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FACULTY OF SOCIAL AND BEHAVIOURAL SCIENCES

MASTER THESIS

LIFE IS LIKE A CAMERA:
A STUDY OF VISUAL IMAGERY ON DEPRESSION AND SELF-ESTEEM

CLINICAL AND HEALTH PSYCHOLOGY 2015-2016

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SUMMARY

In healthy individuals, positive emotional memories are more likely to be recalled from first-person perspective (Berntsen & Rubin, 2006), while third-person perspective is more likely to be adopted in individuals suffering from depression (Kuyken & Howell, 2006; Lemogne et al., 2006). The present study examined whether the vantage perspective does indeed differ for healthy and dysphoric individuals. Also the possibility that self-photographs ('selfies') might similarly be equivalent as a third-person perspective and associated with depression, and self-esteem, is explored.

Part two of this study was a plot feasibility project, to assess if the Narrative Clip can be useful as an imagery-perspective manipulation for depressed individuals. We examined if the photographs taken from the Narrative Clip led to greater reliving, and was more appealing for the participants. A mixed sample of undergraduate students and community members (N = 47) conducted self-report measures of depression, self-esteem, and took 30 photographs from both vantage perspectives while wearing the Narrative Clip.

Results reveal that healthy participants indeed relive more first-person perspective memories. In contrast, mild dysphoric participants did not relive more third-person perspective memories. A significant relationship between the usage of selfies and mild dysphoric symptoms, and self-esteem was not found. Results of part two of the study reveal that participants did not find photographs from the Narrative Clip to lead to more reliving, and compared with the two vantage perspective points, not more appealing.

We speculate about the findings of these results and discuss the potential enhancements for the Narrative Clip. The limitations of the present study, as well as the implications for future research are discussed.

FOREWORD OR ACKNOWLEDGEMENTS

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INDEX

Summary……..…….……..……..…….....2

Foreword / Acknowledgements…….…….…….…….……3

Introduction……...……..5

Hypotheses……10

Method…….…….……..11

3.1. Type of Research……..……...……..…….……11

3.2. Participants……...……11

3.3. Measures……..……12

3.4. Materials……...……13

3.5. Procedure……..……..……..……14

3.6. Manipulations……..……15

3.7. Statistical Analyses…….16

Results……..……..16

Discussion…….…….……22

Limitations……..…….…….……26

Conclusion……..…..…….…….…….26

References……...…...……27

Appendixes……..…….……..33

A: Locations Photographs……...……33

B: PHQ-9……...……..34

C: GAD-7……..……..……35

D: RSES……..……36

E: Registration form……37

F: Questions follow-up……39

INTRODUCTION

"What I like about photographs is that they capture a moment that's gone forever, impossible to reproduce" – Karl Lagerfeld.

Photographs, like memories, represent moments of time or episodic events of our lives that have gone by. Yet not everyone remembers the original vantage point taken by a photograph or memory. There are generally two different vantage perspectives from which memories can be recalled and photographs can be taken from; a first-person (field) perspective and a third-person (observer) perspective. A first-person perspective means that an individual remembers the event from his/her own original point of view (e.g. seeing through their own eyes). In contrast, remembering the event from a third-person perspective, an individual sees himself or herself in the event (e.g., they see themselves from the perspective as an external observer). In general, first-person perspective occurs more frequently than third-person perspective when individuals are recalling a memory (Nigro & Neisser, 1983; Rice & Rubin, 2011).

MEMORIES FROM A FIRST-PERSON PERSPECTIVE

The vantage perspective from which a memory is recalled can impact the qualities of the memory experience. Research has shown that memories from the first-person perspective are more vivid, contain higher levels of affect, and are associated with a greater sense of reliving the event (Berntsen & Rubin, 2006; Nigro & Neisser, 1983). Also, first-person memories tend to be more more recent, and richer in emotional information compared to third-person perspective memories (McIsaac & Eich, 2002; D'Argembeau, Comblain, & Van der Linden, 2003). Similar effects for rich emotional content for memories where found in the study of autobiographical memories from Talarico, LaBar, and Rubin (2004). Ratings of emotional intensity of a memory were a more consistent predictor, and positively associated with a first-person perspective in examining autobiographical memories (Talarico, LaBar, & Rubin, 2004). Shifting or manipulating vantage perspectives can also create corresponding shifts in the qualities associated with a memory (Berntsen & Rubin, 2006b; Robinson & Swanson, 1993; Williams & Moulds, 2008). Specifically, Robinson and Swanson (1993) found that shifting from first to third-person perspective leads to a decrease of the participant's emotional reaction to the memory. An increase of the emotional reactions of the participants from shifting from first to third-person perspective did not happen. Not only emotional reactions of the individuals differs

after shifting from first to third-person perspective, but also the qualities, such as intensity and visual clarity of reliving the memory (Berntsen & Rubin, 2006). Regarding effects on mood, using first-person perspective increased positive mood when imagining positive events, whereas shifting to a third-person perspective led to reductions in positive mood (Holmes, Coughtrey, & Connor, 2008).

MEMORIES FROM A THIRD-PERSON PERSPECTIVE

In contrast to the first-person vantage perspective, third-person memories have been associated with avoidance and may function to minimize the emotional, physiological, and even physical pain in traumatic events (McNamara, Benson, McGeeney, Brown, & Albert, 2005; McIsaac & Eich, 2004; Williams & Moulds, 2007). For example, Williams and Moulds (2007) found that individuals with elevated depression symptoms reported greater detachment and lack of 'reliving' the memory of the event when participants were retrieving intrusive memories from a third-person perspective. Relatedly, McNamara et al. (2005) found that when chronic physical pain participants recalled memories of a pain experience, from a third-person vantage perspective, they reported less intense pain in contrast to similar pain experience from a first-person perspective. McIsaac and Eich (2004) suggest that adapting a third-person perspective helps from reliving a traumatic event, and it even may serve as a cognitive strategy to avoid reliving the anxiety coherent with the trauma. Wilson and Ross (2003) are consistent with this point of view; stating that third-person perspective might be emotionally adaptive to individuals. It allows them to face the trauma the have experienced, and it may be easier for these individuals to detach themselves without enduring the pain of psychologically reliving the traumatic event. Still, more research is needed to conclude if a third-person perspective might be emotionally adaptive as a cognitive strategy, to avoid reliving the trauma in the long term.

In sum, taking a third-person perspective seems to be associated with lesser mood impact, lesser reliving emotional, physiological, and even physical pain in traumatic events, and lesser sensory information, and more overlooking the broader meaning of an event (Berntsen & Rubin, 2006; Hung & Mukhopadhyay, 2012; Libby et al., 2005; McNamara et al., 2005; McIsaac & Eich, 2004; Sanitioso; 2008; Williams & Moulds, 2007).

VANTAGE POINT PERSPECTIVES IN RELATION WITH DEPRESSION

In healthy individuals, positive emotional memories are more likely to be recalled from first-person perspective (Berntsen & Rubin, 2006), while third-person perspective is more likely to be adopted in individuals suffering from PTSD, anxiety, social phobia, and depression (McIsaac & Eich, 2004; Terry & Horton, 2007-2008; Wells, Clark, & Ahmad, 1998; Williams & Moulds, 2007). Focussing on depression, even when individuals overcome depression, there still is a connection between recalling fewer positive first-person perspective memories. Bergouignan et al. (2008) found that even formerly depressed participants recalled more positive memories from the third-person perspective in comparison with the control group. And, according to Werner-Seidler and Moulds (2011;2012) these positive memories are less vivid and less emotionally intense. Similarly, findings are reported in a study of Lemogne et al. (2006) in which depressed participants recalled more positive memories from a third-person perspective. Here the participants were given an episodic autobiographical memory task to retrieve positive and negative memories. The depressed participants were more likely to retrieve positive memories from the third-person perspective than non-depressed controls (Lemogne et al., 2006). The same results were reported in the study of Kuyken and Howell (2006), autobiographical memories are more likely to be remembered from third-person perspective in a depressed population compared to the non-depressed control group. Research, which includes students with dysphoric symptoms, leads to the same conclusion; third-person perspective is more likely to be adopted within these students for more positive autobiographical memories (Nelis, Debeer, Holmes, & Raes, 2013). Finally, within dysphoric students a third-person perspective is more common than first-person perspective in the study of Williams and Moulds (2007).

Taken together, the above-mentioned studies support the notion that depression is associated with a third-person perspective and that this association can have an impact on people's daily life. How can we override this perspective and bend it into a first-person perspective vantage point, hence positive emotional memories are more likely to be recalled from first-person perspective? In addition, healthy individuals improve their moods due to memory recalling from the first-person perspective. **The current aim of this investigation will be that healthy individuals relive more strongly memories from a first-person vantage perspective point. While the second hypothesis predicts that**

individuals with dysphoric symptoms relive more third-person perspective memories.

SELF-ESTEEM, DEPRESSION, AND 'SELFIES'

"Let me take a selfie" is not only a song but is also a common used phrase among teens and students. The term selfie is so popular that is was chosen to be the word of the year 2013 in Netherlands (NOS, 2013) and also Oxford Dictionaries named selfie as the word of the year (Brumfield, 2013). According to Oxford Dictionaries official definition of the word is: *"A photograph that one has taken of oneself, typically one taken with a smartphone or webcam and uploaded to a social media website"*.

Making selfies, where is the harm in that? According to known research selfies could implicate different outcomes for an individual's self-esteem. Self-esteem refers to an individual positive and negative evaluation of his own worth as a person (Trzesniewski, Donnellan, & Robins, 2003). Blades (2014) reports that individuals who takes selfies on a regularly basis, 60% indicates levels of low self-esteem, where only 13% said they felt 'confident in my own skin'. Varnali and Toker (2015) takes it one step further, not only take individuals with low self-esteem more selfies, but they also fulfil their self-esteem needs by posting selfies on social network sites. A Body Image survey under teenage girls reveals something unexpected. Here 65% of the teenage girls say that seeing their selfies actually boost their confidence (Dahl, 2014).

While there is no research on the relationship between selfies and self-esteem related with depression, a lot of previous research had shown that self-esteem is related to depression. The debate is still ongoing whether low-levels of self-esteem predicts (e.g., a risk factor is for) depression (Beck, 1967; Orth, Robins, & Roberts, 2008; Metalsky, Joiner, Hardin, & Abramson, 1993), a consequence is (Coyne, Gallo, Klinkman, & Calarco, 1998; Shahar & Davidson, 2003), or that depression and self-esteem share a large variance between them (Watson, Suls, & Haig, 2002), we can safely assume that there is a link between these two constructs. While there is no research known on the relationship between selfies and self-esteem related with depression, we would argue that selfies would be an equivalent of the third-person perspective (e.g., like seeing yourself through the eyes of a bystander). Depression is associated with a third-person perspective; hence could it be that individuals with depressive symptoms report lower levels of self-esteem in relation to how many selfies they take? **The third hypothesis we will be investigating if there is**

any difference in recalling vantage perspectives for participants with high vs. low self-esteem. In addition, is a relationship present between recalling vantage perspectives in participants with low self-esteem and individuals with dysphoric symptoms? At last, Alblooshi (2015) found in his master thesis that individuals with higher self-esteem takes more selfies of themselves than individuals with low self-esteem, we will replicate this finding: we expect a positive relationship between participant's self-esteem and the amount of taken selfies. In addition, we anticipate a positive relationship between individuals with dysphoric symptoms and selfie usage, adjusting for self-esteem.

POTENTIAL THERAPEUTIC VALUE

As stated above, individuals with depression tend to recall more third-person perspective memories, where more positive memories are being recalled in healthy individuals from a first-person perspective. How can we address this to the depressed individuals to help them to recalling more from the first-person perspective to ease their burden? A solution can be found in the emerging technologies, which have led to small wearable cameras. These cameras have been shown to improve autobiographical memory recall, and even dietary habits of individuals (Browne et al., 2011; O'Laughin, Cullen, McGoldrick et al., 2013). Some research has been done about the use of imagery-perspective manipulation, where depressed individuals benefit from generating positive imagery from a first-person perspective, helping them reducing their depressive symptoms (Blackwell & Holmes, 2010; Lang, Blackwell, Harmer, Davison, & Holmes, 2012). Murphy, Barnard, Terry, Carthery-Goulart and Holmes (2011) studied these effects in healthy individuals by using SenseCam, a wearable camera, and concluded that it helps increasing levels of happy mood, and reduced levels of sad mood while performing everyday activities.

Part two of this study is a plot feasibility project where we collect images with a small wearable camera, the Narrative Clip. The Narrative Clip is a camera that can be worn on an individual's clothing and programmed to automatically take a photograph at set intervals (e.g., every 1, 10, 30, or 60 seconds) from the first-person perspective. Previous research of Silva, Pinho, Macedo, and Moulin (2013) have demonstrated reviewing photographs from a wearable camera (e.g., SenseCam) improve autobiographical memory recalling. In addition, cognitive functioning may also improve in some groups of healthy individuals after reviewing photographs from a wearable

camera. Still, a number of challenges for using wearable cameras in health research emerge, such as; the positioning of the camera on an individual, and the poor quality of the photographs of the camera in areas in a dark environment with poor lighting (Doherty et al., 2012; Kerr et al., 2013). **In order to investigate if the Narrative Clip can be a useful imagery-perspective manipulation like the effects of SenseCam wearable camera, the fifth and last hypothesis will predict that participants will more likely choose the Narrative Clip photograph because it reminds them the most of the location they visited and it appeals to them the most.** We hypothesize this because wearable cameras automatically record photographs from a first-person perspective without requiring an intervention or attention from the researcher to the individual. Hereby, we argue that the photographs from the Narrative Clip will come across from a more natural viewpoint for the individual, and hence, will be more appealing and reminds them the most of the location they visited.

HYPOTHESES

As noted above, the current aim of this investigation will be that healthy individuals relive more strongly memories from a first-person vantage perspective point. While the second hypothesis predicts that individuals with dysphoric symptoms relive more third-person perspective memories. The third hypothesis consisted of three sub-hypotheses. In hypothesis 3a we will be investigating if there is any difference in recalling vantage perspectives for participants with high vs. low self-esteem. In addition, hypothesis 3b we are expecting a relationship between recalling vantage perspectives in participants with low self-esteem and individuals with dysphoric symptoms? Hypothesis 3c was based on the outcomes of the master thesis of Alblooshi (2015) that individuals with higher self-esteem takes more selfies of themselves than individuals with low self-esteem, we will replicate this finding: we expect a positive relationship between participant's self-esteem and the amount of taken selfies. In addition, we anticipate a positive relationship between individuals with dysphoric symptoms and selfie usage, adjusting for self-esteem. The last hypothesis we investigate if the Narrative Clip can be a useful imagery-perspective manipulation, we predict that participants will more likely choose the Narrative Clip photograph because it reminds them the most of the location they visited and it appeals to them the most.

METHOD

3.1. TYPE OF RESEARCH

The current project consisted of two parts: an experimental study with a follow-up and a proof of concept feasibility pilot study. The study was designed as a two-part study, where in the first part participants were being asked to fill in questionnaires, and rating their mood on 15 different locations (see Appendix A). On these locations participants took photographs in first and third-person perspective while wearing the Narrative Clip. A week later during follow-up the participants were asked to complete the same questionnaires again and rate the photographs (for a more comprehensive overview see procedure below). This research has been granted permission by the ethics committee of the Faculty of Social Sciences of Utrecht University.

The second part of the study was a plot feasibility project where the researcher collected data with the Narrative Clip. In the fall of 2015 the researcher wore the Narrative clip for two months collecting photographs for another pilot study. After collecting data the researcher rated the photographs from 1 (negative) to 3 (positive) in different categories (i.e. work, social, daily routine, leisure, and other). The outcomes for this part of study will not be disclosed here since the research is still ongoing.

3.2. PARTICIPANTS

A mixed sample of 53 college students and community members participated in the study for course credit (in the case of enrolled students) or received an entry into a draw for one of two gift cards. From 53 participants, 47 participants were included into the final analysis due to errors with the exclusion criteria, i.e. alcohol consumption, or suicide ideation (n = 3), or missing data (n = 2), or incorrectly taken photographs (n = 1). Thirty-one females and 16 males with a mean age of 23.98 (SD = 8.36) were included in the final analyses. An independent samples t test was used to compare gender and age to all participants. The t test was non-significant, $t(45) = 1.350$, $p < .184$, indicating there was no difference between age and gender in the sample.

In terms of education, 42.6% had a University degree (bachelor's or candidates), 29.8% had a degree in Senior General Secondary Education, 23.4% had a University of Professional Education degree, and 4.3% completed master's or a PhD degree.

3.3. MEASURES

Mood scale. The mood scale is a single question used to rate mood for each location participants visited. The mood question was as follow: ”*Please indicate what rating you would give your mood right now on this location”* The mood scale was specifically developed for this study and was scored on a 5-point Likert scale ranging from -2 (very negative) to 2 (very positive).

Patient Health Questionnaire 9 (PHQ-9; Kroenke, Spitzer, & Williams, 2001). The PHQ-9 is a screening questionnaire for depression, which contains nine questions about the symptoms of major depressive disorder (MDD). For this study the Dutch version on the PHQ-9 was used to measure participants' MDD symptoms (see Appendix B). Each of the nine items of the PHQ-9 refers to a situation in the past two weeks, and can be scored on a 4-point Likert-scale ranging from 1 (not at all) to 4 (almost every day). An example of an item is: "*Trouble falling or staying asleep, or sleeping too much*?" Total scores range from 0 to 27, with higher scores indicating greater severity of symptoms of MDD. Cut-off scores of 5, 10, 15 and 20 are regarded as thresholds for mild, moderate, moderately severe, and severe depression. The validity of a Dutch version of the PHQ-9 has been tested and showed a high degree of internal consistency with a Cronbach's alpha of 0.88 (Zuithoff et al., 2010). Cronbach's alpha in the current sample was .56 at baseline, and at follow-up .53, which can be considered non-adequate for research purposes. According to Nunnally and Bernstein (1994) a threshold of .7 and above is required for research purposes.

Generalized Anxiety Disorder 7 (GAD-7; Spitzer, Kroenke, Williams, & Löwe, 2006). The GAD-7 is a self-report questionnaire to evaluate the presence of symptoms of generalized anxiety. For this study the Dutch version of the GAD-7 was administered (see Appendix C). The GAD-7 contains seven items, each of those items refers to a situation in the past two weeks, and can be scored on a 4-point Likert-scale ranging from 1 (not at all) to 4 (almost every day). An example of an item is: "*Not being able to stop or control worrying?"* Total scores range from 0 to 21, with higher scores indicating greater severity of anxiety symptoms. Total scores can be categorized into four groups: 1) minimal/no anxiety (a score of 0-4), 2) mild (a score of 5-9), 3) moderate (a score of 10-14), or 4) severe GAD (a score of 15-21). The reliability of the Dutch web-based GAD-7 was .86, and the convergent validity was .82 (Donker, van Straten, Marks, & Cuijpers, 2011).

Cronbach's alpha in the current sample was .68 at baseline, and .65 at follow-up, which can be considered non-adequate for research purposes. According to Nunnally and Bernstein, (1994), a threshold of .7 and above is required for research purposes.

Rosenberg's Self-esteem Scale (RSES; (Rosenberg, 1965). The Rosenberg's Self-esteem Scale (RSES) is a widely used questionnaire for measuring self-esteem. For this study, the Dutch version of the RSES was used (Franck, de Raedt, Barbez, & Rosseel, 2008; see Appendix D). The RSES contains 10 positive and negative statements answered on a 4-point Likert-scale from 1 (strongly agree) to 4 (strongly disagree). An example of positive item is: "*I take a positive attitude toward myself*" A negative item from the RSES is: "*I feel I do not have much to be proud of"* Scores range from 0 to 30, with higher scores reflecting higher self-esteem. For this study scores below 21 were indicated as low self-esteem, scores between 21 and 25 as normal self-esteem, and a score of 25 and more as high self-esteem. The Dutch RSES has high congruent validity, as well as high internal consistency with a Cronbach's alpha of .86 (Franck et al., 2008). The reliability of the RSES is studied throughout numerous varieties of cultures, describing alpha reliabilities from .72 till .90 (Gray-Little, Williams & Hancock, 1997). Cronbach's alpha in the current sample was .78 at baseline, and .81 at follow-up, which can be considered adequate for research (Nunnally & Bernstein, 1994

The Ambiguous Scenarios Test relevant for Depressed Mood version II (AST-D-II; Rohrbacher & Reinecke, 2014), a 15-item self-report measure of interpretation bias and the Worry Behaviours Inventory (WBI; Mahoney, Newby, Sanders, Williams, & Andrews, in press), an 18-item self-report measure of anxiety behaviours, were also administered. Data were collected for the purposes of another study and are not reported here.

3.4. MATERIALS

Mobile phone. The photographs for vantage perspectives were taken on a Motorola XT1068 mobile phone. For the first-person perspective the participants used the eight-megapixel camera on the back in landscape mode. Third-person perspective was shot in portrait mode with the two megapixel-camera on the front of the mobile phone.

Narrative Clip. The Narrative Clip is a small, wearable, five-megapixel camera. The Narrative Clip is worn on a participant's clothing and programmed to automatically take a

photograph at set intervals (e.g., every 1, 10, 30, or 60 seconds) from the first-person perspective. For this study the interval was set on 10 seconds.

3.5. PROCEDURE

Participants were recruited via advertisements and flyers posted across the campus of Utrecht University, and via the following websites: proefbunny.nl, and Facebook (Universiteit Utrecht betaalde experimenten). Students enrolled in the Masters of Clinical and Health Psychology program were ineligible to participate due to pre-existing relationships between the researchers and the fellow master students. All study questionnaires and procedures were in Dutch.

Potential participants initiated the screening process by electing to visit the Study Website ('Qualtrics'). Here the participants could read information about the study, provided informed consent, and needed to complete preliminary questions regarding inclusion/exclusion criteria (e.g., age range from 18 to 65, history of bipolar disorder/psychosis, current substance abuse, severity of depression and/or anxiety, and suicide ideation). Participants were ineligible to participate in the study when they did not meet the inclusion criteria and received an automated message that they were not suitable for participation in the study. This message contained additional information about appropriate resources to receive mental guidance for their (psychological) problems. Participants who did meet the inclusion criteria completed a battery of self-report measures.

In the next stage of the study the researchers explained the walk visiting 15 different locations through the campus of Utrecht University. Next, the researchers explained the mood scale, how the photographs should be taken and in which mode, the duration of the trip, and at last the researcher attached the Narrative Clip to the participant's jacket. Participants were instructed to maintain a neutral face whilst taking both photographs. They were not allowed to smile or make funny faces photographing their selves in third-person perspective. This was necessary due to the facial feedback hypothesis. This hypothesis explains how facial movement can influence a person's emotional experience. For example, a person who is forced to smile will eventually enjoy himself more (Strack, Martin & Stepper, 1988). At last, the following measures were noted down on a registration form (see Appendix E): participant number, weather, which researcher will accompany the participant, and the baseline of the mood of the participant.

During the walk the visited locations were crossed off on the registration form, and the mood of the participant on each location before taking the photographs was written down. Any irregularities were noted down as well. After completing the walking and photography stage of the study, the Narrative Clip and mobile phone was returned to the researcher, after which they both returned to the lab where the participant was thanked for participation in the first part of the study. The participant was then contacted by e-mail one week later with a link to access a survey for the follow-up study.

3.6 MANIPULATIONS

Counterbalancing was used at both phases of the study as a means to reduce any chances of the order in which vantage perspective the photographs were taken or any other factor that could influence the results. During the walk the first half of the participants took the first photograph from a first-person perspective followed by third-person perspective and vice versa. Counterbalance has also been implemented in part two and three of the follow-up study.

ONE WEEK FOLLOW-UP

One week after completing the first stage of the study participants received a link to the study website. Here, participants were being asked additional questions about any memory about the locations, recall vantage perspective, and a question about making of selfies of themselves (see Appendix F). Next, the participants completed the same self-report measures reported above once more to control for changes that might have occurred over the past week.

In the next stage of the study, participants viewed and rated their 30 photographs in first-person and third-person perspective. First, the photograph was shown for 8 seconds. Second, the participant rated the shown photograph on a 5-point Likert scale from 1 (very negative) to 5 (very positive): *"Please rate how you currently feel after viewing the photograph?"* Third, to recall the participant's vantage perspective the following item on a 5-point Likert scale from 1 (very weak) to 5 (very strong) was asked: *"Please rate how much you felt like you were 'back in the moment or reliving the moment' while viewing the photograph?"*

In part three of the follow-up the participants compared the vantage perspective photographs with the Narrative Clip images. First, the participant chooses which

perspective or Narrative Clip image he/she likes the most: "*Which type of photograph do you like the most, the Narrative Clip image, first-person perspective or third-person perspective?"* And second: "*Which kind of perspective reminds you the most of the locations where you took the photographs, the Narrative Clip image, first-person perspective or third-person perspective?"*

Lastly, additional questions were being displayed to the participants about participating in other studies, summary results and if they participated for credit hours or gift voucher.

3.7. STATISTICAL ANALYSES

All analyses were performed in 'The Statistical Package of the Social Sciences' (SPSS) version 22.0.0. Significance testing of group differences regarding demographic data and baseline measurements were conducted using analysis of variance and where the variables consist of nominal data. Several hypotheses were addressed by using, independent sample *t* tests, paired samples *t* tests, a one-way between groups analysis of variance (ANOVA), and bivariate Pearson's correlations, partial correlations, Friedman two-way ANOVA, and Wilcoxon Signed Rank. All data was analysed at a α =.05, unless it is stated otherwise.

RESULTS

SAMPLE CHARACTERISTICS

Descriptive statistics for the primary measures of the participants are presented in Table 1. The score of the participants on the PHQ-9 depression questionnaire indicated that they did not suffer from depression. On the GAD-7 anxiety questionnaire participants obtained minimal levels of anxiety. All participants scored a normal level of self-esteem on the RSES self-esteem questionnaire. Selfie usage under the participants showed a mean of 3.23 *(SD = 1.26)* of how many selfies they took of themselves. Fifteen participants (31.9%) took a selfie less than once per month, and 15 participants once or several times per month (31.9%). Descriptives for the primary measures of the participants are presented in Table 1.

From the 47 participants, 17 (36.2%) did not experience a memory of the study activities at follow-up (M = 1.98; SD = 2.32). When the memory of the study came to mind, 23 (62.2%) participants felt generally positive, 13 (35.12%) neutral, and one (2.7%) participant felt very positive. Nineteen participants (40.43%) recalled largely first-person

perspective, 15 (31.92%) largely third-person perspective, seven (14.89%) completely first-person perspective and six participants (12.77%) recalled both perspectives equally when they experienced the memory of the study.

Table 1.

Baseline Scores for Primary Measures

Measure	M	SD	Min-max
PHQ-9	2.98	2.10	0-9
GAD-7	2.70	2.01	0-7
RSES	22.55	3.66	15-30

Note. N = 47.

RELIVING VANTAGE PERSPECTIVE POINTS

For answering the primary hypothesis; photographs will be relived more strongly from a first-person vantage perspective point, a paired samples *t*-test was used to compare all mean differences scores to the first-person perspective (M= 50.28; SD = 8.45) and third-person perspective (M= 47.30; SD = 8.60) averaged across the locations. On average, participants relived more strongly from the first-person perspective after viewing the photographs than they did for the third-person perspective. This difference was statistically significant, $t(46) = 2.693$, $p = 0.01$.

DYSPHORIC SYMPTOMS AND VANTAGE PERSPECTIVE POINTS

This hypothesis predicted that individuals with mild dysphoric symptoms relive more third-person perspective memories than first-person perspective memories. Mild dysphoric participants (≥ 5 on the PHQ-9) were first selected and the ratings of reliving across the two vantage perspectives were compared.

First, we examined which vantage perspective point came to mind when the participants with no dysphoric and mild dysphoric symptoms recalled the study activities at follow-up. The descriptives for the participants with no dysphoric symptoms and the

mild dysphoric symptoms for recalling vantage perspective points of the study activities are presented in Table 2.

Table 2.

PHQ-9 scores on Vantage Perspective Points Recalling Study Activities

	No dysphoric symptoms (N=37)			Mild dysphoric symptoms (N=10)		
Perspective	N	M	SD	N	M	SD
First-person	22	1.86	1.42	4	5.75	.96
Blended	5	2.40	1.14	1	5.00	.
Third-person	10	2.60	1.17	5	6.60	1.52

Note. N total = 47.

A one-way between groups analysis of variance (ANOVA) was used to investigate if recalling vantage perspective points from the study activities at follow-up differ between the participants with no dysphoric symptoms and with mild dysphoric symptoms. The ANOVA was not statistically significant, indicating that recalling vantage perspective from the study activities did not differ between participants with no vs mild dysphoric symptoms, F (2, 44) = 2.51, p = .093.

Next, to inquire if the hypothesis is correct that indeed participants with mild dysphoric symptoms relive more third-person perspective memories after viewing the photographs, a one-way between groups analysis of variance (ANOVA) was used to test this. The participants with no dysphoric symptoms relive on mean average .23 (SD = .54) more first-person perspective memories compared to the mild dysphoric symptoms participants (M = .13; SD = .35), although the difference was not statistically significant, F (1, 45) = .208, p = .65. Indicating that participants with mild dysphoric symptoms did not relive more third-person perspective memories than participants with no dysphoric symptoms. See Figure 1 for a more illustrated look between reliving vantage perspective points and participants with mild vs. no dysphoric symptoms.

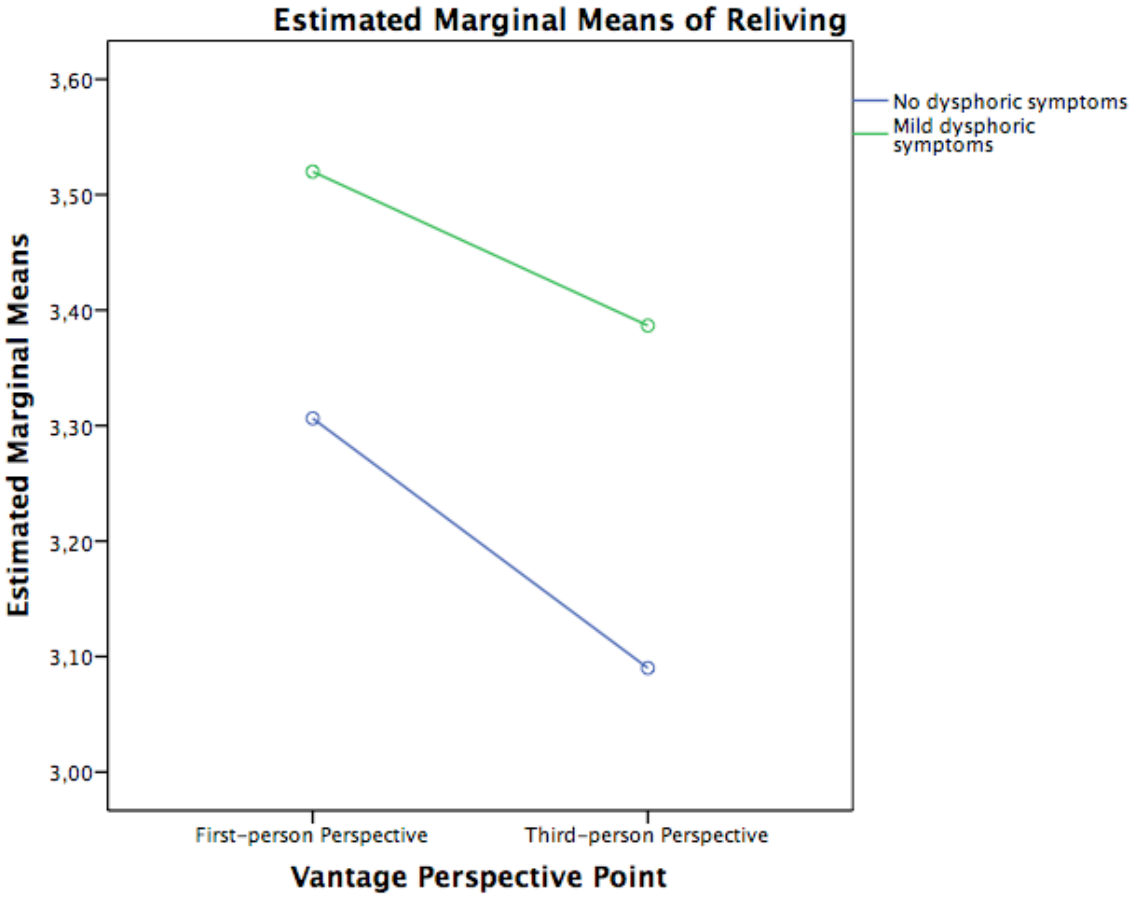

Figure 1. The non-significant effect of vantage perspective points and no vs. mild dysphoric symptoms on reliving.

VANTAGE PERSPECTIVE POINTS, SELF-ESTEEM, AND DEPRESSION

The third hypothesis consisted of three sub-hypotheses. Hypothesis 3a investigated if there was any difference in reliving vantage perspective points for participants with low vs. high self-esteem. While hypothesis 3b examined if there was a relationship between reliving vantage perspectives points in participants with low vs. high self-esteem and mild dysphoric symptoms. And at last, hypothesis 3c investigated if there was a relationship between a participant's self-esteem and the amount of selfies taken.

First we examined the global self-esteem scores that were measured with the Dutch RSES. Scores ranged from 15 up to 30 (M = 22.55; SD = 3.66) indicating normal levels self-esteem. According to Rosenberg (1979) a global self-esteem scores may range from 0 to 30. Scores between 15 and 25 are considered within normal range; scores below 15 suggest low self-esteem. Scores higher than 25 indicate high self-esteem.

Unfortunately, none of the participants had a low self-esteem on the Dutch RSES, due to this the lack of *N* hypotheses 3a and 3b could not be investigated. Given this data limitation, we investigated if there was a simple relationship between self-esteem scores and participants with mild dysphoric symptoms. For answering this simplified hypothesis, a bivariate Pearson's correlation coefficient was calculated to assess the size and direction between self-esteem and mild-dysphoric symptoms. The bivariate correlation between these two variables was non-significant, $r(8) = -.190$, $p = .599$.

To answer the research question 3c; will there be a relationship between participant's self-esteem and the amount of taken selfies, a bivariate Pearson's correlation coefficient (*r*) was calculated. First, we examined the descriptives of the amount of taken selfies of the participants. The mean average of participants on how often do they make selfies of their selves was $M = 3.23$ ($SD = 1.26$). One (2.1%) of the 47 participants never take a selfie, 15 participants (31.9%) did this less than once per month, 15 participants (31.9%) did this once or several times per month, six participants (12.8%) takes once per week a selfie of their selves, eight participants (17.0%) takes several times per week a selfie, and at last, two participants (4.3%) takes everyday a selfie of their selves. An independent sample *t* test was used to compare outcomes on the selfie variable between males ($M = 3.19$; $SD = 1.38$) and females ($M = 3.26$; $SD = 1.21$). The *t* test was non-significant, $t(45) = -.181$, $p = .857$, indicating there was no difference between males and females on how many selfies they take of themselves.

Next, selfie usage was calculated between participants' scores on RSES self-esteem questionnaire. To assess the size and direction of the linear relationship between participants' self-esteem scores and the usage of selfies, a bivariate Pearson's correlation coefficient (*r)* was calculated. The bivariate correlation between these two variables was statistically non-significant, $r(45) = .056$, $p = .707$. Finally, we examined the relationship between the participants' scores on the PHQ-9 and selfie usage, after controlling for self-esteem with a partial correlation. The partial correlation was statistically non-significant, $r(44) = -.267$, $p = .073$.

RELIVING AND APPEAL OF THE NARRATIVE CLIP, AND VANTAGE PERSPECTIVE POINTS

The last research question contained two hypotheses. First we addressed which vantage perspective point or Narrative clip photograph was more appealing for the participants, and next, which kind of vantage perspective point photograph or Narrative clip

photograph was relived for the participants.

A Friedman two-way ANOVA was preformed to assess which vantage perspective photograph or Narrative Clip photograph was more appealing for participants. The test indicated that rankings of appeal varied significantly across the vantage perspective points (e.g., first-, third-person perspective or Narrative Clip), $\chi^2 = 11.13$ (corrected for ties), $df = 2$, N- Ties = 33, $p = .004$. Follow-up pairwise comparisons with the Wilcoxon Signed Rank test and a Bonferroni adjusted α .017 indicated that third-person perspective photograph (*Mean Rank* = 2.21) was perceived as significantly more appealing than the Narrative Clip photograph (*Mean Rank* = 1.60), $T = 117$, $z = -3.56$ (corrected for ties), N – Ties = 37, $p = <.001$. Twenty-six participants ranked the third-person perspective photograph as more appealing (Sum of Ranks = 585.00), whilst only 11 ranked the Narrative Clip photograph as more appealing (Sum of Ranks = 117.00). This effect can be described as 'large' according to Cohen (1988), $r = .59$.

The difference between the rankings of more appealing photographs between first-person perspective and Narrative Clip was also statistically significant. Twenty-six participants ranked the photograph form the first-person perspective (*Mean Rank* = 2.19), as more appealing (Sum of Ranks = 477.00) than the photograph from the Narrative Clip (Sum of Ranks = 84.00), $T = 84$, $z = -3.54$ (corrected for ties), N – Ties = 33, $p = <.001$. This effect can be described as 'large', $r = .62$.

The difference between rankings of more appealing photographs between first-, and third-person perspective was statistically non-significant, $T = 433$, $z = -.486$ (corrected for ties), N – Ties = 43, $p = .627$, and effect size was 'small', $r = .07$.

Next, to answer which kind of vantage perspective point photograph or Narrative clip photograph leads to more reliving of the locations for the participants was also answered through a Friedman two-way ANOVA. The test indicated that rankings of reliving varied significantly across the vantage perspective points (e.g., first-, third-person perspective or Narrative Clip), $\chi^2 = 25.41$ (corrected for ties), $df = 2$, N- Ties = 28, $p = <.001$. Follow-up pairwise comparisons with the Wilcoxon Signed Rank test and a Bonferroni adjusted α .17 indicated that a first-person perspective photograph (*Mean Rank* = 2.51) was perceived as significantly higher in ratings of reliving than the Narrative Clip photograph (*Mean Rank* = 1.50), $T = 22$, $z = -4.84$ (corrected for ties), N – Ties = 35, $p = <.001$. Thirty-three participants ranked the first-person perspective photograph higher in ratings of reliving (Sum of Ranks = 608.00), whilst only three ranked the Narrative Clip

photograph as rated high in ratings of reliving (Sum of Ranks = 22.00). This effect can be described as 'large' according to Cohen (1988), r = .82.

The difference between the rankings of reliving from the photographs between third-person perspective and the Narrative Clip was also statistically significant. Twenty-one participants ranked the photograph form the third-person perspective (*Mean Rank* = 1.99), as more reliving (Sum of Ranks = 337.00) than the photograph from the Narrative Clip (Sum of Ranks = 69.00), T = 69, z = -3.074 (corrected for ties), N – Ties = 28, p = <. 001. This effect can be described as 'large', r = .58.

Lastly, the results showed that the difference between rankings of reliving of photographs between first and third-person perspective was not statistically significant, T = 298.50, z = -2.138 (corrected for ties), N – Ties = 43, p = .033, and effect size was 'medium', r = .33.

DISCUSSION

The present study did not only investigate vantage perspective points between dysphoric participants, but also looked at the relationship between these participants and the use of selfies. At last, the study represented a new technology as a pilot feasibility project to investigate if the Narrative Clip can be a useful imagery-perspective manipulation. **Our results reveal that healthy participants indeed relive more first-person perspective memories. In contrast, mild dysphoric participants did not relive more third-person perspective memories. A significant relationship between the usage of selfies and mild dysphoric symptoms, and self-esteem was not found. Results of part two of the study reveal that participants did not find photographs from the Narrative Clip to lead to more reliving, and compared with the two vantage perspective points, not more appealing.**

Consistent with the first main hypothesis, photographs will be relived more strongly from a first-person perspective than from a third-person perspective, was similar with the study of Nigro and Neisser (1983), and Rice and Rubin (2011). When participants recalled these study activities they remembered largely more first-person perspective than third-person perspective, although the difference the vantage perspective points was small. Previous research has shown memories from the first-person perspective are more vivid, contains higher level of affect, and are associated with a greater sense of reliving the event (Bernsten & Rubin, 2006; Nigro & Neisser, 1983).

Unfortunately, the predicted outcome that participants with dysphoric symptoms relive more third-person perspective, did not deliver. While participants with dysphoric symptoms did recall more third-person perspective from the study activities than participants with no dysphoric symptoms, this difference was not significant. We hypothesize that this outcome could be related to the small sample size (N = 10 for participants with dysphoric symptoms) and power of this study. Moreover, although it looked that there was a main effect for reliving the visited locations of the two vantage perspective points for participants with none and mild dysphoric symptoms, still this effect not significant. These results did not replicate previous findings in the literature (McIsaac & Eich, 2004; Kuyken & Howell; 2006; Lemogne et al., 2006; Nelis et al., 2013; Terry & Horton, 2007-2008; Wells et al, 1998; Williams & Moulds, 2007). A reason why we didn't replicate previous findings could be due to the fact that participants were not given the opportunity to state which vantage perspective came to mind when they looked back on the visited locations. Although the participants had been counterbalanced (e.g., half of the participants first took a photo from a first-person perspective and than from a third-person perspective, and vice versa. This sequence was also carried out at follow-up), the participants did not have the option to indicate which memory came to mind when they looked back on each location they visited. Instead they first saw a photograph from the first-person or from third-person perspective. Future research should investigate this possibility by first addressing from each location the naturally occurred perspective and followed by the photograph of the chosen perspective. One other possibility could be the chosen locations for this study. Some locations were well known for the undergraduate students like the cafeterias, the examination rooms, and the bus route through campus, while other locations are less known like the David the Wied building, and the park with a pond. Could it be that participants remember the more known locations than the less known locations, as if they relive stronger the well known locations? We could argue that participants memory about the familiar locations are richer in emotional information since they know it so well, and that could be the reason they relive more from the first-person perspective. Another possibility is that vantage perspective point may be influenced by other individuals. This study was in and around the campus of Utrecht University with other students, teachers and community members walking by heading to class, work, etc. The work of Clark (2001) and Clark and Wells (1995) suggest that perspective plays a role in how someone appears to other individuals.

Although this research is based on socially anxious individuals, our research did not exclude these individuals. According to Clark and Wells (1995) socially anxious individuals construct more third-person perspective due to how they look to others, and so vantage perspective may vary during encoding of the location with present individuals. While our study did account for both vantage perspectives for each location, the possibility exists that the locations were non-equivalent in how many other individuals were present at the time the photographs were taken. And even looking at the third-person perspective photograph at follow-up and seeing other individuals 'judging' the participant, might have led for the participant to choose the first-person perspective. Future research should investigate the locations and the presence of individuals are present while taking photographs from vantage perspective point and examining the influence of these individuals during retrieval of the vantage perspective points. A final possibility is when seeing oneself from a third-person perspective facilitates unfavourable self-comparisons, such as how the self can be falling short of the more ideal standard participants have created for themselves (Kuyken & Howell, 2006). It begs to question if this is true for the participants in our study, it could be that seeing yourself, and seeing that you are not confident in your own skin, you are more likely to relive the location from a first-person perspective.

The third research question investigated three different hypotheses about low and high self-esteem, mild dysphoric symptoms, and the use of selfies. Unfortunately, hypothesis 3a and 3b could not be investigated due to the lack of low self-esteem in the sample. Given this data limitation we investigated if there was a relationship between self-esteem scores and mild dysphoric symptoms. Where previous research has shown a relationship between depression and self-esteem (Beck, 1967; Coyne et al., 1998; Orth et al., 2008; Watson et al., 2002), the relationship between these two variables was not significant in our study. This was unexpected. A possible explanation is a methodological limitation, hence the lack of participants with low self-esteem. All of the participants had a normal or high self-esteem indicating no variability in the sample. This could be due to the fact that the RSES is a self-report measure. The danger of using self-report measures is that 1) researchers are relying on the honesty of the participants, and 2) contains several potential sources of bias, like selective memory and attribution bias.

The research question 3c; a relationship between participants' self-esteem and the amount of taken selfies, and depression was investigated. While selfies are an indicator of

low self-esteem according to numerous research (Blades, 2014; Peek, 2014; Varnali et al., 2015) We did not find a significant relationship between these variables. Studies investigated self-esteem and the amount Facebook use, found that individuals did not differ from those with low and high self-esteem in posting selfies. It even boosted their self-esteem posting selfies on social media (Forest & Wood, 2012; Grabmeier, 2015). A possibility why this study did not find the relationship could be from not asking how much selfies the participants posts on social media. Since the participants only takes the selfies and did not display them on social media, a control 'safe' setting could be implied for these participants. Also in this research question there was a methodological limitation, the lack of participants with low self-esteem. While this study did not study the effect of posting selfies on social media, future research should attempt to investigate if selfies would be an equivalent of a third-person perspective.

The last research question addressed two research hypotheses. While this last research question was a pilot feasibility project we expected that 1) the Narrative clip photograph would be selected as more appealing compared to the other photographs, and 2) the Narrative clip photograph would lead to higher ratings of reliving compared to the other photographs. The results indicated that most participants found the photographs representing the vantage perspective points more appealing than the Narrative clip photographs. The same results were found for which vantage perspective or Narrative clip photograph reliving the locations. Some research has been done about the use of imagery-perspective manipulation, where depressed individuals benefit from generating positive imagery from a first-person perspective using a wearable camera (Blackwell & Holmes, 2010). We studied is the Narrative clip can be a useful imagery-perspective manipulation, like the effects of the SenseCam camera, which Murphy et al. (2011) used to studied effects in reducing depressive symptoms in healthy individuals. Unfortunately, the participants in this study did not find the photograph of the Narrative clip more appealing and it did not remind them the most of the visited locations. This could be due to the quality of the pictures of the Narrative clip. Most pictures were not clear/sharp, or placed in centre. Like stated above, a number of challenges for using wearable cameras in health research exists like: the positioning of the camera on a participant, and the poor quality of the photographs of the camera in areas in a dark environment with poor lighting (Doherty et al., 2012; Kerr et al., 2013). Our research highlights the previously founded challenges. We could argue that participants are more drawn to a more centred composition of the

locations and clear/sharp photographs. Although we would argue that wearable cameras, such like the Narrative Clip, brings new attributes to the clinical domain, the participants are not reliving the moment of the visited locations more than the other two vantage perspective point. A potential solution for these problems could be to use a higher megapixel camera, and a anti-shock or a stabiliser function for the wearable camera. One major issue of using or wearing a wearable camera in public are the ethics and privacy. An ethical framework has been made for wearable camera research by Kelly et al. (2013), which should serve as a checklist.

LIMITATIONS

Our study has several limitations. For example, an insufficient number of participants had a low self-esteem, score which prevented us from testing the third hypothesis. Another point that needs to be addressed is the dysphoric participants in the sample. The study only contains participants with mild dysphoric symptoms; ideally participants with higher scores on the PHQ-9 would be preferable to compare differences between non-dysphoric and high dysphoric participants. None of the participants were diagnosed using the PHQ-9 with a moderate or moderately severe depression. Since our sample was small for the mild dysphoric symptoms group (N = 10) which may have reduced the power of the study. In addition, Cronbach's alpha of the Dutch version of the PHQ-9 in current sample was .56 at baseline, and .53 at follow-up, indicating a low internal consistency. It could be argued that this finding is due to the non-clinical sample of participants. This could limit the strength of the founded conclusions. The last limitation refers to older memories that are linked to a third-person perspective and recent memories linked to a first-person perspective (e.g., Berntsen & Rubin, 2006). Since participants were only instructed to retrieve memories of study activities that were not recent (recalling was at least older than one week).

CONCLUSION

Withstanding these limitations, the present study did add valuable new knowledge to the literature of the different relationships between vantage perspective points, depression, self-esteem and the use of selfies. The findings show that first-person perspective is common in healthy individuals, but participants with mild dysphoric symptoms did not relive more third-person perspective memories from the study. Next, in contrast of previous research we did not find a significant relationship between self-esteem, dysphoric

symptoms, and selfies. The feasibility project the evidence indicates that Narrative clip technology has potential in imagery-perspective research, but that more work has to been done to make it more appealing and appropriate for research in a clinical sample. Nonetheless, while future is knocking on our doors, it is up to future research to investigate how the Narrative clip can be applied in clinical samples and how imagery-perspective manipulation benefits the clinically depressed populations. Maybe this is a way to capture the moment.

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APPENDIXES

APPENDIX A – LOCATIONS

Number	Place
1	Looking at the stairs and library
2	Upstairs educatorium megatron
3	Hallway educatorium alfa
4	Looking at cantine
5	Overview Ruppert
6	Outside Educatorium ‘jelly beans’
7	Park with pond
8	Park with David de Wied building
9	Overview Educatorium, Unnik
10	Water next to Centrum gebouw noord
11	Uithof, bus route
12	Before I die blackboard/sign, Busstop
13	Student building complex Cambridge
14	Overview ditch with blue and red building
15	Cantine Langeveld

APPENDIX B - PHQ-9 DUTCH

Hieronder volgt een aantal uitspraken over de afgelopen 14 dagen. Kunt u aangeven in hoeverre deze op u van toepassing zijn? Hoe vaak heeft u gedurende de afgelopen 14 dagen last gehad van één of meer van de volgende problemen? (Omcirkel het antwoord dat voor u van toepassing is)

Antwoordcategorieën:
Helemaal geen last (0), Meerdere dagen (1), Meer dan de helft van de dagen (2), Bijna elke dag (3)

Hoe vaak heeft u gedurende de laatste 14 dagen last gehad van één of meer van de volgende problemen?		Helemaal geen last	Meerdere dagen	Meer dan de helft van de dagen	Bijna elke dag
1.	Weinig interesse of plezier in activiteiten	0	1	2	3
2.	U somber, terneergeslagen of hopeloos voelen	0	1	2	3
3.	Moeite heeft met inslapen, moeilijk doorslapen of teveel slapen	0	1	2	3
4.	U moe voelen of gebrek aan energie hebben	0	1	2	3
5.	Weinig eetlust of overmatig eten	0	1	2	3
6.	Ontevreden zijn over uzelf en het gevoel hebben dat u een mislukkeling bent of dat u en/of uw familie teleurgesteld heeft	0	1	2	3
7.	Moeite heeft met concentreren, bijvoorbeeld om de krant te lezen of om tv te kijken	0	1	2	3
8.	Langzaam bewegen of spreken dat anderen mensen dit opgemerkt hebben? Of het tegenovergestelde: zo druk/gejaagd of rusteloos dat u veel meer bewoog dan gebruikelijk	0	1	2	3
9.	De gedachte dat u beter dood zou kunnen zijn of denken aan manieren om uzelf iets aan te doen	0	1	2	3

APPENDIX C - GAD-7 DUTCH

Hieronder volgt een aantal uitspraken over de afgelopen 14 dagen. Kunt u aangeven in hoeverre deze op u van toepassing zijn? Hoe vaak heeft u gedurende de afgelopen 14 dagen last gehad van de volgende problemen? (Omcirkel het antwoord dat voor u van toepassing is)

Antwoordcategorieën:
Helemaal niet (0), Meerdere dagen (1), Meer dan de helft van de dagen (2), Bijna elke dag (3)

		Helemaal niet	Meerdere dagen	Meer dan helft dagen	Bijna elke dag
1.	Zich zenuwachtig, ongemakkeklijk of gespannen voelen	0	1	2	3
2.	Niet in staat zijn om te stoppen met piekeren of om controle te krijgen over het piekeren	0	1	2	3
3.	Zich teveel zorgen maken over verschillende dingen	0	1	2	3
4.	Moeite om u in te ontspannen	0	1	2	3
5.	Zo rusteloos zijn dat het moeilijk is om stil te zitten	0	1	2	3
6.	Snel geirriteerd of prikkelbaar zijn	0	1	2	3
7.	Bang zijn dat er iets afschuwelijks zou kunnen gebeuren	0	1	2	3

APPENDIX D - RSES DUTCH

Instructies: hierna volgen 10 beweringen over uw algemene gevoelens ten opzichte van uzelf. Geef aan of deze bewering voor u Helemaal Akkoord (3), Akoord (2), Niet Akkoord (1) of Helemaal Niet Akkoord (0) klopt.

		Helemaal akkoord 3	Akkoord 2	Niet akkoord 1	Helemaal niet akkoord 0
1.	Over het algemeen ben ik tevreden met mezelf				
2.	Bij momenten denk ik dat ik helemaal niet deug				
3.	Ik heb het gevoel dat ik een aantal goede kwaliteiten heb				
4.	Ik ben in staat dingen even goed te doen als de meeste andere mensen				
5.	Ik heb het gevoel dat ik niet veel heb om trots op te zijn.				
6.	Het is ongetwijfeld zo dat ik me bij momenten nutteloos voel.				
7.	Ik heb het gevoel dat ik een waardevol iemand ben, minstens evenwaardig aan anderen				
8.	Ik wou dat ik meer respect voor mezelf kon opbrengen				
9.	Al met al ben ik geneigd mezelf een mislukkeling te voelen				
10.	Ik neem een postieve houding aan ten opzichte van mezelf				

APPENDIX E- REGISTRATION FORM
Participant nummer:

Locatie	**Stemming van 1 tot 5**	**Bijzonderheden: Zijn er extra foto's gemaakt?**
1. Looking at the stairs and library		
Field		
Observer/Selfie		
2. Upstairs educatorium megatron		
Field		
Observer/selfie		
3. Hallway educatorium alfa		
Field		
Observer/selfie		
4. Looking at cantine		
Field		
Observer/selfie		
5. Overview Ruppert		
Field		
Observer		
6. Outside Educatorium 'jelly beans'		
Field		
Observer/selfie		
7. Park with pond		
Field		
Observer/selfie		
8. Park with David de Wied building		
Field		
Observer/selfie		

9. Overview Educatorium, Unnik		
Field		
Observer/selfie		
10. Water next to Centrum gebouw		
Field		
Observer/selfie		
11. Uithof, bus route		
Field		
Observer/selfie		
12. Before I die blackboard/sign		
Field		
Observer/selfie		
13. Building complex Cambridge		
Field		
Observer/selfie		
14. Overview blue and red building		
Field		
Observer/selfie		
15. Cantine Langeveld		
Field		
Observer/selfie		

APPENDIX F - ADDITIONAL QUESTIONS AT FOLLOW-UP

One week after completing the first stage of the study participants received a link to the study website. Here, participants were being asked additional questions about any memory about the locations, recall vantage perspective, and a selfie question. *"In the past week, did you think and/or have an memory about the locations you photographed for this study? If so, how often did you experience this?"* and *"Please indicate how you generally felt when the memory came to mind on a 5 point Likert scale from very negative to very positive?"*

Another question was used to recall vantage perspective through the following item: "*Sometimes we "see" a memory from a first-person perspective. In a first-person memory you see the event from the same visual perspective that you originally did; in other words, in your memory you are looking out at your surroundings through your own eyes. However, at other times we "see" a memory from a third-person perspective. In a third-person memory you see the event from an observer's visual perspective; in other words, in your memory you can actually see yourself, as well as your surroundings. Using the following scale, please indicate the perspective that you generally had when you experienced this memory in the past week"* Responses of the participants were coded on a 1 (completely first-person) to a 5 (completely third-person) Likert scale.

Next question addresses how much the participant makes a selfie. *"A selfie is a self-portrait photograph that one has taken of oneself, typically taken with a smartphone. How often do you make a selfie of yourself?"* Responses of participants were coded on a 1 (never) to 6 (every day) Likert scale. After these additional questions the participants completed self-report measures reported above once more to control for changes that might have occurred over the past week.