

**Effectiveness of the Self-Control Intervention aPP (SCIPP) in Enhancing Self-Control
and Emotion Regulation in Students: A Single-Case Experimental Design Study**

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Abstract

Emotion regulation plays a vital role in maintaining and increasing the well-being of students. Self-control influences emotion regulation through shared cognitive processes, including the allocation of cognitive resources, response modulation, goal pursuit, and self-awareness. By strengthening self-control abilities, students may enhance their capacity to regulate emotions effectively, leading to improved emotional well-being and adaptive behaviour. This study presents a Single-Case Experimental Design (SCED) study that examined the effectiveness of the Self-Control Intervention aPP (SCIPP) in enhancing self-control and its impact on emotion regulation among students. The study took 28 days and included four participants. SCIPP, developed based on the Strength Model of self-control, was implemented using an ABAB design, with baseline and intervention phases. During the two intervention phases, SCIPP was used for 7 days. Self-control and emotion regulation were measured daily through self-report questionnaires throughout the full study. The data analysis incorporated visual analysis, randomization tests, and a general intervention effect.

The results revealed no significant effects of SCIPP on self-control and consequently no increase of emotion regulation within the 28-day study period. Visual analysis, randomization tests, and the general intervention effect all supported the absence of significant changes. Limitations, including the short duration of the intervention, the fit for the student population, and the use of self-report measures, should be considered when interpreting the results.

Overall, this SCED study highlights the need for further investigation and improvement in interventions targeting self-control and emotion regulation among students.

Keywords: Single Case Experimental Design, SCT, SCIPP, self-control, emotion regulation, students

Introduction

Emotion regulation (ER) refers to attempts to influence emotions in both ourselves and others and concerns the process involved in recognizing, monitoring, evaluating and modifying emotional reactions (McRae & Gross, 2020). This process is time-limited, situationally bound and encompasses valenced (positive or negative) states. Emotion regulation can include decreasing or increasing either negative or positive emotions (Gross, 2015) So, ER is not limited to down-regulation of negative emotions such as fear, anxiety and stress but includes both up and down-regulation of positive and negative emotions (McRae & Gross, 2020). Sometimes regulation itself is the end point, for example someone may regulate their sadness to feel less sad. On the other side, emotion regulation can be merely a means for achieving a different valued end; someone may be motivated to look more interested in a conversation in order to get a job (Gyurak, Gross & Etkin, 2011). Emotion regulation can be deliberate and conscious such as inhibiting laughter at misbehaviour. But it can also occur unconsciously, such as turning away from upsetting material (Gyurak, Gross & Etkin, 2011; McRae & Gross, 2020).

Emotion regulation is situationally bound, as emotions often occur in response to specific events or stimuli, and may dissipate quickly or change in response to changing circumstances (Gross, 2015). Effective emotion regulation therefore requires rapid and flexible responses to emotional stimuli, as well as the ability to disengage from unproductive regulatory strategies and adopt new ones when necessary. Emotional experiences are typically fleeting and context-dependent, and may require immediate attention and action to be effective (Mauss & Robinson, 2009). Further, the process of emotion regulation is time-limited because individuals have finite cognitive and emotional resources to devote to regulating their emotions, and these resources may become depleted over time or in response to high levels of stress or demand (Gross, 2015). To measure emotion regulation, it is therefore important to take the situationally bound, context dependant and time limited characteristics into account. A research technique

known for collecting real-time data on individuals' experiences, behaviours, and psychological states in their natural environments is Experience Sampling Method (ESM) (Csikszentmihalyi & Larson, 2014). ESM involves participants providing multiple reports throughout their daily lives, typically using mobile devices or other electronic devices. As ESM allows researchers to collect data in real-time and in the participants' natural environments, it provides a valuable and ecologically valid opportunity to capture the dynamic and context-dependent aspects of emotion regulation (Koval, Brose, Pe, Houben, Erbas, Champagne & Kuppens, 2015). Therefore, this study uses ESM to assess daily emotion regulation.

According to McRae & Gross (2020) the way in which individuals are able to manage and adapt their emotions is important to mental health. High levels of emotion regulation are related to greater well-being, higher academic achievement, greater physical health and more positive social outcomes (Côté, Gyurak & Levenson, 2010; Davis & Levine, 2013; Appleton, Loucks, Buka & Kubzansky, 2014; English, John, Srivastava & Gross, 2012). Difficulties in emotion regulation have consequently been found to be associated with mental health problems such as depression (Gross and Muñoz, 1995), anxiety disorders (Campbell-Sills et al, 2006) and posttraumatic stress disorder (McDermott et al, 2009). Difficulties are also associated with more symptoms of psychopathy, lesser relationship satisfaction and lesser well-being (Cameron & Overall, 2018; Chervonsky & Hunt, 2017; English, John, Srivastava & Gross, 2012; English & Eldesouky, 2020; Gross & John, 2003).

The current study investigates emotion regulation in the context of higher education. According to Pekrun, Linnenbrink-Garcia & Perry (2012), the classroom is an emotional surrounding. Students frequently experience emotions such as enjoyment of learning, hope for success, pride in accomplishments, anger about task demands, fear of failing an exam, or boredom in academic settings. Research has shown that both traditional classroom instruction and advanced technology-based learning environments can induce a great variety of such

emotions (D'Mello, 2013; Pekrun, Goetz, Titz, & Perry, 2002). Furthermore, the available evidence implies that these emotions are instrumental for achievement and personal growth. Experiencing positive emotions can help a student envision goals, promote creative problem solving, and support self-regulation (Clore & Huntsinger, 2009; Fredrickson, 2001). On the other hand, experiencing excessive negative emotions about studying and taking exams can impede academic performance, prompt school dropout, and negatively influence health (Zeidner, 1998, 2014). The far-reaching consequences of emotional experiences are also likely reflected in the tragic numbers of suicides related to school or college each year (Furr, Westefeld, McConnell & Jenkins, 2001). A systematic review by Aldao, Nolen-Hoeksma & Schweizer (2010) found that approximately 14% to 20% of college students experience clinically significant difficulties in emotion regulation. Further, Brackett et al. (2012) examined emotion regulation skills in a large sample of high school students and found that about 37% of the students demonstrated low emotion regulation abilities. This, together with the general consequences of emotion regulation, shows that it is important to examine ways to improve emotion regulation among students.

To better understand how emotion regulation in students can be improved, it is important to look at its determinants. Research has shown that self-control is a critical factor in the success of emotion regulation strategies such as cognitive reappraisal and expressive suppression (Gross, 2015). Self-control is defined as the ability to override or prevent unwanted thoughts and or behaviour (Kip et al., 2021). Where emotion regulation specifically targets the regulation of emotions and emotional experiences, self-control encompasses in multiple domains, including cognition, behaviour, impulses and desires (Gross, 2015). Further, emotion regulation strategies specifically involve processes such as reappraisal, suppression and distraction techniques, Self-Control mechanisms and strategies also include impulse control, delay of gratification, focusing attention and goal setting (Tangney, Baumeister & Boone, 2019).

Behaviour related to self-control refers to taking actions that are aligned with valued, long-term goals when being faced with conflicting impulses that grant immediate gratification (Duckworth & Steinberg, 2015). Investigating self-control in relation to emotion regulation is important because self-control is a key factor in successful emotion regulation, and deficits in self-control are associated with a variety of negative outcomes, including mood disorders, substance abuse, and interpersonal difficulties (Hofmann, Schmeichel & Baddely, 2012). Furthermore, self-control may play a crucial role in determining the effectiveness and adaptability of emotion regulation strategies in different contexts and situations. For example, individuals with higher levels of self-control are better able to engage in cognitive reappraisal, a strategy that involves reinterpreting the meaning of emotional stimuli to reduce their impact on affective experiences (Gross, 2015). Similarly, individuals with greater self-control are better able to regulate their facial expressions and body language in response to emotional stimuli, a process known as expressive suppression (Gross & John, 2003). Consequently, deficits in self-control are associated with a variety of negative outcomes related to emotion regulation, including greater emotional reactivity, decreased psychological well-being, and greater risk of psychopathology (Hofmann, Schmeichel & Baddely, 2012). For example, individuals with low self-control may be more likely to experience intense negative emotions such as anger and anxiety, and may have difficulty effectively regulating these emotions in a variety of contexts and situations (Dekkers et al., 2023). Even though mechanisms and strategies of self-control seem to have potential to influence emotion regulation, scientific research shows mixed results on the actual effect of self-control on emotion regulation. To fill this gap and test the effect of self-control on emotion regulation among students, this will be further investigated in this study.

According to the prominent strength model of self-control proposed by Baumeister, Vohs, and Tice (2007), self-control relies on a limited resource that can be depleted with use,

similar to how a muscle gets tired. This "strength model" suggests that self-control can be trained and increased through exercises, thereby enhancing the capacity for self-control acts. Building on this theory, the Self-Control Intervention aPP (SCIPP) was developed as a way to increase self-control levels in individuals, specifically targeting those with (severe) mental illness. SCIPP incorporates Self-Control Training (SCT), a therapeutic approach focused on improving self-control skills through cognitive and behavioural techniques (Heatherton & Wagner, 2011). Previous research has shown promising results of SCT in reducing aggression among individuals with high trait aggression (Denson, Capper, Oaten, Friese & Schofield, 2011) and increasing appropriate behaviour in adults with developmental disabilities (Dixon, Hayes, Binder, Manthey, Sigman & Zdanowski, 2013). However, when examining the existing literature on (digital) SCT in student populations, mixed findings are apparent regarding its effectiveness on self-control. While some studies have reported positive outcomes, demonstrating improvements in self-control skills and associated outcomes in academic settings (Finkenauer, Engels & Boone, 2004), other studies have shown limited or no significant effects.

Although SCIPP was originally designed for individuals with (severe) mental illness, it has the potential to be easily incorporated into the daily lives of students, who are already extensively using mobile devices. However, SCIPP has not yet been implemented in the daily lives of students or a mentally healthy population. Given the mixed results of SCT on self-control in student populations, further research is necessary to examine the effectiveness of digital self-control training, specifically using SCIPP, in increasing self-control among students. Additionally, this study aims to investigate whether the observed increase in self-control positively influences emotion regulation in students, thereby contributing to the research base on both SCT and SCIPP.

To investigate the effectiveness of SCIPP on increasing levels of self-control in students and monitoring whether self-control increases emotion regulation in students, this study uses an Experience Sampling Method (ESM). ESM is a research technique used to collect real-time data on individuals' experiences, behaviours, and emotions in their natural environment (Hektner, Schmidt & Csikszentmihalyi, 2007). Specifically, a Single-Case Experimental Design (SCED) is used. SCED is a research design used to evaluate the effectiveness of interventions with individual participants (Barlow & Hersen, 1984). SCED involves repeated measurement of a target behaviour before, during, and after the implementation of an intervention, with the goal of establishing a causal relationship between the intervention and changes in the behaviour of interest (Kazdin, 2011). SCEDs typically involve a baseline phase in which the target behaviour is measured multiple times over a period of time to establish its stability and variability, followed by one or more treatment phases in which the intervention is implemented and the behaviour is measured again (Kazdin, 2010). The treatment phase is followed by a post-treatment phase in which the behaviour is measured again to evaluate the maintenance of treatment effects.

Goal of the current study

Research has already shown promising theories on the potential positive influence of self-control on emotion regulation. However, mixed results are shown in scientific research on the actual effects. The research that has been done on this relationship has also not monitored and intervened with the daily life of students through an app to increase self-control. Further, when considering the existing scientific literature on (digital) self-control training in student populations, mixed findings are evident. To fill these research gaps, this study investigates the effectiveness of the Self-Control Intervention aPP (SCIPP) in enhancing self-control and its subsequent impact on emotion regulation. Through daily practice and monitoring during the intervention phases, participants aim to improve daily self-control and regulate their emotions.

As this study is based on and part of future studies on SCIPP, trait self-control will be measured weekly besides daily self-control and emotion regulation. Grounded in the strength model, the study hypothesizes that SCIPP will increase daily self-control, further leading to enhanced emotion regulation. The following research questions (RQ) and hypotheses (H) will be investigated.

Research questions

RQ₁ What is the effect of SCIPP on students' daily self-control?

- H₁: SCIPP significantly increases students' daily self-control.

RQ₂ What is the effect of SCIPP on students' daily emotion regulation?

- H₂: SCIPP significantly increases students' daily emotion regulation.

Method

Study design

The design of the study was an introduction-withdrawal Single Case Experimental Design (SCED) with repeated measures in baseline and intervention phases (ABAB). The ABAB design is a type of SCED that involves alternating phases of baseline (A) and intervention (B) to evaluate the effectiveness of an intervention on a target behaviour (Kazdin, 2010). In the ABAB design, the behaviour is measured repeatedly during the baseline phase (A) to establish its stability and variability. Then, the intervention is implemented and the behaviour is measured again during the intervention phase (B). This process is repeated with the removal and reimplementation of the intervention to evaluate its effectiveness on the behaviour.

As established prior to the start of the study, the experiment took 28 days with two times 7 days of baseline measurements and two times 7 days of measurements during the intervention.

Phases were determined based on an existing study (Dekkers et al., 2023). During all phases, participants filled out questionnaires on self-control and emotion regulation once a day. Once a week they filled out another questionnaire on trait self-control. During the intervention phase participants participated in Self-Control Training by doing daily exercises proposed in the SCIPP app. For an overview of the study see Table 1.

Table 1

Overview of the ESM study

Phase	Timeframe	Content
Set up	Day 0	<ul style="list-style-type: none"> • Read the description of the study • Download Ethica and SCIPP • Give informed consent
Baseline	Days 1-7	<ul style="list-style-type: none"> • Once a day: daily self-control questions • Twice a day: emotion regulation questions • Day 1 and Day 7: trait self-control questions
Intervention	Days 8-14	<ul style="list-style-type: none"> • Once a day: daily self-control questions • Twice a day: daily emotion regulation questions • Do daily self-control exercises through SCIPP • Day 14: trait self-control questions
Withdrawal	Days 15-21	<ul style="list-style-type: none"> • Once a day: daily self-control questions • Twice a day: daily emotion regulation questions • Day 21: trait self-control questions
Intervention	Days 22-28	<ul style="list-style-type: none"> • Once a day: daily self-control questions • Twice a day: daily emotion regulation questions

- Do daily self-control exercises through SCIPP
 - Day 28: trait self-control questions
-

Participants

The participants were collected through convenient sampling. For this, the social network of the researchers was used. As for the inclusion criteria, the participants had to be at least 18 years old, master the Dutch language, have an android phone and had to be a student in higher education. The convenience sample resulted in a total of 4 participants who started the study and all of them met the inclusion criteria. For the demographics of the participants, see Table 2.

Measures and Materials

Self-control

To measure trait self-control the Brief Self-Control Scale (BSCS; Tangney, Baumeister & Boone, 2004; Tangney, Baumeister & Boone, 2019) was used (see Appendix 1). According to the studies by Tangney, Baumeister & Boone (2004) The Brief Self Control scale was highly reliable (Cronbach's $\alpha = .83$ and $.85$ and has high test-retest reliability = $.87$.) (Tangney, Baumeister & Boone, 2004). The BSCS measures the trait self-control via thirteen items with a 5-point Likert scale, from 1 (totally agree) to 5 (totally disagree). Higher scores on the questionnaire suggest higher levels of trait self-control. Examples of questions are "I am good at resisting temptation" and "I have a hard time breaking bad habits" (reverse coded).

The daily self-control questions are a combination of previously used questionnaires and self-developed validated questions addressing different elements of self-control (see Appendix 2). Two of the questions on decision making and ego depletion stem from the State

Self-Control Scale (Baumeister, Wright & Carreon, 2018). The other two questions on initiatory control and inhibitory control are developed based on the model of initiatory and inhibitory control (de Ridder, de Boer, Lugtig, Bakker & Hooft, 2011). The questions are previously used by Bagala (2021) and the daily self-control measure was validated by Schankweiler (2022). All four questions were measured on a 5-point Likert-Scale ranging from 1 (not at all) to 5 (very much). Higher scores on the questions reflect a higher level of self-control. An example of a question is ‘I succeeded to resist temptations today’.

Emotion regulation

Emotion regulation was measured daily with two questions derived from a previous ESM study on emotion regulation (Billen, Dekkers & Kip, 2023) (see Appendix 3). The questions are assessed on a five point Likert scale ranging from 1 (totally agree) to 5 (totally disagree). An example of a question is “The last couple of hours, it was easy for me to control my emotions (e.g. sadness, anger)”. Higher scores imply higher emotion regulation.

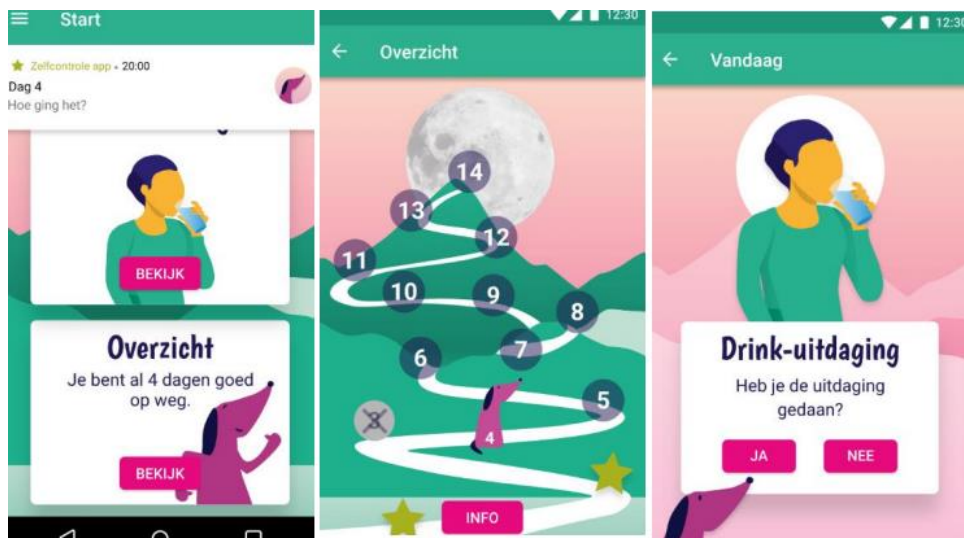
The SCIPP: The Self-Control Intervention aPP

The app used to train self-control in this study is the app SCIPP: the Self-Control Intervention aPP. It is based on the strength model of self-control and was designed specifically with and for people with (severe) mental illness (Dekkers et al., 2023). It is available for Android smartphones and encourages users to use their non-dominant hand during everyday tasks such as opening doors or turning on lights. This daily practice of overriding dominant responses is intended to improve general self-control capacity and lead to enhancements in various self-control domains (Hagger, Wood, Stiff & Chatzisarantis, 2010). The app sends four daily reminders to complete the challenge and at the end of the day, users are prompted to report whether they completed the task. If completed, users will see a reward screen. Additionally, the app provides an overview page to track completed and pending tasks. To increase engagement,

the participants received reminders for the exercises, were guided through the app by a virtual coach and received feedback on their progress. Figure 1 contains screenshots of the app.

Figure 1

Screenshots of SCIPP



Note. This figure features screenshots of the start screen, the task overview and an example of a daily task.

Ethica

Ethica is an online platform accessible via a web browser and smartphone that enables researchers to create, modify, and distribute surveys while viewing participants' data in real-time. This functionality facilitates error identification during the study's runtime and enhances the ecological validity, possibilities, and reliability of data collection (Van Berkel et al., 2017). Participants can use Ethica to complete surveys through any digital device, eliminating the need to carry additional study-related materials and reducing their burden. The platform's trigger logistics are a crucial component of ESM (Lathia et al., 2013) and can remind participants to complete surveys, minimizing their responsibility (Chang et al., 2015). In this study, Ethica was used to administer the questionnaires on self-control and emotion regulation.

Procedure

The study was ethically approved by the Ethical Committee of the University of Twente (230104). Before the start of the study, participants were informed about the goal of the study, the anonymity and confidentiality of the study and then asked to sign an informed consent (see Appendix 4). Afterwards, participants were invited to download the Ethica app and SCIPP in the Google Play store. As the study had an introduction-withdrawal design (ABAB), participants were assessed four times and started out with a baseline phase (A) of 7 days during which they filled out daily questions on both self-control and emotion regulation and a weekly questionnaire on self-control. The study took place remotely. Participants were able to fill out the questionnaires on their mobile phones and perform the self-control exercises without being bound to a location. For the questionnaires, random time sampling was used. The participants were asked to fill out the emotion regulation questions twice a day, every day. They would receive a notification between 11.00 and 13.00 and again between 20.00 and 22.00. In the evening, between 20.00 and 22.00, participants were notified on the self-control questions, this was measured once every day. Further, the trait self-control was measured on day 1, 7, 14, 21 and 28 at 13.00, so five times in total. After being notified about filling out a questionnaire, the participants had to complete the questionnaire within two hours. The timing and time span of filling out the questionnaires is based on an existing protocol from a different study on Self-Control Training (Dekkers et al., 2023). During the intervention phase (B), participants continued with filling out the daily and weekly questionnaires and in addition, participated in self-control exercises which were proposed by the SCIPP application. During the study, the participants were guided through the change of phases by the researcher by receiving notifications.

Data Analysis

Data preparation

Data was put into a long format and the mean scores for daily self-control and emotional regulation were calculated and a separate file with the mean scores was created for each participant and for each variable. These files were used for the analysis using Shiny SCDA, a web-based tool for single-case design analysis (Gage & Lewis-Palmer, 2019). For each analysis, this program is used to create an individual plot and calculate intervention effectiveness on both individual and group level.

Visual analysis

In this study, the Single-Case Experimental Design (SCED) data will be primarily interpreted visually. Visual analysis is an important first step for evaluating intervention effects (Manolov & Solanas, 2017). Emotion regulation and self-control data will be presented as a time series graph. Six features will be considered to examine within- and between-phase data of self-control and emotion regulation patterns visually: level, trend, variability, overlap, and consistency (What Works Clearinghouse, 2019). Level refers to the average magnitude or baseline of these constructs, while trend examines the direction or pattern of change over time or conditions. Variability assesses the extent of fluctuations or dispersion in scores, and overlap explores the degree of similarity or covariation between self-control and emotion regulation. Consistency focuses on the stability or reliability of patterns over time or conditions (What Works Clearinghouse (2019).

Randomization tests

In addition, statistical tests will be conducted to evaluate the statistical significance of the intervention effects. This will be done using the p-value (Kazdin, 2011). Calculating the p-value will be done using randomization according to a study done by Onghena & Edgington (2005) as this allows for evaluating the statistical significance of effects observed within

individual cases. The Shiny SCDA app includes functions to conduct randomization tests and will be used for the analysis.

General intervention effect

Besides the visual analysis and statistical significance testing, it is useful to know the general size of the effect of the intervention to be able to show the magnitude of the effect and to compare the results to different studies (Manolov & Solonas, 2017). In this SCED a meta-analytical procedure will be conducted to obtain the general effect size of the results. For this, the p-values of the several single-case experiments will be combined to determine what the effect of SCIPP is on self-control and emotion regulation.

Results

In total, four participants participated in the study. Table 2 shows the demographics of the participants.

Table 2

Participants' Demographics, Mean Scores Trait Self-Control, Mean Scores Self-Control and Mean Scores Emotion Regulation

	Participant 1	Participant 2	Participant 3	Participant 4
Age	23	24	23	23
Nationality	Dutch	Dutch	Dutch	Dutch
Gender	Female	Female	Male	Female
Trait Self-Control				
Day 1	2.92	3.38	2.77	2.67
Day 7	2.85	3.54	3.54	2.77
Day 14	4.54	3.46	3.08	3.46

Day 21	2.69	4.00	2.92	2.92
Day 28	4.69	4.21	3.54	3.38
Daily Self-Control				
Phase A (Baseline)	3.33	4.14	3.04	3.54
Phase B (Intervention)	4.70	4.32	3.54	3.90
Phase A (Baseline)	4.00	3.83	3.00	3.86
Phase B (Intervention)	4.71	4.25	3.08	3.50
Emotion regulation				
Phase A (Baseline)	4.32	4.58	4.54	4.25
Phase B (Intervention)	4.65	4.29	4.25	4.07
Phase A (Baseline)	4.07	3.87	4.46	4.14
Phase B (Intervention)	4.79	3.88	4.08	4.21

Trait self-control

Looking at the mean scores on trait self-control of the participants, there was an increase during intervention phases compared to baseline phases (see Table 2). Further, there was an increase in the trait self-control scores of all participants on the last day of the study, compared to the first day of the study (see Table 2).

Participant 1

Daily Self-Control

The visual analysis of the daily self-control data of Participant 1 reveals promising findings. Figure 2 illustrates that Participant 1 exhibited a consistent trend of scoring higher on self-control during the intervention phase, suggesting an improvement in self-control abilities while utilizing the SCIPP app. Consequently, the mean score for baseline phase A1 was $M =$

3.33 and baseline phase A2 was $M = 4.00$, with higher scores on intervention phase B1 ($M = 4.70$) and intervention phase B2 ($M = 4.71$). This finding implies that SCIPP had a positive effect on enhancing self-control in Participant 1.

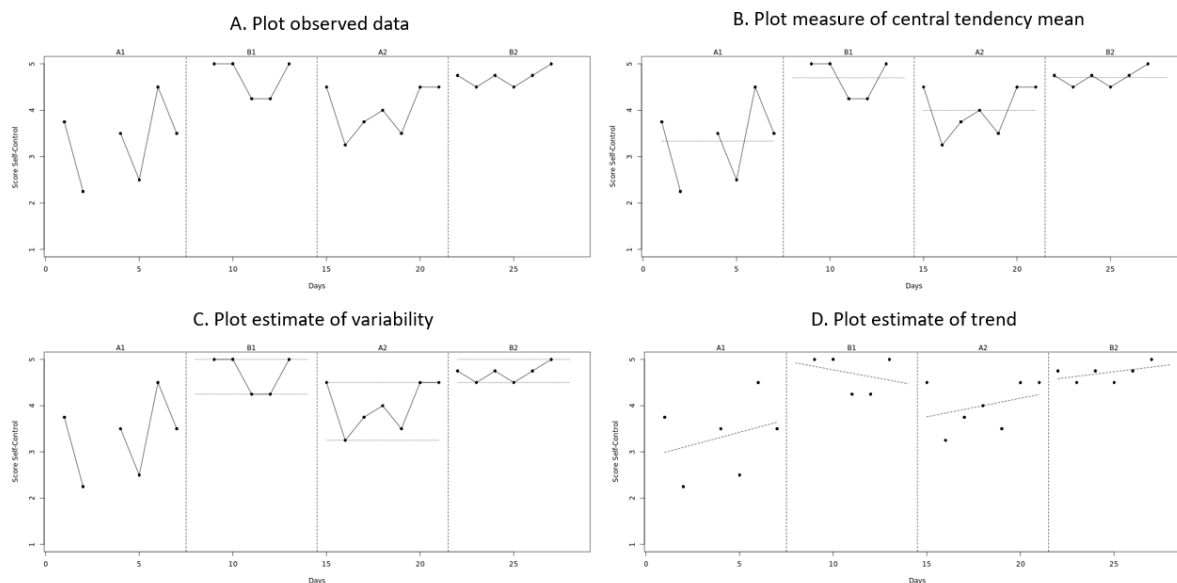
Figure 2C highlights an interesting pattern in the variability of daily self-control scores. During the use of SCIPP, there was a reduction in variability, indicating more consistent scores on self-control during the use of SCIPP. Conversely, in the baseline phases, there was more variation in scores with specifically lower scores on self-control, suggesting a greater variability in self-control abilities when not using SCIPP.

Overall, these results indicate that the intervention, specifically the utilization of the SCIPP app, may have had a beneficial impact on Participant 1's self-control. The central tendency of higher scores during the intervention phase suggests an enhancement in self-control skills. Moreover, the reduced variability during the use of SCIPP suggests increased consistency in self-control abilities.

However, the statistical analysis of the data on self-control revealed $p = 0.95$ which indicates that there is no evidence of a significant difference in self-control between the baseline and intervention phases. So, the results suggest that the intervention did not have a substantial impact on improving self-control and therefore the hypothesis that SCIPP significantly increases daily self-control of participant 1 is rejected.

Figure 2

Visual Analysis of Daily Self-Control Participant 1



Emotion regulation

When analysing the visual data for emotion regulation, Figure 3 indicates that, on average, Participant 1 tended to score higher on emotion regulation during the intervention phases compared to the non-intervention phases. In line with this, the average score of Participant 1 for the baseline phase A1 was $M = 4.32$, the first intervention phase B1 showed $M = 4.65$, second baseline phase A2 $M = 4.07$ and the last intervention phase B2 showed $M = 4.79$. This finding suggests that the use of SCIPP had a positive impact on the participants' ability to regulate emotions.

Moreover, when examining the variability in emotion regulation scores, it was observed that Participant 1 demonstrated a more stable score during the periods when using the SCIPP app, in contrast to the periods when not utilizing the app. This suggests that the intervention provided by the SCIPP app contributed to maintaining a consistent level of emotion regulation for Participant 1 (See figure 3C & figure 3D).

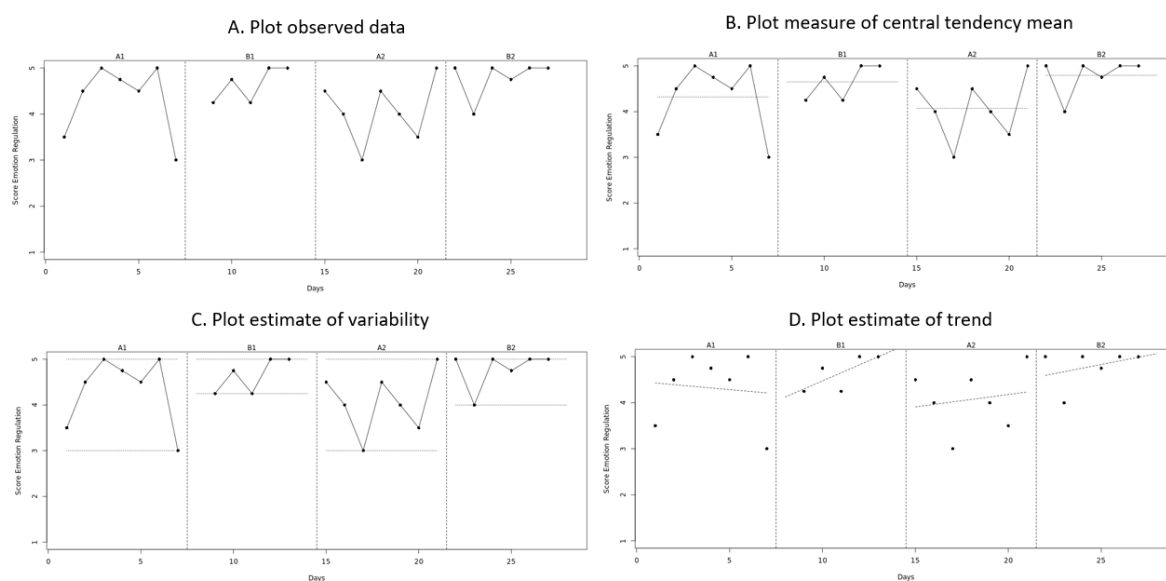
Overall, these results indicate that the intervention, particularly the use of the SCIPP app, may be associated with improvements in daily emotion regulation within Participant 1.

The intervention phases showed higher scores on average, indicating a positive effect on emotion regulation, and Participant 1 specifically exhibited increased stability in their emotion regulation scores while utilizing the SCIPP app.

However, the statistical analysis of the emotion regulation data of participant one yielded a p-value of $p = 0.91$. This p-value indicates that there is no statistically significant difference between the baseline and intervention phases in relation to the outcome measure being assessed. Therefore, the hypothesis that SCIPP significantly increases daily emotion regulation of Participant 1 is rejected.

Figure 3

Visual Analysis Emotion Regulation Participant 1



Participant 2

Daily Self-Control

The visual analysis of the data indicates that, on average, participant 2 showed slightly improved self-control during the intervention phase compared to the baseline phases (Figure 4B). Mean scores of the phases also suggest this as the baseline phases A1 and A2 had lower

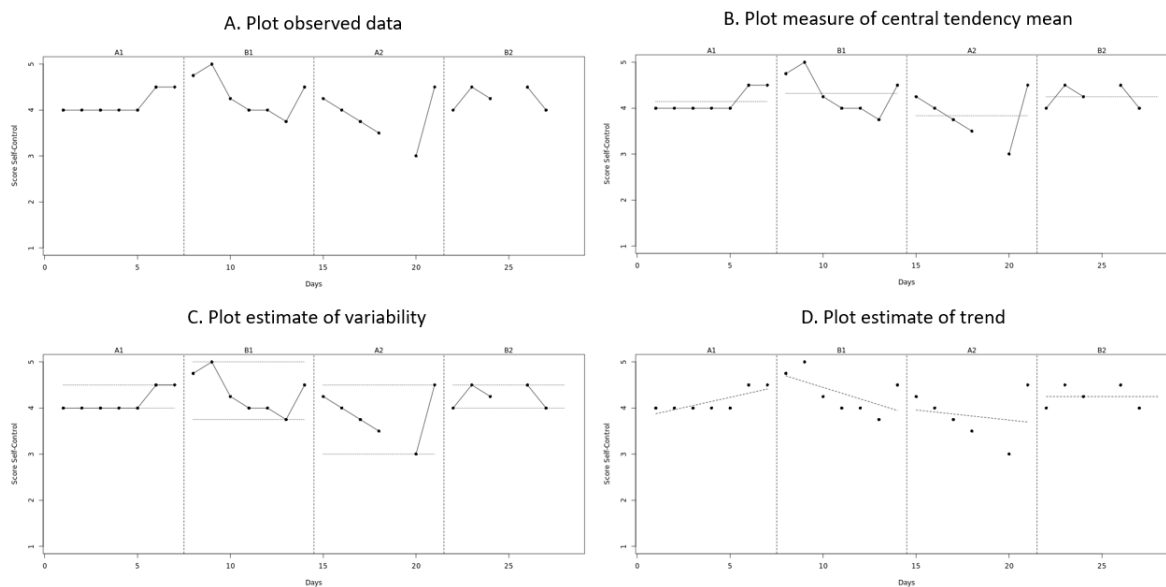
mean scores ($M = 4.14$, $M = 3.83$) compared to intervention phases B1 and B2 ($M = 4.32$, $M = 4.25$)

However, high variability in self-control scores were observed during both phase B1 and phase A2, suggesting significant variations in both intervention and baseline phases (Figure 4). The absence of a clear trend or consistent stability in self-control scores during the intervention phase suggests that the intervention may not have consistently impacted participants' self-control skills.

In the statistical analysis of the data of Participant 2 self-control showed $p = 0.83$. This result indicates that there is no statistically significant difference between the baseline and intervention phases in terms of self-control of Participant 2. Therefore, the hypothesis that SCIPP significantly increases daily self-control of participant 2 is rejected.

Figure 4

Visual Analysis Self-Control Participant 2



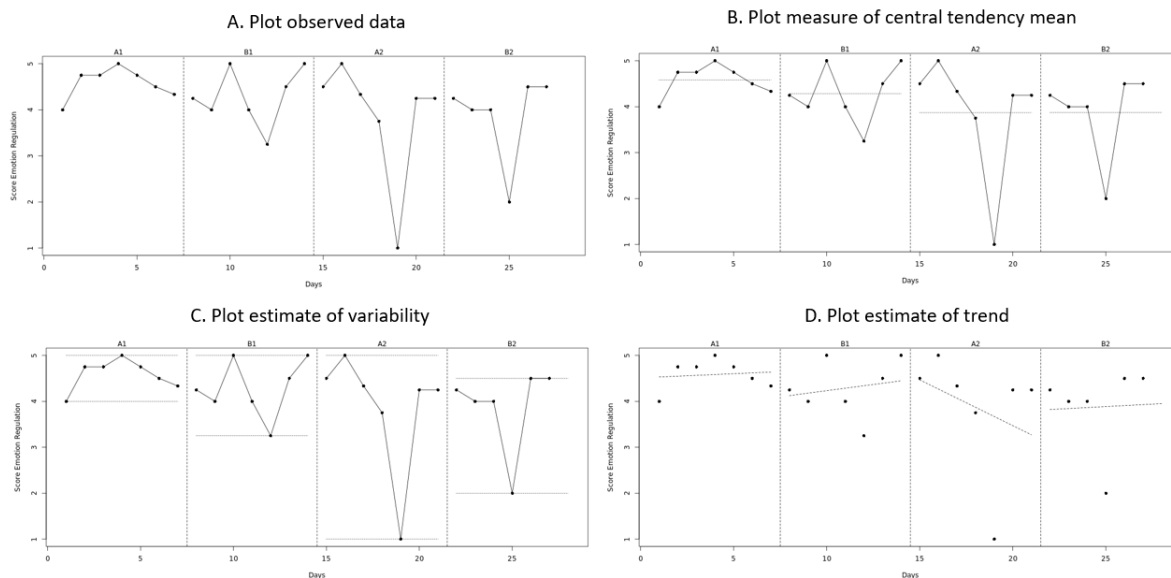
Emotion Regulation

Figure 5B indicates a downward trend in emotion regulation scores throughout the experiment. Looking at the mean scores, these declined or stayed similar over the course of the study with A1 $M = 4.58$, B1 $M = 4.29$, A2 $M = 3.87$ and B2 $M = 3.88$. This suggests that, on average, participant 2's ability to regulate their emotions decreased over the course of the study. Additionally, Figure 5C and 5B exhibit significant variability in emotion regulation scores, indicating fluctuations and individual differences in participants' emotional regulation abilities. These findings suggest that the intervention may not have effectively improved emotion regulation of Participant 2.

The obtained p-value of the statistical analysis of the emotion regulation data of Participant 2 was $p = 0.54$. This p-value indicates that there is no statistically significant difference between the baseline and intervention phases in terms of emotion regulation. In other words, the p-value indicates that the intervention did not significantly improve emotion regulation. Therefore, the hypothesis that SCIPP significantly increases daily emotion regulation is rejected.

Figure 5

Visual Analysis Emotion Regulation Participant 2



Participant 3

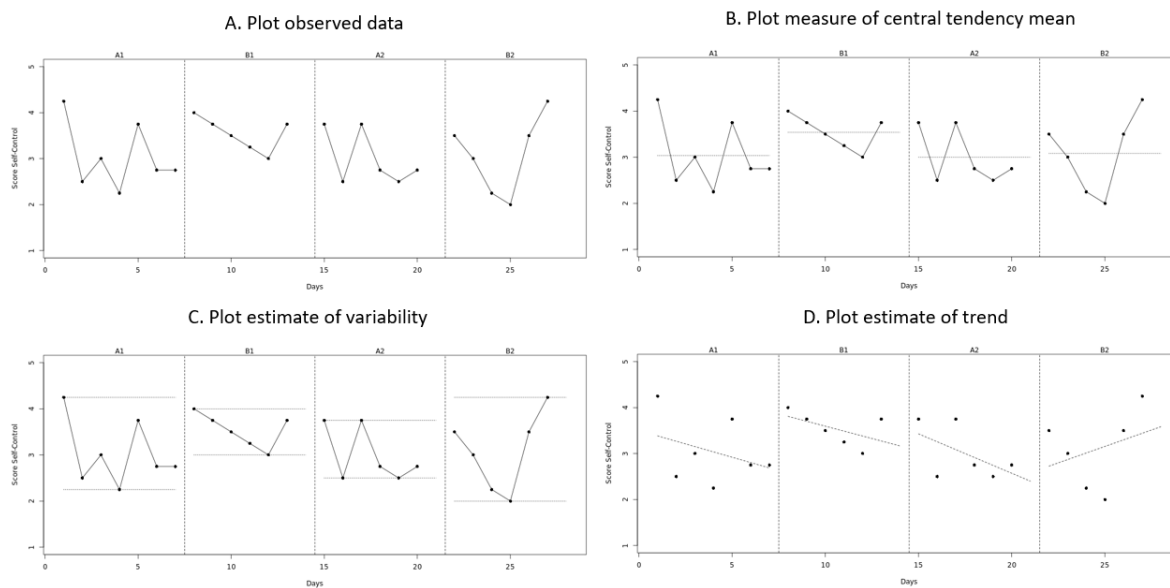
Daily Self-Control

Looking at the outcomes of the visual analysis of the self-control data of Participant 3, figure 6B shows the mean scores to be higher during the intervention phases (B1, B2). The mean scores on self-control are respectively higher during intervention phase B1 ($M = 3.54$) and B2 ($M = 3.08$) compared to baseline phases A1 ($M = 3.04$) and A2 ($M = 3$). This finding shows potential of the SCIPP app for increasing self-control.

The randomization test for self-control showed $p = 0.84$, indicating no statistically significant difference between the baseline and intervention phases in terms of self-control. These findings suggest that SCIPP did not have a significant impact on improving self-control of Participant 3 and consequently hypothesis that SCIPP significantly increases daily self-control is rejected.

Figure 6

Visual Analysis of Self-Control Participant 3



Emotion Regulation

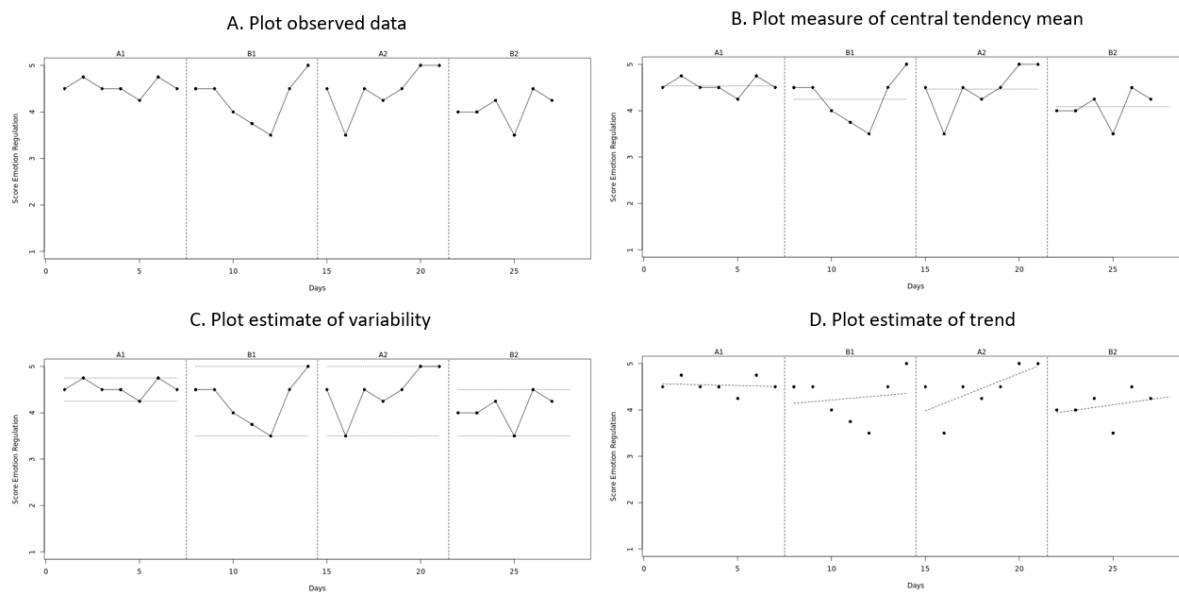
Looking at figure 7B, there appears to be a slight tendency for higher levels of emotion regulation during the baseline phases (A1, A2) in comparison to the intervention phases (B1, B2). Mean scores also show this effect as the mean scores on emotion regulation in the baseline phases A1 ($M = 4.54$) and A2 ($M = 4.46$) are higher, compared to the scores during the intervention phases B1 ($M = 4.25$) and B2 ($M = 4.08$). This result suggests that the intervention SCIPP did not increase emotion regulation and even decreases scores on emotion regulation for Participant 3.

Variability in scores seems to be highest during B1 and A2, indicating that SCIPP did not influence the stability of emotion regulation for Participant 3 (Figure 7C, Figure 7D).

The randomization test showed $p = 0.10$, suggesting no statistically significant difference between the baseline and intervention phases in terms of emotion regulation for Participant 3. These findings indicate that SCIPP did not have a significant impact on improving Participant 3's emotion regulation abilities and rejects the hypothesis that SCIPP significantly increases daily emotion regulation.

Figure 7

Visual Analysis Emotion Regulation Participant 3



Participant 4

Daily Self-Control

In Figure 8B, the first intervention phase (B1) demonstrated an increase in self-control scores compared to the baseline phases, indicating a positive effect of the intervention. This suggests that the intervention had a beneficial influence on Participant 4's self-control abilities, as reflected by the higher mean score of $M = 3.90$ during B1. However, the overall mean scores across the baseline and intervention phases did not show consistent improvement. Baseline phase A1 had a score of $M = 3.54$, intervention phase B1 had a higher score of $M = 3.90$, and both A2 and B2 had similar scores of $M = 3.86$ and $M = 3.50$, respectively. These findings suggest that SCIPP does not have promising results for increasing daily self-control in Participant 4.

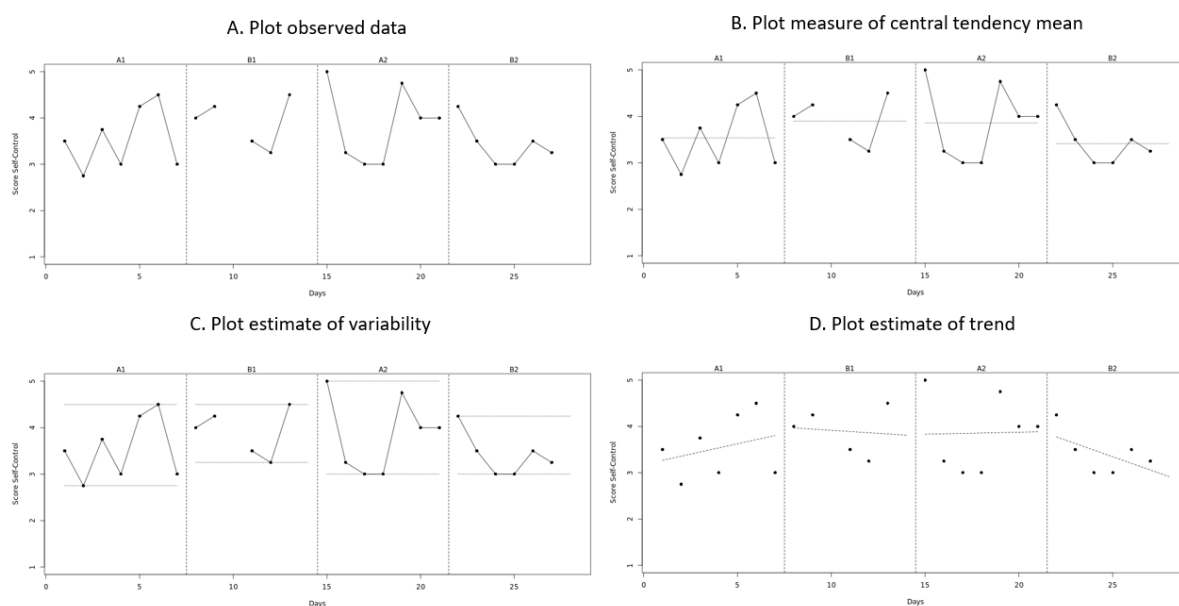
In terms of variability, the visual analysis demonstrates high variability in self-control scores across all phases (Figure 8C, Figure 8D). However, when comparing the baseline and

intervention phases, there appeared to be less variability during the intervention phases. This suggests that the intervention might have contributed to a more consistent level of self-control among participants, reducing the range of scores observed.

The randomization test conducted on self-control resulted in $p = 0.41$. This result suggests that the observed differences in self-control scores between the baseline and intervention phases could be due to random variation or factors unrelated to the intervention itself. The randomization test did not provide sufficient evidence to support a significant effect of SCIPP on improving self-control and therefore the hypothesis that SCIPP significantly increases daily self-control of participant 4 is rejected.

Figure 8

Visual Analysis Self-Control Participant 4



Emotion Regulation

When examining the tendency of emotion regulation scores of Participant 4, there were minimal changes observed between the phases (Figure 8). The mean scores further support this observation, as there were no substantial increases or decreases in emotion regulation scores

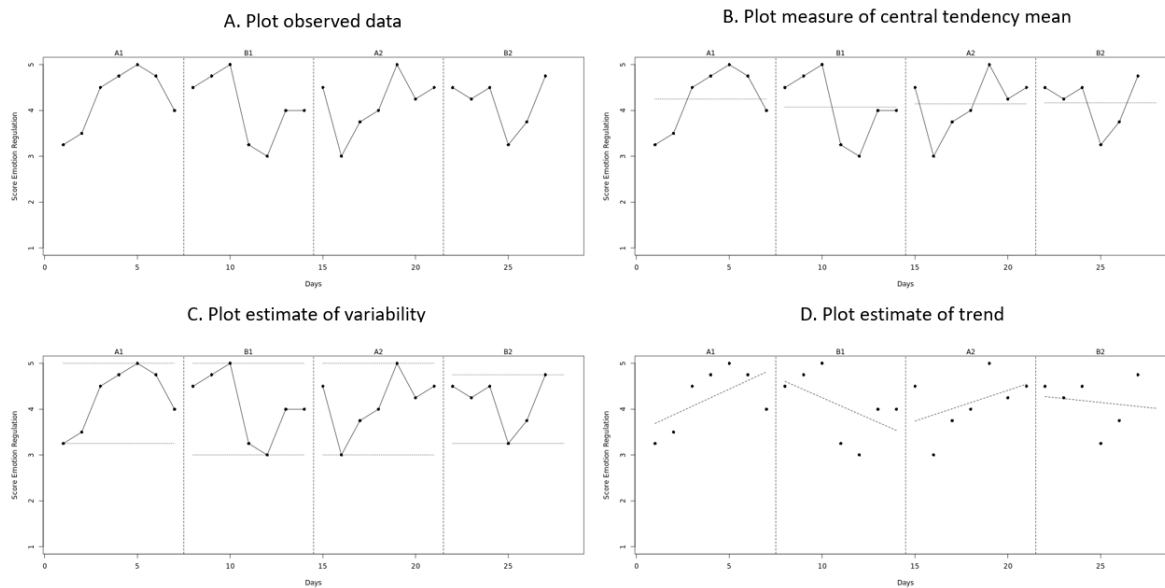
across the phases; baseline phase A1 ($M = 4.25$), intervention phase B1 was ($M = 4.07$), baseline phase A2 ($M = 4.14$), and intervention phase B2 ($M = 4.21$). These scores suggest that overall, the SCIPP intervention did not have an impact on increasing emotion regulation for Participant 4.

The estimate of variability and trend analysis revealed a significant amount of variability in emotion regulation scores (Figure 9C, Figure 9D). This indicates that Participant 4 exhibited fluctuations in their emotion regulation abilities throughout the study. The lack of a clear trend in the scores further supports the notion of high variability, suggesting that SCIPP did not consistently influence Participant 4's emotion regulation skills.

The randomization test showed a p-value of $p = 0.33$ suggesting no statistically significant difference between the baseline and intervention phases in terms of emotion regulation. These findings indicate that the intervention did not have a significant impact on improving participants 4's emotion regulation abilities and therefore the hypothesis that SCIPP significantly increases daily emotion regulation is rejected.

Figure 9

Visual Analysis Emotion Regulation Participant 4



Intervention Effect across Participants

Self-Control. The combined p-value test of self-control resulted in a p-value of $p = 0.96$. This p-value indicates that there is no statistically significant difference between the baseline and intervention phases in terms of self-control.

Emotion Regulation. For emotion regulation, the combined p-value test showed a p-value of $p = 0.42$, indicating no statistically significant difference between the baseline and intervention phases. This suggests that overall, SCIPP did not have a statistically significant effect on emotion regulation.

Discussion

The present SCED study aimed to examine the effectiveness of SCIPP in increasing self-control and subsequently the effect of self-control on emotion regulation among students. However, the results indicated that SCIPP did not have a significant positive effect on daily self-control and no significant effect on emotion regulation. This implies the need for further research on the effect between self-control and emotion regulation in students, the use of digital interventions such as SCIPP and the measurement of these constructs in the lives of students.

The lack of significant effects observed in this study raises the possibility that the SCIPP intervention may not be effective in enhancing self-control and emotion regulation among students. When considering the existing scientific literature on (digital) self-control training in student populations, mixed findings are evident. Some studies have reported positive outcomes, indicating that self-control interventions can lead to improvements in self-control skills and associated outcomes in academic settings (Finkenauer, Engels & Boone, 2004). However, other studies have shown limited or no significant effects, suggesting that not all interventions yield the desired results. For example, a systematic review by Smith, Stuart & O'Connor (2018) examining digital self-control training programs in student populations found inconsistent findings regarding their effectiveness. Similarly, a study by Ayduk, Mendoza-Denton, Mischel, Downley & Rodriguez (2000) investigating a specific self-control intervention in college students found no significant improvements in self-control outcomes. These findings suggest that the lack of effectiveness observed in the present study aligns with the varying results reported in the broader literature, highlighting the need for further exploration and refinement of self-control interventions for student populations.

While SCIPP is based on the strength model of self-control, it is important to acknowledge that this theoretical framework has received both support and criticism within the scientific literature. The strength model posits that self-control operates as a limited resource that can be depleted through effortful tasks, leading to subsequent impairments in self-control abilities (Baumeister, Bratslavsky, Muraven & Tice, 1998). However, recent research has questioned the validity and generalizability of this model, which might have impacted the effectiveness of SCIPP. For instance, Inzlicht, Schmeichel & Macrae (2014) proposed the motivational control theory, which suggests that the effects observed in the strength model may be driven more by motivation rather than a limited resource. They argue that fluctuations in self-control performance may be better explained by changes in motivation and engagement

with the task at hand. Furthermore, the process model of self-control proposed by Baumeister, Wright & Carreon (2018) emphasizes the role of goal setting, monitoring, and feedback in self-regulation, suggesting that self-control is a dynamic process influenced by various cognitive and motivational factors. These alternative models highlight the complexity of self-control and call for a more nuanced understanding beyond the constraints of the strength model in interventions. In line with this, future research overall could benefit from exploring alternative theoretical frameworks besides the strength model to gain a deeper understanding of self-control processes and to develop more effective interventions.

The lack of significant effects of SCIPP on self-control and subsequent emotion regulation in the present study may also be attributed to the influence of various stressors and demands commonly experienced by students, particularly during their academic years. Previous research has indicated that stress has a negative impact on self-control abilities (Richardson, Abraham, & Bond, 2012). Students often face multiple stressors such as academic workload, social pressures, and time constraints, which can deplete their self-control resources and hinder their ability to effectively regulate their emotions (Duckworth & Tsukayama, 2013). These stressors may have limited the potential effectiveness of the SCIPP intervention, as students may have been already taxed by the daily demands of their academic and personal lives. Consequently, the intervention may not have been able to sufficiently improve self-control and emotion regulation among the student participants. A more comprehensive understanding of students' specific self-control and emotion regulation difficulties could also inform the development of interventions that better address their needs. By exploring and taking into account their needs and potential stressors, interventions might show better results.

Another factor to consider is the use of questionnaires as a measurement tool in assessing self-control and emotion regulation. Questionnaires rely on participants' self-report, which is subjective and may be influenced by various biases, such as social desirability (Mortel,

2008). Participants may have been inclined to respond in a way that they believe aligns with societal expectations or portrays them in a favourable light. This can lead to over-reporting of positive changes or improvements in self-control and emotion regulation during both baseline and intervention phases, potentially deflating the perceived effectiveness of the SCIPP intervention. Further, the use of self-report measures alone may not fully capture the complex nature of self-control and emotion regulation. Self-control and emotion regulation often involve automatic processes that occur without conscious awareness. Unconscious processes, such as habit formation or emotional reactions, are often automatic and occur without conscious awareness. They are deeply ingrained in individuals' cognitive and behavioural patterns, and participants may not have been fully aware of these processes or able to accurately report on them using self-report questionnaires (Moors, De Houwer, Hermans, Wanmaker, van Schie & Van Harmelen, 2017). Further, self-control and emotion regulation are associated with physiological and neurobiological processes in the body and brain (Ochsner & Gross, 2015). For example, studies using neuroimaging techniques, such as functional magnetic resonance imaging (fMRI), have revealed that self-control and emotion regulation involve the prefrontal cortex, anterior cingulate cortex, and other brain regions associated with cognitive control processes (Hare, Camerer & Rangel, 2009; Hofmann, Friese & Strack, 2009; Ochsner & Gross, 2005; Pessoa, 2008). These regions are responsible for exerting top-down control over emotional responses and modulating activity in subcortical regions involved in emotion generation. These processes, such as heart rate variability or neural activation patterns, can provide valuable insights into individuals' self-control and emotion regulation abilities (Thayer & Lane, 2000; Etkin, Egner & Kalisch, 2011). Self-report questionnaires may not capture these underlying physiological and neurobiological mechanisms. Further, physiological measures, such as heart rate variability (HRV) and skin conductance, have been used to assess the physiological correlates of self-control and emotion regulation (Thayer & Lane, 2000).

Research has shown that individuals with better self-control abilities exhibit greater HRV, indicating increased vagal tone and parasympathetic nervous system activity (da Estrela, 2020). This suggests a link between self-control and physiological processes related to stress regulation and emotional regulation. Overall, including different measures, such as behavioural observations or physiological indicators, could provide a more comprehensive assessment of these constructs and potentially yield different results as processes of self-control and emotion regulation can occur unconsciously and also because it is less susceptible to social desirability bias (Hofmann, Schmeichel & Baddeley, 2012). Future research can try including more measures, such as behavioural observations or physiological indicators, to provide a more comprehensive assessment of the constructs and potentially yield different. For example, a SCED study on SCIPP could be combined with Ecological Momentary Assessment (EMA) to investigate physiological information through the use of sensors that measure real-time data on participants' experiences, behaviours, and physiological states in their natural environments, randomly throughout the day.

An additional finding was the marked variability in self-control scores over the month of the study. One possible explanation for the variability in scores is the short duration of the study and each of the intervention phases. The phases were only 7 days each, which may have limited the participants' opportunity to acclimate or adjust to the intervention versus baseline phases. Developing self-control and emotion regulation skills often require repeated practice and habit formation. According to Gardner, Lally & Wardle (2012) it takes time for individuals to internalize and automatize new strategies or behaviours. Short-term interventions may not provide sufficient opportunities for participants to fully integrate and consolidate these skills, leading to limited observable changes (Lally, van Jaarsveld, Potts & Wardle, 2010). These findings indicate that switching between using and not using SCIPP only for 7 days each time may have been too short for students to consolidate self-control skills. Besides not allowing

participants to effectively develop self-control and emotion regulation skills, long-term effects of SCIPP on self-control and emotion regulation could not be assessed within the relatively short scope of this study. Future research could consider longer intervention periods and follow-up assessments to examine the sustainability of any potential effects.

Lastly, the present study did not provide evidence to support the expectation that self-control would positively influence emotion regulation. While self-control is generally acknowledged as important for regulating emotions, scientific literature suggests that its impact on emotion regulation may not always be direct (Tice, Baumeister, Schmueli & Muraven, 2007). The relationship between self-control and emotion regulation is influenced by various factors, including affective states and situational circumstances. Positive affect, for instance, has been found to enhance self-regulation following ego depletion, thereby potentially improving emotion regulation (Tice et al., 2007). This indicates that the connection between self-control and emotion regulation is complex and contingent upon contextual variables. Additionally, research has shown that individuals can exhibit high levels of self-control but still experience difficulties in emotion regulation, indicating that these abilities can operate independently and may not always have a direct influence on each other (Muraven & Baumeister, 2000). Emotion regulation itself is greatly influenced by situational factors, such as the specific context, social interactions, and environmental cues. These situational factors can override or interact with self-control processes, leading to variations in the relationship between self-control and emotion regulation. For example, individuals with strong self-control may struggle to regulate their emotions in the presence of external triggers or stressors, despite their self-control capabilities. Furthermore, while self-control and emotion regulation are related constructs, research suggests that they have distinct effects on behaviour and well-being (Muraven & Baumeister, 2000). Although interconnected, these constructs can independently contribute to psychological processes and outcomes. This highlights the importance of

recognizing the separate effects of self-control and emotion regulation and their respective contributions to individuals' behaviour and well-being. So, existing scientific literature suggests that the relationship between self-control and emotion regulation is complex and influenced by various factors, including affective states, situational circumstances, and the independence of these constructs. Understanding the nuanced nature of this relationship is crucial for comprehending their roles in psychological processes and their implications for individuals' behaviour and well-being.

Strengths and limitations

The present study examining the effectiveness of SCIPP on self-control and emotion regulation in students has several strengths. First of all, the study employed a SCED design, which allowed for a within-subject comparison of baseline and intervention phases. This design is particularly well-suited for assessing the effectiveness of interventions on individual participants and provides a robust methodological approach for analysing within-subject changes over time (Barlow & Nock, 2009) and consequently gave a comprehensive examination of the responses to the study. Further, each participant completed the 28-day SCED study. The strong adherence observed in this study is a significant strength and is consistent with prior research emphasizing the importance of clear communication, positive researcher-participant relationships, engaging study design, and appropriate incentives (Brehaut et al., 2012; Watson et al., 2017). Explaining the study purpose and procedures effectively helped participants understand their role, leading to increased motivation and adherence (Gollwitzer & Sheeran, 2006). Regular communication and check-ins fostered a positive researcher-participant relationship. Additionally, the personalized nature of the SCED design and inclusion of incentives and feedback reinforced participants' commitment (Kennedy, 2005; Latham & Locke, 2006). The high adherence rates among students not only enhanced the internal validity of the study but also demonstrate the commitment and cooperation of students

and underscores the potential of conducting similar studies using SCED among students. Lastly, the findings of this SCED study contribute to the existing literature on self-control and emotion regulation interventions in student populations. By investigating the specific effects of SCIPP, the study addresses a gap in the current knowledge and provides valuable insights into the potential benefits or limitations of this intervention. For example, the use of different theories besides the strength model on self-control such as the motivational control theory and the process model of self-control, taking into account the stressors and needs of students and potentially using multidimensional measurement methods, might enhance the effectiveness of SCIPP.

Besides strengths, it is important to acknowledge the limitations of this study. One potential limitation of this study is the limited diversity of the four participants who took part in the SCED. The homogeneity of the participant characteristics, such as age, nationality and the high average scores on trait self-control, may limit the generalizability of the findings to a broader student population. As a result, this should be taken into account when generalizing the results to larger and more diverse student populations. Future research with a larger and more diverse sample would help to enhance the generalizability of the findings and provide a more comprehensive understanding of the effectiveness of SCIPP on self-control and emotion regulation in various student groups. Another limitation relates to the measurement of emotion regulation. More specifically, emotion regulation was assessed using only two questions “The last couple of hours, it was easy for me to control my emotions (e.g. sadness, anger)” and “In the past few hours, I was too emotional (for example, sad, angry) for the situation I was in”. These two questions may not fully represent emotion regulation measurement because they focus primarily on the immediate experience of emotions rather than the regulation or management of those emotions (Gratz & Roemer, 2004). For example, the first question asks about the ease of keeping emotions under control, but it does not capture the strategies or

techniques individuals employ to regulate their emotions. It only assesses the subjective perception of emotional control without delving into the specific regulatory processes. The second question assesses the level of emotional intensity experienced in a particular situation, but it does not capture the regulatory efforts individuals may have made to manage or modulate those emotions. It focuses more on the emotional experience rather than the regulation process itself. Emotion regulation refers to the processes and strategies individuals use to influence the type, intensity, duration, or expression of their emotions in order to adaptively respond to various situations (Gross, 1998). Therefore, to fully capture emotion regulation in a SCED study, it may be important to include items or measures that assess various aspects such as awareness of emotions, selection of appropriate regulation strategies, implementation of those strategies, and evaluation of the effectiveness of the regulation efforts rather than solely focusing on the immediate experience.

Conclusion

In conclusion, the findings of this study suggest that the SCIPP intervention did not effectively increase self-control, and as a result, no significant impact on emotion regulation among students was observed. Several factors, including the characteristics of the student population, the measurement of constructs, and the study's limited scope, may have contributed to these results. Although SCIPP did not yield the desired improvements in self-control and emotion regulation, this study contributes to the growing body of research on Single-Case Experimental Design (SCED) and highlights the need for further investigation and exploration of alternative approaches that may effectively enhance self-control and emotion regulation in students. Moreover, the high adherence of the participants demonstrates the utility of SCED as a means of monitoring self-control and emotion regulation in student populations.

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Appendix

Appendix 1 Trait Self Control Questionnaire

1. Afgelopen week was ik goed in het weerstaan van verleidingen
2. Afgelopen week vond ik het moeilijk om slechte gewoonten te doorbreken
3. Afgelopen week was ik lui
4. Afgelopen week zei ik ongepaste dingen
5. Afgelopen week deed ik dingen die slecht voor me waren, omdat ze leuk waren
6. afgelopen week weigerde ik dingen die slecht voor me waren
7. Ik wilde dat Ik meer zelfdiscipline had afgelopen week
8. Mensen zouden zeggen dat ik een ijzeren zelfdiscipline had afgelopen week
9. Plezier en gezelligheid weerhielden me er afgelopen week van om werk gedaan te krijgen
10. Ik had afgelopen week moeite om me te concentreren
11. Afgelopen week was ik in staat effectief te werken aan mijn doelen
12. Afgelopen week kon ik mezelf niet weerhouden iets te doen, ook al wist ik dat het verkeerd voor me was
13. Ik handelde afgelopen week vaak zonder alle alternatieven te overdenken

Appendix 2 Daily Self-Control Questions

1. Ik vond het vandaag moeilijk om beslissingen te maken, zelfs over simpele dingen.
2. Ik had vandaag minder mentale energie dan normaal.
3. Het is me vandaag gelukt om te doen wat ik van plan was.

4. Het is me vandaag gelukt om verleidingen te weerstaan.

Appendix 3 Emotion Regulation Questions

1. In de afgelopen paar uur, was het gemakkelijk voor mij om mijn emoties onder controle te houden (bijv. verdriet, woede).

2. De afgelopen uren was ik te emotioneel (bijv. verdrietig, boos) voor de situatie waarin ik mij bevond.

Appendix 4 Informed Consent

TOESTEMMINGSFORMULIER

Studie: Het testen van de effectiviteit van de interventie SCIPP.

- Ik begrijp dat Brigit Beukeveld en Emma Simons aan mij vragen om mee te doen aan een onderzoek naar zelfcontrole. Ik ga daarvoor de Ethica app en de SCIPP app gebruiken.
- Ik ben voldoende geïnformeerd over het onderzoek door middel van een separaat informatieblad. Ik heb het informatieblad gelezen en heb daarna de mogelijkheid gehad vragen te kunnen stellen. Deze vragen zijn voldoende beantwoord.
- Ik begrijp dat mijn informatie vertrouwelijk en anoniem wordt verwerkt en gepubliceerd.
- Ik heb genoeg tijd gehad om na te denken of ik mee wil doen.
- Ik neem vrijwillig deel aan dit onderzoek. Er is geen expliciete of impliciete dwang voor mij om aan dit onderzoek deel te nemen. Het is mij duidelijk dat ik deelname aan het onderzoek op elk moment, zonder opgaaf van redenen, kan beëindigen. Ik hoef een vraag niet te beantwoorden als ik dat niet wil.
- Ik doe mee aan de studie en geef toestemming dat mijn data gebruikt wordt voor het onderzoek.

Naam:

Handtekening: Datum:

Ondergetekende, verantwoordelijke onderzoeker, verklaart dat de hierboven genoemde persoon zowel schriftelijk als mondeling over het bovenvermelde onderzoek is geïnformeerd. Zij verklaart tevens dat een voortijdige beëindiging van de deelname door bovengenoemde persoon, van geen enkele invloed zal zijn op de zorg die hem of haar toekomt.

Naam:

Handtekening: Datum:

Appendix 5 Information Letter

Beste

Deelnemer,

Bedankt voor je interesse in onze studie! Via deze brief willen wij je op de hoogte brengen van onze studie en geven wij informatie over hoe de studie er voor jou uit zal gaan zien.

1. Doel van het onderzoek

Dit onderzoek wordt geleid door Brigit Beukeveld en Emma Simons in het kader van hun masterthesis psychologie onder leiding van dr. Tessa Dekkers.

Het doel van dit onderzoek is het testen van een app (SCIPP) om zelfcontrole mee te trainen en te onderzoeken hoe zelfcontrole verband houdt met verschillende concepten.

2. Wat moet je doen als je meedoet?

Doe je mee aan het onderzoek? Dan duurt dat in totaal 28 dagen waarbij je deelneemt aan 2 onderdelen; het invullen van vragenlijsten via Ethica, en het gebruik van de app SCIPP.

Vragenlijsten invullen via Ethica

Je zal deelnemen aan een onderzoek waarbij we informatie zullen vergaren door meerdere (korte) vragenlijsten voor te leggen gedurende een periode van 29 dagen, welke je kunt invullen via je mobiele telefoon. Deze vragenlijsten vul je dagelijks in, soms meerdere malen, gedurende de gehele periode van het onderzoek. Je zal elke dag gevraagd worden deze vragenlijsten in te vullen tussen 11.00 uur en 13.00 uur en tussen 20.00 uur en 22.00 uur. Je zult via Ethica herinneringen ontvangen wanneer je deze vragenlijsten in moet vullen. Daarnaast zal er wekelijks een extra vragenlijst uitgevraagd worden.

SCIPP app: de app om je zelfcontrole te trainen

Verder wordt je gevraagd om de dagelijkse zelfcontrole oefeningen uit te voeren die in de app SCIPP weergegeven worden. Deze interventie vindt plaats volgens een zogenaamd ABAB design. Dit houdt in dat je bepaalde dagen van het onderzoek de app SCIPP wel gebruikt, en bepaalde dagen niet. Hieronder zie je een overzicht van de dagen dat je deze app wel gebruikt, en op welke dagen niet.

Dag 1 t/m 7 **GEEN** gebruik maken van SCIPP en bijkomende training

Dag 8 t/m 14 **WEL** gebruik maken van SCIPP en bijkomende training

Dag 15 t/m 21 **GEEN** gebruik maken van SCIPP en bijkomende training

Dag 22 t/m 28 **WEL** gebruik maken van SCIPP en bijkomende training

Je zal tijdens de periode dat u de app **NIET** gebruikt, wel meldingen ontvangen van SCIPP om de app te openen en om de zelfcontrole training uit te voeren. Wij vragen je deze berichten in de periodes dat je de app niet hoeft te gebruiken te **negeren** en de SCIPP app dan niet te openen en de oefeningen niet uit te voeren. Sla het bovenste schema op zodat je het makkelijk terug kan vinden. Via Ethica zal je ook herinneringen ontvangen over de momenten dat je de app SCIPP wel gebruikt, en wanneer niet.

3. Potentiële risico's en ongemakken

Er zijn geen fysieke, juridische of economische risico's verbonden aan je deelname aan deze studie. Je hoeft geen vragen te beantwoorden die je niet wilt beantwoorden. Je deelname is vrijwillig en je kunt op elk gewenst moment stoppen.

4. Vergoeding

Je ontvangt voor deelname aan dit onderzoek geen vergoeding, wel kun je na het deelnemen aan deze studie studiepunten krijgen via Sona systems.

5. Vertrouwelijkheid van gegevens

We willen graag jouw informatie gebruiken voor het onderzoek. Zo kunnen we namelijk antwoorden vinden op de vragen van dit onderzoek.

Alles wat je invult en vertelt blijft geheim. Je gegevens krijgen een nummer. Wij doen er alles aan jouw privacy zo goed mogelijk te beschermen, er wordt op geen enkele wijze vertrouwelijke informatie of persoonsgegevens van of over je naar buiten gebracht waardoor iemand je zal herkennen.

Uitsluitend ten behoeve van het onderzoek zullen de verzamelde onderzoeksgegevens worden gedeeld met Universiteit Twente, gevestigd in Nederland. Voordat onze onderzoeksgegevens naar buiten gebracht worden, worden je gegevens zoveel mogelijk geanonimiseerd en worden pseudoniemen gebruikt. De formulieren en andere documenten die in het kader van deze studie worden gemaakt of verzameld, worden opgeslagen op een beveiligde digitale omgeving van de Universiteit Twente en op de beveiligde (versleutelde) gegevensdragers van de onderzoekers. De onderzoeksgegevens worden bewaard voor een periode van 3 jaar. Uiterlijk na het verstrijken van deze termijn zullen de gegevens worden verwijderd of worden geanonimiseerd zodat ze niet meer te herleiden zijn tot een persoon.

We vragen je wel je e-mail adres door te geven zodat wij contact met je op kunnen nemen over het onderzoek mocht er bijvoorbeeld iets misgaan. Ook gebruiken we

dit e-mail adres om af en toe te polsen hoe het met je gaat. Deze gegevens zullen anoniem worden verwerkt zodat je data niet aan je e-mail adres gekoppeld kan worden.

Tot slot is dit onderzoek beoordeeld en goedgekeurd door de ethische commissie van de faculteit BMS (domain Humanities & Social Sciences).

6. Als je niet mee wilt doen of wilt stoppen

Deelname aan dit onderzoek is geheel vrijwillig. Jij kunt als deelnemer je medewerking aan het onderzoek ten allen tijde stoppen, of weigeren dat je gegevens voor het onderzoek mogen worden gebruikt, zonder opgave van redenen. Het stopzetten van deelname heeft geen nadelige gevolgen voor jou.

Als je tijdens het onderzoek besluit om te stoppen, zullen de gegevens die je reeds hebt verstrekt tot het moment van intrekking van de toestemming in het onderzoek gebruikt worden.

Wil je stoppen met het onderzoek, of heb je vragen en/of klachten? Neem dan contact op met de onderzoeksleiders

Onderzoeksleider: Brigit Beukeveld

E-mail: b.m.beukeveld@student.utwente.nl

Onderzoeksleider: Emma Simons

E-Mail: e.m.simons@student.utwente.nl

Voor bezwaren met betrekking tot de opzet en of uitvoering van het onderzoek kan jij je ook wenden tot de Secretaris van de Ethische Commissie van de faculteit Behavioural, Management and Social Sciences. Indien je specifieke vragen hebt over de omgang met persoonsgegevens kun je deze ook richten aan de

Functionaris Gegevensbescherming van de UT door een mail te sturen naar dpo@utwente.nl.

Tot slot heb je bij deelname het recht een verzoek tot inzage, wijziging, verwijdering of aanpassing van je gegevens te doen bij de onderzoeksleider.

7. Hoe doe ik mee?

Je kunt eerst rustig nadenken over het onderzoek. Wil je mee doen? Dan vragen wij je aan te melden via Sona systems.

Wij hopen dat je mee wilt doen met dit onderzoek. Heb je nog vragen? Stel ze aan Brigit of Emma.

Hartelijk bedankt,

Brigit Beukeveld & Emma Simons

(Msc studenten aan de Universiteit Twente)