or social characteristics that can help people to effectively deal with a stressor (Peralin & Schooler, 1978). Resources that can help to cope with stress-related harm are, for instance, an individual's sense of control or mastery over life, his level of self-esteem or one's social support (Gore, 1985; Schneiderman, Ironson, Siegel,

2005). Based on these resources, people choose their so-called coping strategies (Thoits, 1995).

There are two kinds of coping strategies: 1) problem-focused strategies, and 2) emotion-focused strategies. The first type of strategies focuses at actively managing or altering the demands themselves, whereas the latter one refers to rather passive efforts directed at the emotional reactions that often go along with the occurring requirements (Folkman & Lazarus, 1980). Furthermore, the article of Verešová and Malá (2012) points out a particular subcategory of the active kind of coping behavior, the so-called proactive coping which focusses on future situations and one's internal capacities in order to deal with stressors (Verešová and Malá, 2012). In general, people tend to show habitual preferences concerning approaching problems. For instance, there are preferences for being active and preferences for remaining passive. These preferences are so-called coping styles (Menaghan, 1983). However, when experiencing major life events or ongoing stressful periods, the majority of people uses multiple tactics of both problem-focused as well as emotion-focused coping (Folkman & Lazarus, 1980).

Stress-Management Interventions and Technological Possibilities

To support people in coping with stress, there is a rising amount of interventions aiming at enhancing users' stress-management skills. In a paper of Keogh, Bond and Flaxman (2006) interventions creating change in cognition and behavior are referred to as cognitive-behavior therapies. These interventions can focus on, for instance, enhancing management skills in the context of study performance and test anxiety among university students (Algaze, 1995; Vagg & Papsdorf, 1995). As such an intervention can consist of training sessions. Thus, a time schedule that needs to be appropriate for each participant may be a limitation. This means that participants who do not attend the training sessions cannot practice their new skills and thus, are not able to truly benefit from this intervention (Zeidner, 1998). Nevertheless, most existing stress-management interventions are found to have a positive effect on participants' performance as well as their mental health (Keogh, Bond, & Flaxman, 2006).

Importantly, these interventions seem more effective when cognitive-behavior techniques like relaxation or problem-solving were implemented (Keogh, Bond, & Flaxman, 2006). In accordance, the research of Abraham and Michie (2008) adds the fact that the efficiency of health-management related interventions is linked to a variety of so-called behavior change techniques. Such behavior change techniques can refer to goal setting or self-monitoring, as well as to making use of social support (Abraham & Michie, 2008).

In particular, in a study of Karppinen et al. (2016), the principle of self-monitoring is described as observing and tracing one's behavior, commonly in the area of health-related behavior. Regarding stress-management interventions, self-management and self-monitoring behavior are linked to effective stress-reducing and health-promoting strategies (Ramanathan, Swendeman, Comulada, Estrin, & Rotheram-Borus, 2013). Next to self-monitoring, social support techniques like cooperation and social comparison have been studied in relation to stress. Within the work field, for instance, cooperating with colleagues seem to help reducing stress at work (Zeffane & McLoughlin, 2006). Hence, a stress-management intervention should make use of this positive effect of cooperation on people's stress perception. Additionally, social cooperation was associated with a reduction in stress perception in the context of burnout (Buunk & Schaufeli, 1993). Accordingly, the inclusion of social cooperation in a stress-management intervention may be beneficial, too. Nonetheless, existing interventions with in-person training sessions likely lack effectivity for participant who cannot or do not want to leave their home for receiving help. Therefore, Zhao, Freeman and Li (2016) claim that behavioral change interventions are most effective when delivered in terms of online applications.

As the internet develops, people increasingly create and use new technologies in all areas of their lives. The technology that is used to provide health-related information, as well as to facilitate (the access to) health services refers to the term of eHealth (van Gemert-Pijnen, Kelders, Kip, & Sanderman, 2018). Consequently, in terms of stress-management, eHealth provides the framework that add all the available technological advantageous to stress-management intervention. This can be seen in a paper of Oinas-Kukkonen (2013). The author stresses that to improve people's health-related behavior, such stress management interventions using mobile devices provide higher chances of behavioral change in the intervention's targets.

However, Halko and Kientz (2010) argue that the common one-size-fits all approach might not be suitable in any case. When it comes to the needs of users of health-promoting applications, the individual differences need to be addressed separately. Such specialized technological tools require a high level of tailoring as well as a range of persuasive features in order to catch each user at his/her individual motivational level (Halko & Kientz, 2010). This means that a technological tool can only be effective and used when it is tailored and persuasive.

As a result, the researchers Oinas-Kukkonen and Harjumaa (2009) proposes a model which defines these features that make a design persuasive. This is called the Persuasive

System Design (PSD) model. According to Simons et al. (2001), persuasion refers to a kind of human communication that aims to change other people's judgments and actions. Thus, persuasive systems are aimed at reinforcing, changing or shaping behaviors and attitudes using of computerized software or information systems (Oinas-Kukkonen & Harjumaa, 2008).

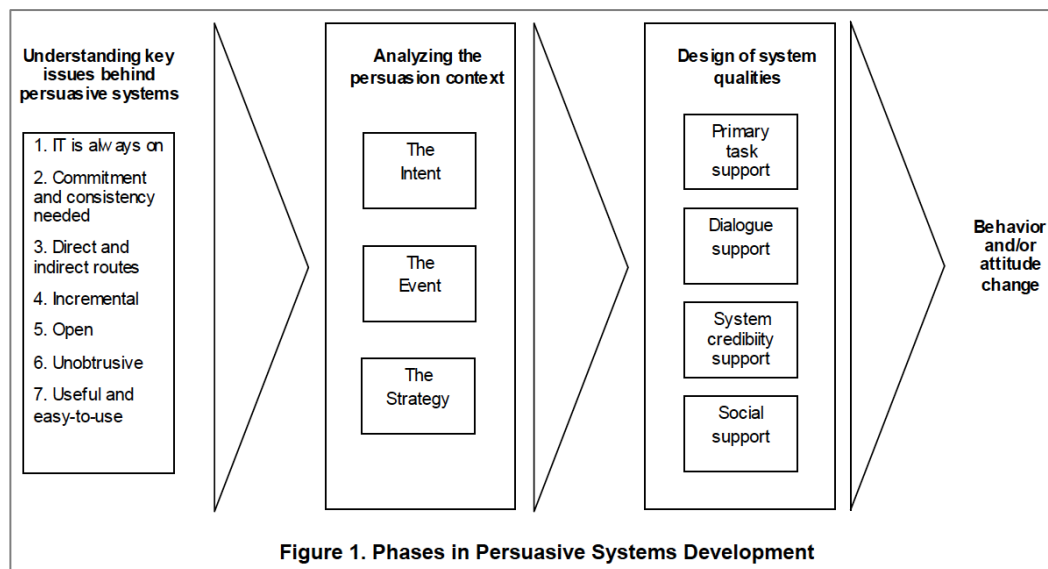


Figure 1. Phases in Persuasive System Development.

As depicted in Figure 1, the PSD model consists of three steps that need to be taken when aiming at behavior or attitude change. The steps build on each other; thus, only after gaining a real understanding of the issues and analyzing the context within the first two phases, one can design a system within the third phase. The third step of the persuasive system design refers to the design of system qualities. It contains four categories for persuasive system principles that are: a) primary task, b) dialogue, c) system credibility and d) social support. The primary task category includes, among others, the following principles: tailoring, personalization and self-monitoring (Oinas-Kukkonen & Harjumaa, 2009). The second category lists principles like similarity, liking, or social role, while the category of social support includes principles like social comparison and cooperation (Oinas-Kukkonen & Harjumaa, 2009). Since some of these persuasive principles are found to have a positive influence on stress-management interventions it seems to be useful to examine people's acceptability for particular persuasive system design principle in the context of stress-management mobile interventions.

Research Aim and Hypotheses

This study aims to answer the question whether there is a relationship between people's engagement in proactive coping strategies and their acceptance of the persuasive system design principles of self-monitoring, cooperation or social comparison, respectively, within stress-management mobile applications.

While the concept of self-monitoring is likely linked to one's sense of control over life and life quality, proactive coping strategies aim to have high control over their lives (Greenglass, 2002), which indicate an overlap in needs of people who prefer self-monitoring and people who cope proactively. Moreover, proactive coping behavior refers to a self-regulatory goal attainment process that requires self-determined goal setting and ambition for reaching the set goals (Greenglass et al., 1999). Since both self-monitoring and proactive coping refer to similar needs like having control of and regulating one's life, there is likely to be a link between these two constructs. Thus, individuals who use the one construct may be likely to use the other, as well. As a consequence, the first hypothesis claims a positive correlation between self-monitoring and proactive coping.

H1: There is a positive correlation between people's use of proactive coping behavior and their acceptance for a stress management mobile application that includes the persuasive system design principle of self-monitoring.

Since proactive individuals tend to own excellent social skills that can be used to access resources (Veresová & Malá, 2012), principles referring to social support should be investigated in relation to proactive coping, as well. Research shows that social support can figure as a coping assistance (Thoits, 1986). Like proactive coping is linked to goal setting, it involves resources for self-improvement which includes the concept of social support (Greenglass & Fiksenbaum, 2009). According to Wills (1990), this association can be explained by the fact that having close relationships to others can support one's stress coping behavior by means of meeting a person's need with sharing the same concerns, being enabled to disclose to a person or receiving an advice. Thus, it would be interesting to measure the perceived acceptability of stress management mobile application, including persuasion features that refer to social support. Consequently, the second and third hypotheses focus on the relationship between proactive coping and the perceived acceptability of an application which implements the persuasive system design principle of social comparison or cooperation, respectively.

H2: There is a positive correlation between people's use of proactive coping behavior and their acceptance for a stress management mobile application that includes the persuasive system design principle of cooperation.

H3: There is a positive correlation between people's use of proactive coping behavior and their acceptance for a stress management mobile application that includes the persuasive system design principle of social comparison.

Method

Design

A cross-sectional online survey design was used to examine the relationship between people's acceptance of particular persuasive system design features and their coping style. Therefore, the online survey includes several storyboards which represent a user's interaction with a stress management application, including one of the three relevant persuasive system design principles, namely, self-monitoring, cooperation and social comparison.

Participants

Since this study focuses on the perceived acceptability of stress management application in young adults, the main inclusion criterium was that all participants needed to be equal to or above 18 years, thus being an adult. Further, the sample was specified on university students since they are expected to experience stress, and this condition is needed to relate to a stress management application. Additionally, all participants were expected to have sufficient mastery of the English language to be able to fill out the questionnaire.

According to a prior sample size calculation, the aimed number of participants was $N = 84$ to assess a medium effect with a statistical power of .8. The sample was created by non-random sampling. In particular, it was a heterogenous convenience sampling whereby participants were recruited by asking for their help on social media platforms like Instagram or WhatsApp as well as using the system of the University of Twente.

Materials

The primary material was an online questionnaire which contains questions about the participants' demographic factors, such as age, gender, and nationality (e.g. What is your nationality?), the depiction of three storyboards in combination three test scales of perceived acceptability, proactive coping and perceived stress.

Storyboards

There were three different storyboards, each displaying one of the three relevant persuasive system design principles, self-monitoring, cooperation and social comparison. The method of storyboards is best to use because participants can understand the nature of a certain application more easily by visual representations than by written description and imagination. The studied storyboards are shown in Figure 2, Figure 3, and Figure 4. All three storyboards were created by the researcher based persuasive system design derived from the model of Kukkonen (Oinas-Kukkonen & Harjumaa, 2009). Moreover, the storyboards provided by Christian Wrede served as inspiration for the creation process. In this study, the three relevant principles of the persuasive system design model (self-monitoring, cooperation and social comparison) are depicted, respectively, in the presented storyboards.

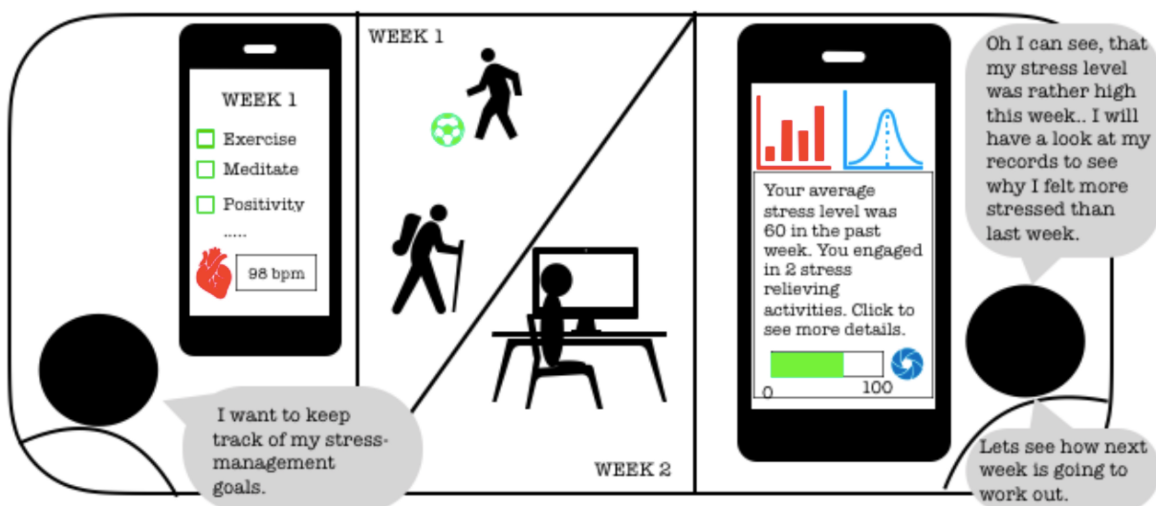


Figure 2. Storyboard “self-monitoring” showing an interaction with a stress management app using the persuasive system design feature of self-monitoring.



Figure 3. Storyboard “cooperation” showing an interaction with a stress management app using the persuasive system design principle of cooperation.

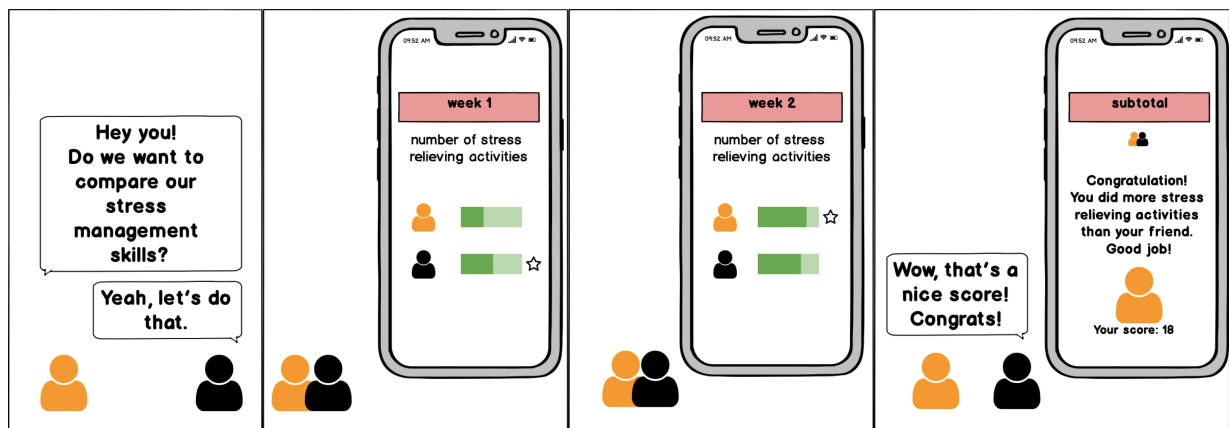


Figure 4. Storyboard “social comparison” showing an interaction with a stress management app using the persuasive system design principle of social comparison.

Perceived Acceptability Scale

The Perceived Acceptability Scale (PAS) was used to measure how participants perceive that persuasiveness of the displayed storyboards. The scale consists of seven items, six of which refers to aspects of perceived acceptability (perceived enjoyment, likelihood of use, helpfulness, quality of life, ease of use, time saving) and one of which figured as an option to give a general comment in a text field. The first six items were ranked on a 7-point Likert scale ranging from 1 = “strongly disagree” to 7 = “strongly disagree”. An example of these items is: “This technology is something that I would enjoy using”. The reliability measurement of Cronbach’s alpha conducted for the PAS used for the acceptance of self-monitoring, cooperation and social comparison ($\alpha = .9$, respectively) refers to a high internal consistency.

Perceived Stress Scale

Further, the online survey contains another scale the Perceived Stress Scale (PSS). The PSS consists of 10 items and is based on the PSS version of Cohen, Kamarck and Mermelstein (1983) that assesses a person's stress level concerning unpredictable and challenging situations in his/her life during the last month. An example item of this scale is "In the last month, how often have you felt nervous and "stressed?". The 10 items are measured with a 5-point Likert scale with 1 = "never", 2 = "almost never", 3 = "sometimes", 4 = "fairly often", and 5 = "very often". Thus, a high score on the PSS refers to a high level of perceived stress. To get a valid score that can range from 10 to 50, all reversed items need to be recoded and total scores are conducted. As assessed with Cronbach's Alpha, the reliability of the PSS is $\alpha = .9$, meaning a high internal consistency.

Proactive Coping Scale

Lastly, a subscale of the Proactive Coping Inventory (PCI) of Greenglass (1998), the Proactive Coping Scale (PCS) was used. The PCS is a unidimensional scale that includes 14 homogenous items. To cover different aspects of proactive coping behavior, it measures autonomous goal setting with self-regulatory goal attainment (Greenglass, Schwarzer, Jakubiec, Fiksenbaum, & Taubert, 1999). All items (e.g. "I am a "take charge" person.") were measured with a 4-point Likert scale with 1 = "not at all", 2 = "barely true", 3 = "somewhat agree" and 4 = "completely true". Consequently, a high score of the PCS means a great engagement in proactive coping behavior while a low a low PCS score refers to rather non-proactive coping behavior. The reliability measures of this scale ($\alpha = .8$) indicate good internal consistency. Furthermore, the scale exhibits good item-total correlations and sufficient factorial validity and homogeneity (Greenglass et al., 1999).

Procedure

The data collection of this study started at the 1st of April and lasted until the 24th of April. The participants reached the questionnaire via the website of Qualtrics or Sona System. By taking part in this study via the website of Sona System, the students got 0.25 credits for their efforts. For all the participants that entered the questionnaire via Qualtrics, there was no offered reward but the researcher's gratitude. They participated completely voluntarily. To access, every participant needed a laptop or computer, or a smartphone with a working internet connection. After entering the questionnaire, each participant needed to sign digitally

an informed consent that gives a short overview of the topic of the study and its expenditure of time. It further informed the participant about their right to quick their participation at any time without giving a reason. Thereby, the researcher made sure to meet the ethical guidelines that are bound to the ethical approval that was given by the faculty of Behavioral Science Ethics Committee of the University of Twente. Only by accepting this consent, the participant is allowed to proceed to the actual survey. Then, all participants received the same instructions and went through the same procedure.

First of all, the questionnaire asks for demographic information about each participant, such as age, nationality and gender. Afterwards, the concept of storyboards is explained. Each of the three storyboards were presented to the respondent and followed by the PAS that refers to the respective persuasive principle shown in the storyboard. Here, the participant is supposed to respond to the six items of the Perceived Acceptability Scale in order to measure his or her acceptance of the respective persuasive principle included in the particular storyboard. After responding to all three storyboards, all participants were asked to respond to two other scales: the Perceived Stress Scale, and the Proactive Coping Scale. In the end, all participants were thanked for their participation.

Data Analysis

To analyze the data gathered by the survey, the software of IBM SPSS Statistics (version 25) is used. To prepare the data set, those respondents who do not meet the inclusion criteria needs to be excluded. These inclusion criteria consist of being a university student, being equal or above 18 years old, having sufficient mastery of the English language and the completion of the whole questionnaire. Since some respondents dropped out during the questionnaire, they did not answer all items. Consequently, using this incomplete data could falsify the following data analysis. Hence, data exclusion needs to be done for non-university students ($n = 3$) and incomplete data ($n = 62$). This leaves a dataset with 95 valid responses out of 160 initially collected responses.

First of all, descriptive statics were used to summarize the social demographic characteristics of the study sample (age, gender, nationality). Further, a preliminary test for normality was used to check for normal distribution. As assessed by the Shapiro-Wilk test, none of the three persuasive principles, self-monitoring, cooperation and social comparison, had a normal distribution ($p < .05$). Therefore, Spearman's rho is used to investigate the correlation between proactive coping behavior and the perceived acceptance of the three respective persuasive principles. Hence, this assessment tool tests the relationship of proactive

coping and the perceived acceptance towards the storyboard. First, the storyboard includes the principle of self-monitoring, then, the principle of social comparison, and lastly, the principle of cooperation. Therewith, Spearman's rho is conducted for the acceptance of each persuasive principle in relation to proactive coping.

Results

As shown in Table 1, the final sample consists of mostly German respondents with an mean age of 22 (SD = 1.9) and a high proportion of women. The stress score is slightly above the scale's median. It is noteworthy that the mean stress score of 2.9 (SD = .6) is slightly below the median of a scale ranging from 1 to 5. This means that the studied sample is slightly to moderately stressed. However, when comparing this mean with the norm of the relevant age group of 18-29 with a mean score of 4.2 (.6) the study sample is sub-standardly low in its stress level (Cohen, Kamarck, & Mermelstein, 1994). Further, a mean proactive coping score of 3.1 (SD = .4) on a scale ranging from 1 to 4 implies that the study sample tends to cope more proactively than non-proactively.

Table 1. Demographic characteristics of the sample.

	Sample N = 95	
Gender, N (%)		
female	62	(65)
male	33	(35)
Mean Age in years (SD)	22.1	(1.9)
Nationality, N (%)		
German	85	(90)
Dutch	3	(3)
other	7	(7)
Mean PSS¹ (SD)	2.9	(.6)
Mean PCS² (SD)	3.1	(.4)

¹ PSS: Perceived Stress Scale

² PCS: Proactive Coping Scale

Further, Table 2 presents the mean scores of people's perceived acceptability for the three relevant persuasive principles. The mean scores of the perceived acceptability for self-monitoring and cooperation are above average, namely above 4 within a possible range of 1 to 7. Contrarily, the one for social comparison lies below the median of 3.5. This indicates that

there is a moderate acceptance of the persuasive strategies self-monitoring and cooperation but a low acceptance of the principles of social comparison. It needs to be noted that self-monitoring is the most accepted persuasive system design principle.

Regarding these mean scores, it can be said that the inclusion of the self-monitoring principle is the most accepted by the respondents, followed by the cooperation principle. Therefore, these two principles are said to improve people's acceptance for a stress-management mobile application. On the contrary, social comparison is rather unaccepted than accepted, meaning that the implementation of this principle has a negative influence on people's acceptance of the intervention.

Table 2. Mean scores of perceived acceptability of the different PSD principles.

Type of persuasive strategy	PAS ¹ Mean (SD)
Self-Monitoring	4.7 (1.4)
Cooperation	4.4 (1.3)
Social Comparison	3.0 (1.3)

¹Perceived Acceptability Scale

In order to look for correlations between people's acceptance of persuasive features included in a stress management app and their coping style, Spearman's rho was used. Table 3 shows the Spearman correlation between the perceived acceptability scores of the three different persuasive strategies and the proactive coping score. Regarding the principle of self-monitoring, there is a significant correlation between proactive coping behavior and the mean score of perceived acceptability ($r = 0.230$, $p < 0.05$, $N = 95$). This means that the higher an individual scores in proactive coping behavior the more likely he/she is to accept stress-management mobile applications that include a self-monitoring feature. Hence, the more proactive one copes, the likelier s/he is to prefer the inclusion of self-monitoring.

When looking on the item level, the items of "enjoyment", "likelihood of use" and "time saving" are the ones showing a significantly positive effect ($r = 0.282$, $p < 0.001$; $r = .277$, $p < .001$; $r = .202$, $p < .05$). According to Cohen (1992), this is a weak to moderate effect. Therefore, proactive coping significantly correlates with the items of "enjoyment", "likelihood of use" and "time saving", and thus, there is also a significantly positive correlation between proactive coping behavior and perceived acceptability of self-monitoring as a whole. Consequently, people who cope proactively tend to prefer self-monitoring as a

principle in stress interventions; however, these people especially like its concept of enjoyment, likelihood of use and saving time. In contrast to self-monitoring, the correlation analysis for cooperation and social comparison indicates that there is no significant correlation between proactive coping scores and the perceived acceptability for cooperation or social comparison.

Table 3. Correlations between perceived acceptability and proactive coping.

Persuasion type	Perceived acceptability	Spearman's rho	P
Self-Monitoring		.230**	.025
	1. enjoyment	.282**	.006
	2. likelihood of use	.277**	.007
	3. helpfulness	.197	.055
	4. quality of life	.167	.105
	5. ease of use	.084	.418
	6. time saving	.202*	.049
Cooperation		.090	.383
Social Comparison		.113	.277

** . Correlation is significant at the .01 level (2-tailed).

* . Correlation is significant at the .05 level (2-tailed).

Discussion

This research was aimed to investigate the relationship between people's tendency to engage in proactive stress-coping behavior and their perceived acceptability of stress-management mobile application that includes one of the following persuasive principles: self-monitoring, social comparison and cooperation. The hypotheses of this paper claim that there is a positive correlation between the proactive coping behavior and the perceived acceptability for each of the three persuasive strategies, respectively. In the analysis, it was shown that there is a positive significant correlation between one's perceived acceptability of the self-monitoring principle and engaging in proactive coping behavior. This result confirms the first hypothesis. By contrast, there is no significant correlation for cooperation and social comparison with proactive coping behavior. Consequently, the second and third hypothesis needs to be rejected. Hence, the research question is partly proven and partly rejected.

There is found to be a relationship between proactive coping behavior and the acceptance of one persuasive system design principle, namely self-monitoring, but this relationship was not found for two of the other principles. These findings indicate that people who prefer to cope with stress in a proactively manner and, thus, tend to focus on self-regulatory goal attainment, are more likely to accept a stress-management app if its design includes features of self-monitoring. These findings fit in line with prior research. For instance, the research of Thoolen, Ridder, Bensing, Gorter and Rutten (2009) in which a self-management intervention was applied to chronic diabetes patients, shows that there is a positive association between proactive competence and self-management. In that study, proactive coping was linked to developing self-management behavior and self-management was said to include self-monitoring. As a result, self-monitoring could be enhanced by improving people's proactive coping competence (Thoolen et al., 2009).

In contrast to self-monitoring, the analysis of perceived acceptability of cooperation shows no significant correlation with proactive coping. Thus, there is no evidence that people who cope proactively are more likely to accept a stress-management application that includes the principle of cooperation.

Contradictory to these findings, Wills (1990) explains that stress-coping behavior can be improved by having close relationships and sharing the same issue or task. Accordingly, there seem to be a positive effect of having peers who work on the same task and thus, the opportunity to cooperate with each other. This relation is represented in the mean value of perceived acceptability for cooperation which is almost as high as the one for self-monitoring. This means that there is a relatively high acceptance of the cooperation feature among the participants.

However, in contrast to other studies, this research examines the acceptability of the persuasive system design principles with regard to the engagement in proactive coping strategies. The analysis shows that there is no significant correlation between the acceptance this principle and proactive coping behavior. Therefore, this study shows the inappropriateness of the cooperation principle for people who prefer proactive coping strategies. To conclude, there is found to be a positive effect of a cooperation feature on people's stress-coping behavior, in general. However, this is not the case for people using proactive coping strategies.

Concerning social comparison, there is no correlation found between the acceptability of this particular persuasive principle and proactive coping behavior. Further, the perceived acceptability mean score for social comparison is below average. Thus, the participants tend

to not accept the inclusion of this principle. Contrarily, prior research states that there is a positive impact of having close relationships with whom one can share the same issues on stress-coping (Wills,1990). Thus, similar to cooperation, there seem to be a positive effect of social comparison on coping skills. However, this effect was not found in this study. This discrepancy may be explained by the fact that current literature does not yield evidence for the positive effect of social comparison on stress-coping skills among proactive individuals. There is no distinction between various sub-populations with different coping strategies. Hence, it may be that people using proactive coping strategies simply do not like the idea of social comparison. Another possible explanation why the acceptance of this principle was low may be a misinterpretation of the storyboard that represented the social comparison. Thus, it would be useful to test whether this principle was correctly understood by the participants.

To conclude, this research points out that proactive individuals tend to rather focus on their behavior, goals and progress, than to strive for common goals with a partner. Therefore, a stress-management application for users who cope proactively should focus on their individual goals and progress instead of making them dependent on others. Further, this study shows that the inclusion of social support principles like cooperation or social comparison is not beneficial for people coping proactively. Nonetheless, prior studies found a positive impact of these principles in the general population, thus, it is necessary to examine what sub-population can benefit most and what sub-group do not benefit from the inclusion of such principles. Unfortunately, there is a lack of literature about the acceptability of the social support principles among people using other coping strategies than the proactive one.

Strengths, Limitations, and Recommendations

Strengths

As the population size of 95 participants was higher than the required sample size, the assessment had sufficient statistical power to find significant results. Moreover, this research was focused on a particular area and thus, was highly specialized. This is why the significant relationship between self-monitoring and proactive coping is a result of a small area but with detailed insight. Through this, it became clear that people who tend to use proactive coping strategies have a high need for support in their self-monitoring behavior but do not like features that made them depended on others.

Limitations

While each storyboard focused on one specific principle, there may be other PSD principles that are not intentionally but maybe accidentally included. For instance, the storyboard for social comparison and cooperation contain a positive response in the end ('Nice. Good job.'/'Congrats.') that can be interpreted as praise. In consequence, these storyboards might also include the PSD principle of praise in addition to their initial principle. Hence, this hidden principle might have an unexpected effect on the respondents' acceptability for the initially tested principle.

Moreover, special consideration deserves the overall circumstances that were present when conducting this study, namely, the circumstance of the pandemic called COVID-19. This particular situation may have taken a great deal of our autonomy and leaves us uncertain, helpless and powerless. Obviously, these feelings put a threat to our mental health, especially for people aiming at independency and being in charge. Therefore, people might have not felt capable of coping as proactively as usual since the perceived control of their lives may vanish. To conclude, this situation could counteract with people's preference for proactive coping since proactive coping refers to being independent, striving for setting goals and being in charge of one's own life. These are things that may be hindered by the pandemic. That being said, the proactive coping scale may be falsified. In consequence, the measurements that were conducted based on these scores might be distorted. This potential change in coping behavior needs to be taken into account when interpreting the results of this research.

Another limitation concerns the material. As the survey was published in English individuals from different populations without an excellent mastery of the English Language were directly excluded. That highly narrowed the recruitment for participants. Besides, an insufficient mastery of the English language might be a reason why so many of the participants drop out during the survey.

Recommendations

First of all, one recommendation is to translate the measurement material, the survey, into multiple languages. In that way, individuals from different populations without an excellent mastery of the English Language can take part, as well. Then, the sample may include more respondents and fewer dropouts. With increasing participants' understanding, they are likely to show more participation and give more accurate answers.

Another recommendation would be to perform a pilot test before starting the data collection. In this research, it was left out. However, including a pilot test could have improved the quality of the measurement tool.

Future studies & Conclusion

For future research, this paper proposes redoing this study with different storyboards which at best do not consist of multiple persuasive system design principles. The study design can be kept as the storyboards serve as a good tool to depict the particular user-technology interaction. However, the storyboards need to be very concrete, tailoring only one specific persuasive principle. Moreover, further research is necessary to assess the role of social support in non-proactive individuals. Research suggested that there is an association between social support and stress-management (Wills, 1990). Against expectations, this was disproved by these study outcomes. Therefore, future research should investigate whether social support principles like cooperation and social comparison have a positive impact on stress-management skills in a non-proactively coping sample.

When turning to stress-management interventions or coping support programs, this study reveals the advice to include the self-monitoring principle for proactive users within the design of such new interventions. If a user of a future stress-management application turns out to be high in proactive coping his/her system design needs to include self-monitoring features to increase the likelihood that this user accepts and uses the app. Therefore, a personal coping test needs to be conducted for each user that enters the application for the first time. Based on that outcome, the system design should be composed of the principles which are relevant for his/her coping style. For all users who tend to engage in proactive coping strategies, it is advised to include self-monitoring and self-management support features.

Moreover, future research should focus on the effectiveness of including self-monitoring features in stress-management application for individuals who cope proactively. This study found a high acceptability of self-monitoring and a positive correlation with proactive coping. However, it should be assessed how effective a stress-management application including this principle would be.

Additionally, proactive individuals prefer to focus on their own progress; thus, it became clear that a stress-management application for proactive users should not include features which make the user dependent on someone else. Hence, it can be derived that stress-management interventions tailored to proactive people should rather not use cooperation or social comparison techniques. Nevertheless, such persuasive principles may still be beneficial

for other users of stress-management applications. Since proactive individual prefer to approach stressors, non-proactive individual who tend to withdraw may be more vulnerable to stress. Consequently, it is important to find out what sub-population with what kind of coping preferences could benefit from such principles. Hence, stress-management mobile applications are most accepted if they include the relevant persuasive principles for different groups of users sorted according to their particular coping strategies.

To sum up, this study has a determinate focus that narrows the study's impact on a minimal area. However, these findings can contribute to society as they can help creators of stress-management applications who often focus on the technical elements, to take into account the perspective of the user as well. The study's findings may only affect a relatively small population, namely proactive individuals using a stress-management application. However, these people can benefit from these new insights if application developers implement the recommendation derived from this research and include self-monitoring features in their design. In conclusion, this research reveals that the inclusion of the self-monitoring principle has an impact on people's acceptance of a stress-management mobile application. This impact, however, is bound to the population of proactive coping people. Thus, further investigation in the relationship between other non-proactive coping styles and the perceived acceptability of persuasive strategies included in a stress-management application seems to be very valuable.

References

- Abraham, C., & Michie, S. (2008). A taxonomy of behavior change techniques used in interventions. *Health psychology, 27*(3), 379. doi:10.1037/0278-6133.27.3.379
- Buunk, B. P., & Schaufeli, W. B. (1993). Burnout: A perspective from social comparison theory. *Professional burnout: Recent developments in theory and research*, 53-69. Retrieved from <https://www.wilmarschaufeli.nl/publications/Schaufeli/039.pdf>
- Cohen, S., Kamarck, T., & Mermelstein, R. (1994). Perceived stress scale. *Measuring stress: A guide for health and social scientists*, 10, 1-2. Retrieved from <https://www.northottawawellnessfoundation.org/wp-content/uploads/2018/04/PerceivedStressScale.pdf>
- Fink, G. (2016). Stress, definitions, mechanisms, and effects outlined: lessons from anxiety. In *Stress: Concepts, cognition, emotion, and behavior* (pp. 3-11). Academic Press. doi:10.1016/B978-0-12-800951-2.00001-7
- Folkman, S., & Lazarus, R. S. (1980). An analysis of coping in a middle-aged community sample. *Journal of health and social behavior*, 219-239. doi:10.2307/2136617
- Folkman, S., & Lazarus, R. S. (1984). Stress, appraisal, and coping (pp. 150-153). New York: Springer Publishing Company. Retrieved from <https://ccme.osu.edu/WebCastsFiles/562The%20Management%20of%20Stress%20-%202.pdf>
- Gore, S. (1985). Social support and styles of coping with stress. In S. Cohen & S. L. Syme (Eds.), *Social support and health* (p. 263-278). Academic Press. Retrieved from <https://search-ebscohost-com.ezproxy2.utwente.nl/login.aspx?direct=true&db=psyh&AN=1985-97489-013&site=ehost-live>
- Greenglass, E. R. (2002). Proactive coping and quality of life management. In E. Frydenberg (Ed.), *Beyond coping: Meeting goals, visions, and challenges* (p. 37-62). Oxford University Press. doi:10.1093/med:psych/9780198508144.003.0003
- Greenglass, E. R., & Fiksenbaum, L. (2009). Proactive coping, positive affect, and wellbeing: Testing for mediation using path analysis. *European psychologist, 14*(1), 29-39. doi:10.1027/1016-9040.14.1.29

- Greenglass, E., Schwarzer, R., Jakubiec, D., Fiksenbaum, L., & Taubert, S. (1999, July). The proactive coping inventory (PCI): A multidimensional research instrument. In 20th International Conference of the Stress and Anxiety Research Society (STAR), Cracow, Poland (Vol. 12, p. 14). Retrieved from <https://pdfs.semanticscholar.org/f5ab/54d3d33f4fa8f96652b6d904967547c6b96d.pdf>
- Griffin, M. A., & Clarke, S. (2010). Stress and well-being at work. In S. Zedeck (Ed.), *APA handbook of industrial and organizational psychology* (Vol. 3, pp. 359–397). Washington, DC: American Psychological Association. doi.org/10.1037/12171-010
- Halko, S., & Kientz, J. A. (2010, June). Personality and persuasive technology: an exploratory study on health-promoting mobile applications. In *International conference of persuasive technology* (pp. 150-161). Springer, Berlin, Heidelberg. doi:10.1007/978-3-642-13226-1_16
- Hayes, D. M., Eddy, J. M., Hayes, D. M., & Eddy, J. M. (1985). Stress management education: A life skills approach for health promotion professionals. *Wellness Perspectives*, 2(4), 9-11. Retrieved from https://libres.uncg.edu/ir/uncg/f/J_Eddy_StressManagement_1985.pdf
- Hull, M. (2020, July 4). Stress Facts and Statistics. Retrieved from <https://www.therecoveryvillage.com/mental-health/stress/related/stress-statistics/>
- Karppinen, P., Oinas-Kukkonen, H., Alahäivälä, T., Jokelainen, T., Keränen, A. M., Salonurmi, T., & Savolainen, M. (2016). Persuasive user experiences of a health Behavior Change Support System: A 12-month study for prevention of metabolic syndrome. *International journal of medical informatics*, 96, 51-61. doi:10.1016/j.ijmedinf.2016.02.005
- Keogh, E., Bond, F. W., & Flaxman, P. E. (2006). Improving academic performance and mental health through a stress management intervention: Outcomes and mediators of change. *Behaviour research and therapy*, 44(3), 339-357. doi:10.1016/j.brat.2005.03.002
- Kozusznik, M. W., Rodríguez, I., & Peiró, J. M. (2015). Eustress and distress climates in teams: Patterns and outcomes. *International Journal of Stress Management*, 22(1), 1. doi:10.1037/a0038581
- Krohne, H. W. (1986). Coping with stress. In *Dynamics of stress* (pp. 207-232). Springer, Boston, MA. doi:10.1007/978-1-4684-5122-1_11

- Lazarus, R. S. (1993). From psychological stress to the emotions: A history of changing outlooks. *Annual Review of Psychology*, 44, 1–22.
doi:10.1146/annurev.ps.44.020193.000245
- Menaghan, E. G. (1983). Individual coping efforts: Moderators of the relationship between life stress and mental health outcomes. In *Psychosocial stress* (pp. 157-191). Academic Press.
- Michie, S. (2002). Causes and management of stress at work. *Occupational and environmental medicine*, 59(1), 67-72. doi:10.1136/oem.59.1.67
- Oinas-Kukkonen, H. (2013). A foundation for the study of behavior change support systems. *Personal and ubiquitous computing*, 17(6), 1223-1235. doi:10.1007/s00779-012-05915
- Oinas-Kukkonen, H., & Harjumaa, M. (2008, February). Towards deeper understanding of persuasion in software and information systems. In *First international conference on advances in computer-human interaction* (pp. 200-205). IEEE.
doi:10.1109/ACHI.2008.31
- Oinas-Kukkonen, H., & Harjumaa, M. (2009). Persuasive systems design: Key issues, process model, and system features. *Communications of the Association for Information Systems*, 24(1), 28. doi:10.17705/1CAIS.02428
- Pearlin, L. I., & Schooler, C. (1978). The structure of coping. *Journal of health and social behavior*, 2-21. doi:10.2307/2136319
- Ramanathan, N., Swendeman, D., Comulada, W. S., Estrin, D., & Rotheram-Borus, M. J. (2013). Identifying preferences for mobile health applications for self-monitoring and self management: focus group findings from HIV-positive persons and young mothers. *International journal of medical informatics*, 82(4), e38-e46.
doi:10.1016/j.ijmedinf.2012.05.009
- Schneiderman, N., Ironson, G., & Siegel, S. D. (2005). Stress and health: psychological, behavioral, and biological determinants. *Annu. Rev. Clin. Psychol.*, 1, 607-628.
doi:10.1146/annurev.clinpsy.1.102803.144141
- Selye, H. (1956). The stress of life. Retrieved from <http://www.repositorio.cenpat-conicet.gob.ar/bitstream/handle/123456789/415/theStressOfLife.pdf?sequence=1>
- Simmons, B. L., & Nelson, D. L. (2007). Eustress at work: Extending the holistic stress model. *Positive organizational behavior*, 40-53. doi:10.4135/9781446212752.n4

- Thoits, P. A. (1986). Social support as coping assistance. *Journal of consulting and clinical psychology*, 54(4), 416. doi:10.1037/0022-006X.54.4.416
- Thoits, P. A. (1995). Stress, coping, and social support processes: Where are we? What next?. *Journal of health and social behavior*, 53-79. doi:10.2307/2626957
- Thoolen, B. J., Ridder, D. D., Bensing, J., Gorter, K., & Rutten, G. (2009). Beyond good intentions: The role of proactive coping in achieving sustained behavioural change in the context of diabetes management. *Psychology and Health*, 24(3), 237-254. doi:10.1080/08870440701864504
- Van Gemert-Pijnen, L., Kelders, S. M., Kip, H., & Sanderman, R. (Eds.). (2018). *eHealth research, theory and development: a multi-disciplinary approach*. Routledge.
Retrieved from
[https://books.google.com/books?hl=en&lr=&id=lv1cDwAAQBAJ&oi=fnd&pg=PT9&dq=Van+Gemert-Pijnen,+L.,+Kelders,+S.+M.,+Kip,+H.,+%26+Sanderman,+R.+\(Eds.\).+\(2018\).+eHealth%09+research,+theory+and+development:+a+multi-disciplinary+approach.+Routledge.&ots=N0XI-v6Ry9&sig=U_YUAmZTFuFA_kSRXr1YmiK1Xho](https://books.google.com/books?hl=en&lr=&id=lv1cDwAAQBAJ&oi=fnd&pg=PT9&dq=Van+Gemert-Pijnen,+L.,+Kelders,+S.+M.,+Kip,+H.,+%26+Sanderman,+R.+(Eds.).+(2018).+eHealth%09+research,+theory+and+development:+a+multi-disciplinary+approach.+Routledge.&ots=N0XI-v6Ry9&sig=U_YUAmZTFuFA_kSRXr1YmiK1Xho)
- Wills, T. A. (1990). Stress and coping factors in the epidemiology of substance use. In *Research advances in alcohol and drug problems* (pp. 215-250). Springer, Boston, MA. doi:10.1007/978-1-4899-1669-3_7
- Verešová, M., & Malá, D. (2012). Stress, proactive coping and self-efficacy of teachers. *Procedia-Social and Behavioral Sciences*, 55, 294-300. doi:10.1016/j.sbspro.2012.09.506
- Zeffane R, McLoughlin D (2006) Cooperation and stress. *Manag Res News* 29(10):618–631. doi:10.1108/01409170610712326
- Zhao, J., Freeman, B., & Li, M. (2016). Can mobile phone apps influence people's health behavior change? An evidence review. *Journal of medical Internet research*, 18(11), e287. doi:10.2196/jmir.5692

Appendix A: Informal Consent



Dear respondent,

Thank you for participating in this study which is part of our bachelor thesis at the University of Twente. This study focuses on the persuasion of stress management mobile applications and how this is connected to sample features like personality traits, coping strategies or gender. It will take you about 10 minutes to complete this survey. Please answer the questions honestly; there are no right or wrong answers.

You are free to stop the survey at any point of time. Only completed surveys can be used for this research. Your data will be used anonymously and only for the purpose of this study. If you have any questions, feel free to contact us.

Thank you in advance!

Sophia, Judith and Kristina


contact address: j.senger@student.utwente.nl

I read and understood all the above mentioned and agreed to participate in the study. I partake out of my own free will and I am informed that I can withdraw from this study at any time without providing a reason.

☐ Yes

☐ No

Appendix B: The Online Survey



UNIVERSITY OF TWENTE.

The following questions ask about your demographic characteristics.

What is your age?

What is your gender?

☐ Male

☐ Female

☐ Other

What is your nationality?

☐ German

☐ Dutch

☐ Other

I am a ...



Next, we will show you seven different storyboards. These storyboards present graphic illustrations of a user and his/her interaction with a mobile app that aims to improve your stress management.

After each storyboard, you will be asked to indicate how much you agree or disagree with several statements.

Please read and inspect the storyboards clearly, before you rate the statements. Keep in mind that there are no right or wrong answers as we are interested in your personal opinion.

You just saw an interaction with a stress management application. Now, we want you to answer the following questions about your opinion regarding the system as honest as possible.

	Disagree strongly	Disagree moderately	Disagree a little	Neither agree nor disagree	Agree a little	Agree moderately	Agree strongly
This technology is something that I would enjoy using.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the future, this technology is something I would consider using.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
With regards to my own health goals, I consider this technology helpful.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
With regards to the quality of my life, I think this technology would improve the quality of my life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think this technology seems easy to use.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think this technology would help me save time in reaching my health goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

General comments.

Please describe any other comment or reaction to the technology depicted in the storyboard.

The questions in this scale ask you about your feelings and thoughts during the last month.

In

each case, you will be asked to indicate by clicking on how often you felt or thought a certain way.

	Never	Almost Never	Sometimes	Fairly Often	Very Often
In the last month, how often have you been upset because of something that happened unexpectedly?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last month, how often have you felt that you were unable to control the important things in your life?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
In the last month, how often have you felt nervous and "stressed"?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last month, how often have you felt confident about your ability to handle your personal problems?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last month, how often have you felt that things were going your way?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last month, how often have you found that you could not cope with all the things that you had to do?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last month, how often have you been able to control irritations in your life?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last month, how often have you felt that you were on top of things?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last month, how often have you been angered because of things that were outside of your control?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Further, we would like to know how you deal with difficult and challenging situations or obstacles. Please answer the following questions as honest as possible.

	not at all true	barely true	somewhat true	completely true
I am a "take charge" person.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I try to let things work out on their own.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
After attaining a goal, I look for another, more challenging one.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I like challenges and beating the odds.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I visualize my dreams and try to achieve them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Despite numerous setbacks, I usually succeed in getting what I want.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I try to pinpoint what I need to succeed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I always try to find a way to work around obstacles; nothing really stops me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I often see myself failing so I don't get my hopes up too high.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I apply for a position, I imagine myself filling it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I turn obstacles into positive experiences.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If someone tells me I can't do something, you can be sure I will do it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I experience a problem, I take the initiative in resolving it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I have a problem, I usually see myself in a no-win situation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Thank you for your time!

You have reached the end of this survey.

By participating in this study you contributed to our Bachelor thesis and helped us a lot!

If you have any questions or remarks feel free to contact us: j.senger@student.utwente.nl

Have a nice day!
Kristina, Judith and Sophia

