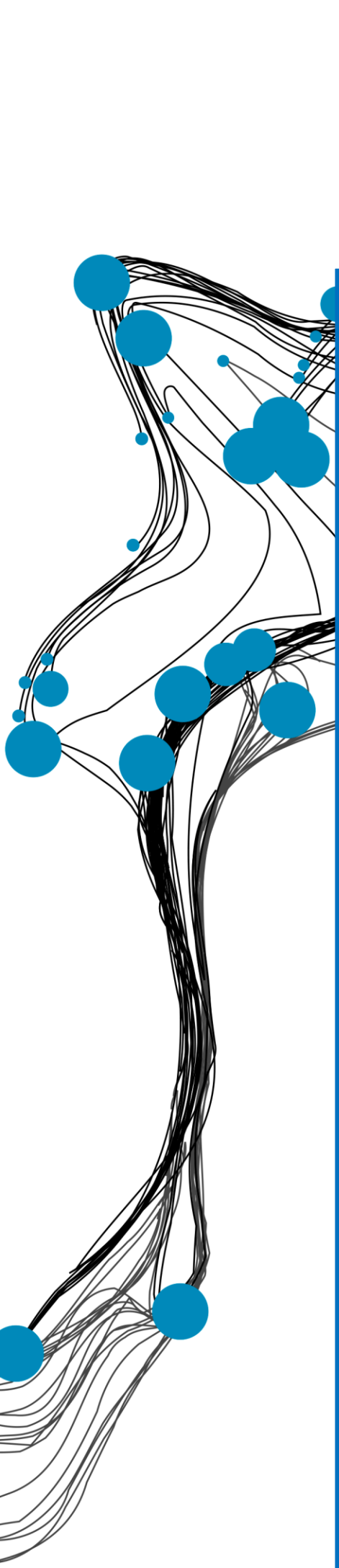

# ENHANCING RESILIENCE, WELLBEING AND OPTIMISM THROUGH NARRATIVE IMAGINATION OF THE FUTURE AND THE INTERRELATIONSHIP OF THE CONCEPTS WITH COPING.

***Bachelor Thesis***

***Maria Schröder***

*Faculty of Behavioural Management and Social Sciences - BMS*

*Positive Psychology and Technology*

*First Advisor:*
Jochem M. Goldberg, Msc.

*Second Advisor:*
Anneke Sools, Dr.

UNIVERSITY OF TWENTE.

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*Abstract*

The present study explores two different assumptions. First, the role of future letters as means to enhance resilience, wellbeing and optimism is investigated. The future holds a huge amount of opportunities and uncertainties, and is often regarded as demanding. Confronting the future with a positive picture in mind makes individuals mentally flexible and decreases individual stress levels when facing the future. The effective dealing with uncertainty and stress signifies key aspects of wellbeing, optimism and resilience. Within the literature, the narrative imagination technique of writing letters from the future involves the capacity to imagine the future and is often shown to increase levels of optimism and wellbeing. However, the evidence concerning the imaginative capacity and resilience is only theoretically given.

Second, the concept of coping and its relation with resilience, wellbeing and optimism is examined. High scores on the three concepts are assumed to relate to high scores on problem focused coping and to low scores on avoidance coping. According to literature, coping as an important factor regarding effective stress management and is clearly related to the three main concepts. Coping is assumed to serve as underlying factor regarding the amount of resilience, wellbeing and optimism which is displayed by an individual. Clarifying the relationship leads to new insights and to a better understanding of the three concepts.

A two week intervention was constructed to investigate these two assumptions. In the beginning, respondents had to answer questionnaires, measuring resilience (BRS), wellbeing (MHC-SF) and optimism (LOT-R). After that, respondents were assigned to a condition; experimental group one, experimental group two or control group. The first experimental group contained the writing of four future letters, the second group involves the writing of one future letter, and the control group included the writing of one past letter. In the third phase, respondents had to answer the questionnaires again; additionally a questionnaire measuring coping style (UCL) was given to the respondents.

Future letters do not account for increases in resilience, wellbeing and optimism, as revealed by the statistical analysis. The future letter conditions do not lead to higher score increases compared to the past letter condition. The first assumption has to be rejected. Although the assigned condition does not account for increases, additional analysis revealed that optimism scores increased during the study. Levels of optimism are affected by future as well as by past letters. The increase in scores, only found for optimism, indicates that optimism is more likely

to increase compared to wellbeing and resilience. The high dropout rates during the study can be hold as an explanation for the falsification of the first assumption. Due to technical and procedural problems, more than the half of the respondents had to be excluded from analysis. A huger sample size per condition increases the likelihood to find significant differences between the three intervention groups.

The second assumption is partially verified. Respondents with high scores on resilience, wellbeing and/ or optimism also display high scores on problem focused coping. Although low scores on avoidance coping are not found, low scores on passive reaction coping are found, capturing aspects of avoidance. This indicates that high amounts of resilience, wellbeing and optimism are linked to a higher tendency to use problem focused coping. The tendency to use passive reaction coping is, on the other hand, lower when high amounts of resilience, wellbeing and optimism are present. High scores on the three measures predict the use of more adequate coping strategies.

Future research should further investigate the impact of future imagination on resilience, wellbeing and optimism and should additionally explore the relation of the concepts with different coping strategies.

*Keywords:* future imagination, impact, resilience, wellbeing, optimism, interrelationship with coping

***Abbreviations:***

BRS – Brief Resilience Scale
MHC-SF – Mental Health Continuum Short Form
LOT-R – revised Life Orientation Test
UCL - Utrechtse Copinglijst
PP – Positive Psychology
PTSD – Post Traumatic Stress Disorder
BPS – best possible self

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## *1. Introduction*

### *1.1. Dual aims*

The current study includes two different aims. The first target of the study is to investigate the opportunity to enhance resilience, wellbeing and optimism through the intervention *"letters from the future"*. Within the academic literature, imagination of the future through written letters is regarded as a possibility to enhance resilience, wellbeing and optimism (Sools & Mooren, 2012; Sools, Tromp, & Mooren, 2015; Carver & Scheier; 2014; Meevissen, Peters, & Alberts, 2011; Peters, Flink, Boersma, & Linton, 2010).

The second aim of the current study can be seen in the attempt to investigate the relationship which is assumed to persist between coping and optimism and between coping and resilience as well as between coping and wellbeing. The specification of the relation can enhance the understanding of resilience, wellbeing and optimism. By this is meant that coping can possibly serve as underlying factor which can declare the amount of resilience, wellbeing and optimism that is displayed by an individual.

### 1.2. *Need for resilience and wellbeing*

The necessity of resilience and wellbeing can be found in the current human condition. Humans living in the present situation are likely to experience huge amounts of uncertainty and stress during their lifespan (Sools & Mooren, 2012; Wu et al., 2013). Steward (cited by Sools and Mooren, 2012) states that a shift in the daily concerns of humans has taken place. Humans are no longer confronted with local and immediate issues. Rather individuals have to assimilate to changes within an increased time and space continuum. The general future and the variety of possibilities the future holds can be described as containing more complexity. The future can additionally be seen as source for the extent of uncertainty which is being faced (Sools & Mooren, 2012). The huge proportion of individuals which undergo stress within their lifespan gets illustrated through a study concerning the probability of experiencing traumatic events and post traumatic stress disorder (PTSD). The study, conducted within the Dutch population, revealed that about 80.7 percent experienced at least one traumatic event and that 7.4 percent of the population suffers from PTSD (de Vries & Olff, 2009). Mentionable is that the experience of traumatic events does not automatically lead to suffering from traumata, such as PTSD (Wu et al., 2013; de Vries & Olff, 2009). Two important features concerning the maintaining of normal human functioning when confronted with traumatic life events, stress, crisis, and change can be seen in the concepts of resilience

and wellbeing. For one, resilience as a trait negotiates with respect to social change and uncertainty; and it contributes to the maintaining of functioning when uncertainty and change are faced (Sools & Mooren, 2012). Secondly, resilience can be understood as concept consisting of several factors which protect individuals from the negative appraisal of stressors and which influences the stress process on several phases (Fletcher & Sarkar, 2013). These characteristics of resilience are indicating its interlinkage with wellbeing. In fact, the application of resilience is related to better psychological wellbeing (Burns, Anstey, & Windsor, 2011). Resilience, due to its characteristics, may be seen as an important factor concerning the preservation of psychological wellbeing when facing crisis and change.

### *1.3. Conceptualisations of resilience and wellbeing*

Resilience may be suitable construct to serve as an explanation for the maintaining of normal human functioning, which appears furthermore to influence wellbeing as well (Sools & Mooren, 2012; Burns et al., 2011). Commonly resilience is defined as a "capacity [and as a] dynamic process of adaptively overcoming stress and adversity" (Wu et al., 2013, p.1). Additionally, resilience consists of various factors that enhance personal abilities and protect individuals from the negative consequences of severe and mild stressors (Fletcher & Sarkar, 2013). Resilience can, for example, be influential on the individual's estimation regarding the stressor or the stressful event. Or, it can interfere on the meta-cognitions as response to the emotions experienced; and on the selection of different coping strategies (Fletcher & Sarkar, 2013). Another addition can be found in the definition given by Wu et al. (2013) which states that humans maintain normal physiological and psychological functioning when displaying resilience. Beyond that, resilience concerns "not just recovery but growth and strengthening from adversity" as well (Campbell-Sills, Cohan, & Stein, 2006, p.595). Next to the above mentioned, Sools and Mooren (2012) have indicated that individual varieties and objective circumstances can account for the differences existing in the extent to which people "need, want and can be resilient" (p. 205). The concept of resilience thus includes several different aspects which all cover more or less aspects off effective dealings with stressors and stressful events.

Adversity and positive adaptation appear to be of importance regarding the general definition of resilience. In fact, most definitions of resilience are based on these two concepts (Fletcher & Sarkar, 2013). Adversity, on the one hand refers to the negative life circumstances that are associated with difficulties respecting the adjustment towards a

stressful event. The amount of resilience an individual is likely to express when facing adverse events depends on the contextual severity of the event (Fletcher & Sarkar, 2013). This means that mild adversity, like everyday hassles will elicit lesser amounts of resilience compared to strong adversity, like extensive stress. The second concept, positive adaptation, refers on the other hand to the behaviourally manifested competence in the face of stress or to the success at meeting the developmental tasks of life (Fletcher & Sarkar, 2013; Campbell-Sills et al., 2006).

As already indicated, wellbeing next to resilience is an important determinant concerning the maintaining of normal human functioning. Respecting the definition of wellbeing it can be stated that it is integrated in the definition of health. Health is defined as the "state of complete physical, mental and social wellbeing and not merely [as] the absence of disease or infirmity" (Salvador-Carulla, Lucas, Ayuso-Mateos, & Miret, 2014, p.53). The World Health Organization (2014) defines psychological wellbeing furthermore as a contribution to mental health. For one, wellbeing can enhance mental health through the realization that one can cope with normal stressors. Apart from that, wellbeing can lead to an increase in mental health through the expansion of the own abilities. Wellbeing as a construct can be understood as an essential part of our ability to think, enjoy life, and interact with other humans (World Health organization, 2014). Individuals displaying higher amounts of wellbeing are in addition also regarded as working more productively and are seen as contributing to the social community, compared to individuals scoring low on wellbeing (Lamers, Westerhof, Bohlmeijer, Ten Klooster, & Keyes, 2011a). The concept of wellbeing thus reflects on the health status of an individual, on an individual's ability to interact with the environment and on its ability to enjoy life.

The primary concepts concerning the current study can be found in the notion of wellbeing and resilience. For this, the concept of wellbeing which is integrated in the definition of health will be used. Wellbeing shall be seen as a state of complete physical, psychological and social welfare. Besides, wellbeing shall also be regarded as a construct enabling individuals to interact with the environment and with other humans and as construct that enables living a satisfied life. Respecting the definition of resilience, a combination of the above mentioned definitions shall be used. Resilience shall be understood as a trait as well as a process which differs among individuals and which enhances personal abilities to recover and grow in the face of adversity and stress. It shall additionally be regarded as protecting individuals against

the negative consequences of mild and serve stressors, as enhancing normal human functioning in times of stress; and as enhancing wellbeing.

### *1.4. The role of optimism and mastery*

Two essential interrelated concepts regarding the primary concepts of the current study can be seen in the notions of optimism and mastery. Mastery functions as a developmental factor within the concept of resilience (Wu et al., 2013). The early mastery of stressors and the related degree of control over a stressor or stressful event can be concerned as crucial when regarding the learned stress response (Wu et al., 2013). The early mastery over a stressor can lead to a phenomenon called stress inoculation. Stress inoculation can be described as a form of "immunity" (Wu et al., 2013, p.4) or "toughening" (Campbell-Sills et al., 2006, p. 595) to later stressors. This toughening or immunity is explainable through the experiences of early moderate stress levels which may enhance the amount of resilience to later comparable stressors (Wu et al., 2013; Campbell-Sills et al., 2006). The phenomenon of increases in resilience through stress inoculation can further be explained through the fact that an adequate estimation of the stressor has taken place or due to adequate coping strategies which were used (Wu et al., 2013; Fletcher & Sarkar, 2013). Within the concept of wellbeing mastery can be understood as a cognitive component which refers to the "strong self-referent belief in ones capacity to influence the environment and bring about desired outcomes" (Burns et al., 2011).

Turning next to the notion of optimism can be stated that it can be characterized as an emotion of feeling better, as a state of achieving more in times of adversity and as an expectation of positive results (Carver & Scheier, 2014; Scheier & Carver, 1992). Combined with the concept of resilience can be declared that optimism functions as psychological factor. Optimism correlates with displaying higher amounts of resilience towards stressful or negative life events (Meevissen et. al., 2011; Peters et al., 2010). In addition, Kleiman et al. (2015) found some support for a stress-resilience model of optimism. Several aspects of optimism, such as positive expectations and sense of invulnerability were found to be effective regarding the reduced impact of stress on mental illnesses. Optimism functions as moderator or buffer towards the development of depression and anxiety (Kleiman et al., 2015). Concerning the role of optimism with respect to wellbeing can be stated that optimists are also regarded as containing better psychological health (Wu et al., 2013; Carver & Scheier, 2014; Peters et al., 2010). For example, optimism is related to lesser amounts of

distress during times of adversity, and can be seen as a significant factor concerning changes in perceived stress, depression, loneliness and social support (Scheier & Carver, 1992). Besides that, optimists are less likely to worry about plausible threats to their wellbeing (Kleiman et al., 2015).

In general, optimism leads to a decreased automatic stress response, to adequate coping and to a faster recovery times after facing the stressor (Wu et al., 2013). The tendency to use problem focused coping strategies is regarded as being higher in optimists compared to pessimists. On the other hand, the tendency to use avoidance coping strategies is regarded as being lower in optimists compared to pessimists (Scheier & Carver, 1992). Another key feature of optimism concerns the notions of expectations, which underlie the decision to conduct certain behaviours. Optimists are seen as having generally higher expectations of success, which furthermore implies that they will have a higher tendency to strive for their goals compared to pessimists (Scheier & Carver, 1992; Carver & Scheier, 2014). In addition, optimists view negative life events as local and unstable and as attributable to external factors. These attitudes respecting negative life events can be found within pessimists in the reverse pattern - pessimists view negative life events as stable, global and long-lasting and attribute those events to internal factors (Meevissen et al., 2011).

### *1.5. Interrelationship with coping*

As already suggested above is the notion of coping interrelated with the concepts of resilience, wellbeing and optimism. As indicated by Lazarus (cited by Stratta et al., 2015) coping can be perceived as a "cognitive and behavioural process by which individuals manage specific external and/or internal [challenges] or [threats] that are appraised as taxing or exceeding the resources of the person". In general, coping can be regarded as a relevant mediating factor, which intervenes on the relation between the stressor and the possible outcomes (Stratta et al., 2015). Rutter (cited by Beasley, Thompson, & Davidson, 2003) additionally states that coping styles can be understood as a protective factor which may be developed during life. Coping, as protective factor, can be enhanced through the successful dealing with adversity and turning points (Beasley et al., 2003). The perception of a stressful event and its managing can thus be affected through different coping styles (Beasley et al., 2003).

Combined with the concept of resilience, it can be stated that coping and resilience are distinct but interrelated. In fact, both concepts place emphasis on possible responses to stress. Although, the emphasis is slightly different. Whereas the concept of coping indicates a set of cognitive and behaviourally strategies which aim at the managing of stressful events, refers resilience to outcomes in times of stress (Stratta et al., 2015). In general, resilience can be seen as the outcome of adequate coping. For further clarification, an individual who used coping skills is not necessarily resilient as well. Not all coping skills are even effective concerning the outcome, and if the outcome is not favourable resilience will not be displayed (Stratta et al., 2015). Usually, it is assumed that resilient individuals make use of active, problem focused coping strategies. This assumption was found to be true in a study conducted by Campbell-Sills et al. (2006), which reveals that the task oriented coping strategies of resilient individuals are shown to be effective regarding the recovery from several types of stressful events. This assumption is in addition strengthened through the study conducted by Stratta et al. (2015), which states that task oriented coping is related to resilience. Resilient individuals are found to have higher scores on problem focused coping strategies compared to vulnerable individuals. Furthermore is emotion focused coping, a form of avoidance coping, found to correlate with low amounts of resilience (Stratta et al., 2015).

Turning now to the combination of optimism and coping can be stated that optimists with their generally higher expectations of success will track their goals more functional and will also have a higher tendency to use active, problem focused coping strategies (Pietrowsky & Mikutta, 2012; Scheier & Carver, 1992). Moreover, optimists are regarded as having a lower tendency to use avoidance coping strategies, such as emotion focused coping, compared to pessimists (Scheier & Carver, 1992). The assumption of the higher tendencies to use problem focused coping strategies gets also illustrated through a study which found that optimists, compared to pessimists, engage more in constructive problem solving (Carver & Scheier, 2014).

The concept of coping and especially the concept of problem focussed and avoidance focussed coping seem to relate to optimism as well as to resilience. In addition, the concept of resilience appears to influence the amount of wellbeing. This may also be seen as an indication for the fact that wellbeing is enhanced through adequate coping as well. The primary variables of the current study, resilience and wellbeing shall be broadened by the concepts of optimism and coping.

### *1.6. Future letters*

As indicated in the beginning, the study makes use of an intervention focussing on the future. The letters from the future technique can be described be as a health promotion instrument. The technique is derived from the positive psychology movement; more precisely from its sub discipline narrative psychology. The stance of positive psychology (PP) can be seen as an approach to study the "psychology of wellbeing" (Salvador-Carulla et al., 2014, p.56). A key principle within PP is illustrated by the notion of "build what's strong [instead of] fix what's wrong" (Pietrowsky & Mikutta, 2012, p.1067). The sub of discipline narrative psychology also focusses on the enhancement of wellbeing, but mainly emphasises on storytelling (Sools, Tromp, & Mooren, 2015). Storytelling is seen as an important indication of human thought and action, for the construction of identity, and for giving meaning to the own life. Furthermore, storytelling implies a powerful way of dealing with crisis and change, which in turn reflects on the enhancement of resilience and wellbeing in difficult times (Sools & Mooren, 2012).

The instrument letters from the future illustrates the opportunity to enhance wellbeing, resilience and optimism. Letters from the future as an imagination method are for example used by Sools and Mooren (2012) to study the influence of an unknown future. Future letters can thus be used to study resilience and wellbeing, due to the fact that the unknown future introduces uncertainty which is faced as being more demanding for individuals who display lesser amounts of resilience. Within their study, Sools and Mooren (2012) state that the capacity to imagine the future involves several relevant aspects concerning the concept of resilience. Imagining the future is, for example, understood as a crucial factor concerning the normal psychological functioning of individuals. It can further be regarded as a strategy to generate different future possibilities; and as an opportunity to evaluate these different possibilities with respect to the own identity (Sools & Mooren, 2012). The enhanced ability to see and think about the futur can serve as a coping strategy which additionally facilitates open mindedness and makes mentally flexible (Sools & Mooren, 2012). The development of this imagination ability is assumed to facilitate the use of resilience in a way that adequate coping mechanisms concerning the complex and uncertain future are invited (Sools & Mooren, 2012).

Optimism, next to resilience and wellbeing can also be enhanced through future imagination. Several studies made use of a future imagination technique called best possible self (BPS). They have indicated that the amount of optimism was temporarily enhanced

(Carver & Scheier, 2014; Meevissen et al., 2011; Peters et al., 2010). The BPS manipulation was more over found effective for increasing wellbeing (Peters et al., 2010). In fact, optimism as an expectation of positive results can be redefined as a positive expectation about the future and about the belief that one will experience positive rather than negative outcomes (Kleiman et al., 2015). Besides, optimism can be characterized by the belief that a stressful present can change towards a better future (Carver & Scheier, 2014). The definition of optimism, incorporating aspects about the future, shall be used within the present study.

### 1.7. *Aims and needs*

In sum, concerning the first aim of the current study, it is assumed that general scores on resilience, wellbeing and optimism will increase through the participation in the intervention "letters from the future". Besides is assumed that a higher frequency of written future letters lead to larger increases in scores on resilience, wellbeing and optimism. Concerning the second aim of the current study, it is assumed that individuals with high scores on resilience, wellbeing and/ or optimism will also display high scores on task oriented coping strategies and low scores on avoidance coping strategies.

The need for the current study can be seen in the fact that empirical evidence is missing concerning the possible effect of future letters on resilience. Whereas evidence suggests that future imagination lead to enhancements in wellbeing and optimism, the relation with resilience are only theoretically examined. Furthermore, the concept of resilience is still debated within the academic literature. As stated, the clarification of the relationship shall lead to a clearer picture not only of resilience, but also of wellbeing and optimism. The observation that not all individuals are suffering from traumas after experience of traumatic events can be seen as additional reason for the current study.

## *2. Method*

### *2.1. Design*

In the present study two different designs were used. For one, concerning the first assumption a between group design was employed. Future letters are assumed to enhance resilience, wellbeing and optimism scores, measured through the Brief Resilience Scale (BRS), the Mental Health Continuum - Short Form (MHC-SF); and the revised Life Orientation Test (LOT-R). In addition is assumed that a higher frequency of future letters will lead to higher

increases in scores. For this aim three different conditions were established; a control group and two experimental groups. The independent variable was condition, with the levels; experimental group one, experimental group two, and control group. The dependent variable was the change in scores on resilience, wellbeing, and optimism before and after the intervention: “letters from the future”.

Secondly, a correlational survey design was used. The second assumption anticipates that high scores on resilience, wellbeing and optimism are also paired to high scores on task oriented coping strategies and to low scores on avoidance coping strategies. The independent variable was the set of scores on resilience, wellbeing and optimism, measured through the BRS, the MHC-SF and the LOT-R. The dependent variable was the interrelated score on coping, measured through the Utrechtse Copinglijst (UCL). Figure 1 illustrates the current study design.

**Figure 1.** The current study design

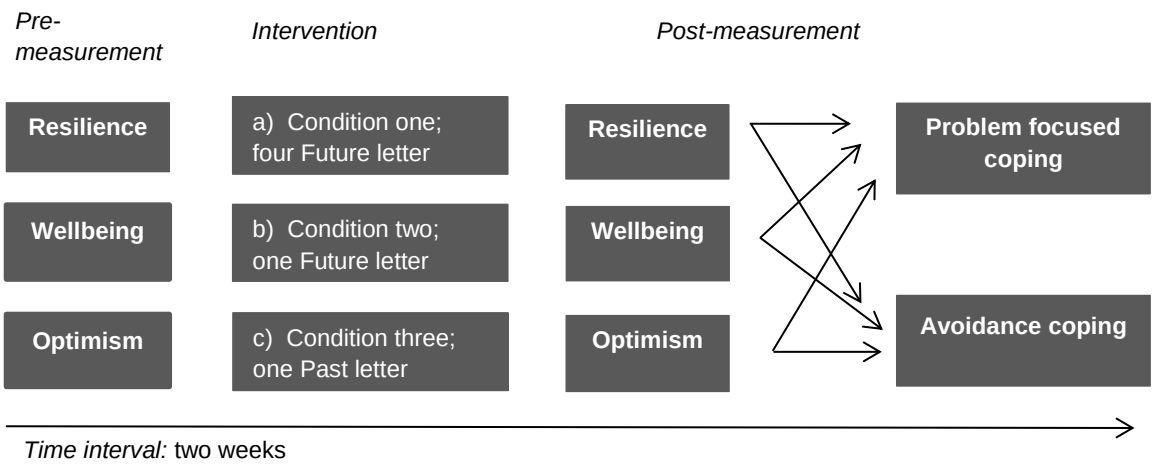


*Figure X.* Illustration of the current design and the anticipated correlations. Resilience, wellbeing and optimism are assumed to increase through participation in the future letter interventions, condition one and two. The past letter intervention, condition three is assumed to have a neutral effect on the three concepts. The past letter intervention functions as control group.

Additionally, a positive correlation between resilience, wellbeing, optimism and problem focused coping and a negative correlation between the three concepts and avoidance coping is assumed to exist.

*2.2. Participants*

In sum, 80 participants with ages ranking from 18 to 65 (*M* = 27.19, *sd* = 10.76) took part in the study. One criterion for participation was good writing and comprehension skills regarding the Dutch language. From the total number of respondents, 26 were male and 53 female. Most of the respondents (*n* = 58) were students, followed by working participants (*n* = 16). One participant reported to be job-seeking, one declared to stay at home due to children; and one stated to be retried. Additionally, three respondents indicated that they were something different from the other five categories.

Concerning the first assumption 49 of the total amount of 80 participants had to be excluded from analysis, due to procedural and technical problems. For the analysis of the first assumption *n* = 31 participants were randomly assigned to one of the three conditions (*n* = 8 in the experimental condition one, *n* = 14 in the experimental condition two, *n* = 9 in the control condition). Within this group of 31 participants 7 were male and 24 female. The ages ranged from 19 to 60 (*M* = 27.16, *sd* = 12.2). Seven of the respondents divided to one of the three conditions reported to already have some experiences with future letters. The amount of letters written by the seven respondents ranged from one to six.

Regarding the second assumption, due to technical defects answers of 46 participants on the post-measurement were not saved, which left n = 34 respondents for analysis of the second assumption. Within this second group of participants 8 were male and 26 female, with ages ranging from 19 to 60 (*M* = 26.68, *sd* = 11.72). Important values concerning the sample are summed up in Table 1.

***Table 1.***
Summary of important sample values.

| | Total sample | Hypothesis one | Hypothesis two |
|---|---|---|---|
| *N* | 80 | 31 | 34 |
| Age (*M*; *SD*) | 18 - 65<br>*M* = 27.19; SD = 10.76 | 19 - 60<br>*M* = 27.16; SD = 12.2 | 19 - 60<br>*M* = 26.68; SD = 11.72 |
| Sex (♂; ♀) | ♂26; ♀53 | ♂7; ♀24 | ♂8; ♀26 |

Note. N = number of cases; M = mean value; SD = standard deviation; ♂ = male; ♀ = female.

### *2.3. Ethical approval*

The study was authorized by the ethics committee of the faculty of Behavioural Management and Social Science of the University of Twente, the Netherlands. Before participation, respondents were briefed about the general aim study setup and signed an informed consent.

### *2.4. Materials*

The online study was arranged using a software tool called Qualtrics. For participation, respondents used their own devices.

#### *2.4.1. Brief Resilience Scale (BRS)*

The Brief Resilience Scale (BRS) invented by Smith et al. (2008) was used to measure the original and most basic meaning of the concept of resilience. Within this scale resilience is conceptualized as recovering or bouncing back from stress (Smith et al., 2008). The scale developed to provide a brief measure of resilience consists of six statements. Items one, three and five are positively worded, whereas items two, four and six are negatively worded. Within this self-measurement questionnaire participants are asked to indicate their agreement regarding the statements on a 5-point Likert scale ranging from 1 = *strongly disagree* to 5 = *strongly agree* (Smith et al., 2008; Tansey et al., 2015). One positively worded example statement is "*I usually come through difficult times with little trouble*", and one negatively worded example statement is "*I tend to take a long time to get over set-backs in my life*" (The Ohio State University, n.d.). The overall resilience score is calculated through reverse coding of negatively formulated items. After that, responses to items are summed up and divided by the total amount of items (Smith et al., 2008).

The BRS has good internal consistency with Cronbach´s alpha ranging from .80 to .91 and good test-retest reliability ranging from .62 to .69 for one and three months after the first measurement (Smith et al., 2008; Tansey et al., 2015). Additionally, good convergent validity was established for the BRS. The BRS was positively correlated with optimism, active coping and with other resilient measures. Furthermore, a relationship between the BRS and resilient resources was found. The BRS might mediate the effect of resilient resources on health outcomes, such as optimism, social support and active coping (Smith et al., 2008).

### *2.4.2. Mental Health Continuum - Short Form (MHC-SF)*

Wellbeing was measured using the Mental Health Continuum - Short Form (MHC-SF). The MHC-SF is a brief, self-report questionnaire which assesses emotional, psychological, and social wellbeing. The focus lies only on aspects of wellbeing. The MHC-SF was developed due to the fact that a questionnaire was missing which encompasses the three basic dimensions of mental health. These three dimensions, covered by the MHC-SF are: wellbeing, effective functioning regarding the individual life, and effective functioning concerning the community life (Lamers et al., 2011a).

The MHC-SF contains 14 items about several feelings of wellbeing. Three of the items cover emotional wellbeing, six items treat psychological wellbeing, and five items deal with social wellbeing. Participants are asked to indicate the rate of different feelings occurred in the past month on a six point Likert scale. The scale ranges from *never, once or twice a month, about once a week, two or three times a week, almost every day*, to *every day*. An example item with respect to emotional wellbeing is "*in the past month, how often did you feel happy*", an example item of the psychological wellbeing scale is "*in the past month, how often did you feel that you like most parts of your personality*", and an example item of the social wellbeing scale is "*in the past month, how often did you feel that people are basically good*" (Lamers et al., 2011a). The MHC-SF was translated into Dutch by Lamers, Westerhof, Bohlmeijer, Klooster and Keyes (2011b) and contains good psychometric properties for the Dutch population.

In general regarding the psychometric properties, all items of the MHC-SF had high loadings on their intended factor. The factor loadings ranged from above .56 in the calibration sample to above .53 in the validation sample. Furthermore, the total MHC-SF contains a high internal reliability, with Cronbach's alpha of .89. The internal reliability for the subscales emotional and psychological wellbeing is respectively high ($\alpha$ = .83 for emotional wellbeing, $\alpha$ = .89 for psychological wellbeing). The internal reliability for the subscale social wellbeing is adequate ($\alpha$ = .74). Test-retest reliability is moderate, with the largest magnitude of .50 at follow up. Moreover, this moderate test-retest reliability suggested that the MHC-SF is for one, stable over time but also sensitive to change (Lamers et al., 2011a; Lamers et al., 2011b).

### *2.4.3. Life Orientation Test - Revised (LOT-R)*

The revised Life Orientation Test (LOT-R) is one of the most frequently used measures for dispositional optimism (Chiesi, Galli, Primi, Innocenti Borgi, & Bonacchi, 2013). The original version of the Life Orientation Test was improved by Scheier, Charles and Bridges

(1994). This was done due to the fact that the original version did not consider the mediating role of coping, which appeared to weaken the psychometric properties. The revised version of the LOT consists of ten items. Three of the ten items, items number 1, 4 and 10 are positively worded; and three of the ten items, items number 3, 7 and 9 are negatively worded. The remaining four items, items number 2, 5, 6, and 8 are filler items, which are not taken into account for the calculation of the overall score on optimism (Scheier et al., 1994). An example of a positively worded item is "*in uncertain times I usually expect the best*". An example of a negatively worded item is "*if something can go wrong for me, it will*". During completing this self-report questionnaire, respondents are asked to indicate their extent of agreement for each item on a five point Likert scale. The scale uses response options ranging from 0 = *strongly disagree*, 1 = *disagree*, 2 = *neutral*, 3 = *agree*; to 4 = *strongly agree*. Before calculation of the overall optimism score, negatively worded items are reverse coded. After that, responses to items are summed up (Scheier et al., 1994).

The revised LOT includes good internal consistency with a Cronbach´s alpha of .78 for all six items. Besides, each of the six items appears to add Cronbach´s alpha and item-scale correlations ranging from .43 to .63 indicate that each item measures the same underlying construct. The test-retest correlations for the revised LOT seem to be acceptable, with .68 after four months, .60 for twelve months, .56 for twenty-four months; and .79 after twenty-eight months. The high value of Cronbach´s alpha and the moderate test-retest reliability illustrate that the revised LOT is relatively stable over time (Scheier et al., 1994). Concerning the correlation of the revised version of the LOT with its original version it can be stated that it correlates relatively high. The two versions of the scale are measuring highly similar things (Scheier et al., 1994). Additionally, the six items of the revised LOT include one factor which accounts for 48% of the variance, all items loaded at least .58 on the one factor (Scheier et al., 1994).

### *2.4.4. Utrechtse Copinglijst (UCL)*

The Dutch Utrechtse Copinglijst (UCL) was used to measure several coping strategies if confronted with problems or negative life events. De UCL contains 47 items, which are arranged along seven subscales. The subscales of the UCL are: active tackling, palliative coping, avoidant coping, seeking social support, passive reaction coping, showing emotions, and reassuring thoughts (Turner, Bryant-Waugh, Peveler, & Bucks, 2012). The 47 items are uneven divided along the seven subscales. The active tackling scale makes use of seven items, the palliative coping and the avoidant coping scale includes eight items, the seeking social

support scale uses six items, the passive reaction scale involves seven items, the showing emotion scale uses three items; and the reassuring thoughts scale uses five items. An example item of the active tackling scale is "*to view problems as a challenge*". Additional, three filler items (item 20, 28, and 41) are involved. Each subscale is irrespectively scored; high scores indicate a higher tendency to use the specific coping style when confronted with problems. Respondents are asked to indicate their general response when confronting problems on a four point Likert scale, ranging from *never* to *very often* (Mavroveli, Petrides, Rieffe, & Bakker, 2007).

The internal consistency of the UCL ranges from moderate to high with Cronbach´s alpha scores extending from .63 to .88 for a student population of $n = 164$; and from .65 to .79 for a Dutch population of $n = 168$ (Schreurs & van de Willige, 1988). The highest Cronbach´s alpha values were attained for active tackling ($\alpha = .71$ for the student population; and $\alpha = .78$ for the Dutch population) and seeking social support ($\alpha = .88$ for the student population; and $\alpha = .79$ for the Dutch population) (Schreurs & van de Willige, 1988). The test-retest reliability was found to be reasonably high with scores ranging from .52 to .79 for students after six weeks and from .55 to .74 for the Dutch population after seventeen months. The relatively high test-retest values can be seen as indication for measuring stable features. The subscales of the UCL are generally stable over time (Schreurs & van de Willige, 1988). The UCL is usually completed quickly and is within the Netherlands often used for the purpose of psychological research (Turner et al., 2012).

### *2.5. Procedure*

Before participation, respondents were briefed about the general setup of the study. An email, including the research information sheet (see Appendix A) and the link for the online survey was send to the respondents. Informed consent was given by the participants before the survey started. The study took 14 days. In the beginning, day 1, respondents were asked to complete several questionnaires, including the BRS, the MHC-SF, and the LOT-R. After that, participants were randomly assigned to one of the three conditions: experimental group one, experimental group two, or control group.

Within the experimental group one, respondents were asked to write down four future letters during two weeks. These four letters were spread around day 2 to day 13, *i.e.* respondents were asked to write a letter on day 3, day 6, day 9, and day 12. Experimental group two, was asked to write down one future letter. This letter was dated midway through

the study, at day 7. The control group was asked to write down one past letter. The date for this letter was also placed midway through the study, on day 7. For the instructions regarding the future letter and the past letter, see Appendices B and C.

At the end of the study, day 14, participants were asked to complete the questionnaires a second time. The same questionnaires as the first time were measured. Additionally, the UCL was given to the respondents. Participants assigned to condition two and three received a remembering mail halfway through the study. This mail was sent to remind the participants about the writing of the past or future letter. Respondents assigned to condition 1 received four remembering mails, each time when they had to write a letter.

In general, participants were sampled through convenience sampling and in addition through the use of Sona systems, a software tool for collecting respondents.

### *2.6. Statistical analysis*

Statistical analyses were conducted using a software tool called IBM SPSS Statistics 22.0. The first assumption, regarding the anticipated increase in resilience, wellbeing and optimism via future letters, was tested through the use of one - way ANOVA's and through the Kruskal-Wallis H test. The independent or categorical variable for both statistical tests was condition; with the three levels experimental group 1, experimental group 2; and control group. The dependent variable was change in scores. This was done to investigate the effect of future letters on resilience, wellbeing and optimism per condition and besides that to investigate the relationship between increased scores and frequency of future letter. Additionally, paired sample t-tests were used. Within this t-test, mean values from pre- and post-measurement of the BRS, the MHC-SF and the LOT-R were separately paired. This was done to examine the relationship between pre- and post-measurement in general.

The second assumption, concerning the interrelated role of coping was tested through the use of three separate Linear Regression Analyses. The dependent variable was each time the individual score on the seven subscales of the UCL. The three separate independent variables were the scores on the BRS, measuring resilience; the MHC-SF, measuring wellbeing; and the LOT-R, measuring optimism. The scores of the participants on these three measures were correlated to their individual UCL score.

## *3. Results*

### *3.1. Testing for normal distribution*

Pre- and post-measurement scores on the BRS, the MHC-SF, and the LOT-R were normally distributed as revealed by the Shapiro Wilk test. Furthermore, the test for normal distribution illustrated that changes in scores for the BRS and the MHC-SF were normally distributed as well, whereas changes in scores for the LOT-R were not normally distributed. Concerning the scores on the UCL scales passive reaction coping and showing emotions indicated the Shapiro Wilk test no normal distribution. Linear regression analysis could nevertheless be conducted, due to the central limit theorem. The theorem states that it can be assumed that a sample is normal distributed, if the sample size is huge enough (Moore & McCabe, 2013). The current sample, used for the conduction of linear regression analysis, includes more than thirty cases, which is accepted as being huge enough to expect normal distribution.

### *3.2. Assumption one*

Although procedural and technical problems limited the number of respondents for the two statistical main analyses, the total amount of n = 81 respondents of the pre-measurement were still useful for the calculation of mean scores and standard deviations for the BRS, the MHC-SF and the LOT-R pre-measurement. Table 2 shows the mean scores and standard deviations for the pre- and post-measurement of the BRS, the MHC-SF and the LOT-R.

***Table 2.***

Mean scores and standard deviations for pre- and post-measurement of the BRS, the MHC-SF, and the LOT-R.

| | *N* | | *M* | | *SD* | |
|---|---|---|---|---|---|---|
| | Pre-measure | Post-measure | Pre-measure | Post-measure | Pre-measure | Post-measure |
| BRS | 81 | 35 | 19.4 | 20.6 | 4.4 | 3.6 |
| MHC-SF | 81 | 34 | 4.25 | 4.39 | .63 | .64 |
| LOT-R | 76 | 31 | 14.7 | 16.2 | 3.4 | 3.2 |

Note. BRS = Brief Resilience Scale; MHC-SF = Mental Health Continuum Short Form; LOT-R = revised Life Orientation Test; N = number of cases; M = mean value; SD = standard deviation.

Inconsistent with the first assumption, future letters did not account for changes in scores on the BRS, the MHC-SF, and the LOT-R. The one way ANOVA for change in scores on the BRS and the MHC-SF with the independent variable condition; experimental condition 1, experimental condition 2, and control condition; revealed no significant findings. The same pattern persisted for the LOT-R, which was tested through the use of the Kruskal-Wallis H test, with the independent variable condition and the same three levels. Table 3 shows the results of the one - way ANOVA and the Kruskal-Wallis H test.

***Table 3.***
Results for the one way ANOVA and the nonparametic test.

| | $F^{a}$ / $\chi^{2\,b}$ | *df* | *p* |
|---|---|---|---|
| BRS | .89 | 2, 30 | .42 |
| MHC-SF | 4.13 | 2 | .127 |
| LOT-R | .81 | 2, 29 | .45 |

Note. BRS = Brief Resilience Scale; LOT-R = revised Life Orientation Test; MHC-SF = Mental Health Continuum Short Form; df = degree of freedom; p = significance level.
[a] F-value = test value of one way ANOVA; [b] Chi-Square value = test value of Kruskal-Wallis H test ;

The first hypothesis about the anticipated enhancement of scores on the BRS, the MHC-SF and the LOT-R through the writing of future letters cannot be verified through the current findings. Furthermore, the subpart of the first hypothesis which assumes that a higher frequency of future letters lead to huger changes in scores could not be answered as well. No statements can be done regarding the frequency effect of future, due to the fact that no significant effect concerning the role of future letters was found. The first assumption must be rejected.

Additionally, paired sample T-tests were conducted for the BRS, the MHC-SF, and the LOT-R. Pre- and post-measurement scores were paired for each questionnaire independently. The T-test indicated significant differences between the pre- and post-measurement scores of the LOT-R. For the BRS and the MHC-SF no significant differences were found between pre- and post-measurement. Table 4 illustrates the results of the paired sample t-test.

***Table 4.***

Results of paired sample t-tests for the BRS, the MHC-SF and the LOT-R.

| | *t* | *df* | *p* |
|---|---|---|---|
| BRS | 1.96 | 34 | .058 |
| MHC-SF | -.811 | 33 | .423 |
| LOT-R | -3.61 | 30 | .001*** |

Note. BRS = Brief Resilience Scale; MHC-SF = Mental Health Continuum Short Form; LOT-R = revised Life Orientation Test; t = test-value for t-test; df = degree of freedom; ***p < .001, two-tailed.

Regarding the LOT-R, respondents scored significantly higher in the post- compared to the pre-measurement ($M_2$ = 16.3; $sd_2$ = 3.21; compared to $M_1$ = 14.6; $sd_1$ = 3.54). Higher scores on the LOT-R post-measurement were attained independent of the condition and thus independent of writing about the future or writing about the past.

Concerning the BRS, no significant difference between pre- and post-measurement scores were found ($p$ = .058) but nevertheless can be stated that a trend can be seen. Respondents seemed to score higher on the post- compared to the pre-test ($M_2$ = 20.6; $sd_2$ = 3.65; $M_1$ = 19.9; $sd_1$ = 4.42).

### *3.3 Assumption two*

Scores on the BRS, MHC-SF and LOT-R post-measurement were independently correlated to the scores on the seven UCL subscales. Mean values and standard deviations of the seven UCL scales are summed up in Table 5.

***Table 5.***

Mean values and standard deviations for the UCL scales apart.

| | Utrechtse Copinglijst (UCL) | | | | | | |
|---|---|---|---|---|---|---|---|
| | *active tackling* | *palliative coping* | *avoidant coping* | *seeking social support* | *passive reaction coping* | *showing emotions* | *reassuring thoughts* |
| *M* | 19.6 | 20.7 | 17.2 | 15.5 | 12.9 | 6.5 | 13.5 |
| *SD* | 3.01 | 3.62 | 3.06 | 4.11 | 3.49 | 1.74 | 3.06 |

Note. M = mean; SD = standard deviation.

Consistent with the second assumption, Linear Regression Analysis revealed significant correlations between the UCL scale active tackling and the BRS, the MHC-SF and the LOT-R post-measurement scores. A second also not anticipated pattern was found for the UCL scale passive reaction coping. The second hypothesis assumed that high scores on resilience, wellbeing and optimism will also be displayed in high scores on active tackling coping and in low scores on avoidant coping. Inconsistent with the second assumption no significant correlations were found between the UCL scale avoidant coping and the BRS, the MHC-SF and the LOT-R post-measurement scores. Table 6 illustrates the results of the Linear Regression Analysis, for the UCL scales active tackling, avoidant coping and passive reaction coping.

***Table 6.***
Linear Regression Analysis results divided per UCL subscale.

| | | UCL scale | | |
|---|---|---|---|---|
| | | active tackling | passive reaction coping | avoidant coping |
| BRS | *R* | .63 | -.64 | .194 |
| | $R^2$ | .389 | .415 | .038 |
| | *F* | 20.3 | 22.7 | 1.25 |
| | *df* | 1, 32 | 1, 32 | 1, 32 |
| | *p* | < .0001*** | < .0001*** | .271 |
| MHC-SF | *R* | .39 | -.37 | .235 |
| | $R^2$ | .152 | .135 | .055 |
| | *F* | 5.71 | 4.9 | 1.88 |
| | *df* | 1, 32 | 1, 32 | 1, 32 |
| | *p* | .023* | .033* | .180 |
| LOT-R | *R* | .48 | -.55 | .198 |
| | $R^2$ | .233 | .305 | .039 |
| | *F* | 8.78 | 12.7 | 1.18 |
| | *df* | 1, 29 | 1, 29 | 1, 29 |
| | *p* | .006** | .001*** | .286 |

Note. UCL = Utrechtse Copinglijst; BRS = Brief Resilience Scale; MHC-SF = Mental Health Continuum Short Form; LOT-R = revised Life Orientation Test; R = multiple correlation; $R^2$ = multiple correlation squared; F = test value of one way ANOVA; df = degree of freedom.*p < .05, two-tailed. **p < .01, two-tailed. *** p < .001, two-tailed.

Scores on the UCL subscale active tackling were significantly predicted through the BRS, the MHC-SF and the LOT-R post-measurement scores, as shown in Table 5. The BRS predicted 38.9% of the variance within the active tackling scores, the MHC-SF explained 15.2% of the variance and the LOT-R accounted for 23.3% of the variance within the UCL subscale. Furthermore mentionable but not directly assumed via the second hypothesis is the predictive role of the MHC-SF subscale psychological wellbeing. The MHC-SF subscale psychological wellbeing explained 23.1% of the variance within the active tackling scores, with $R = .48$, $R^2 = .231$, $F(1,32) = 9.6$ and $p = .004$. On the other hand accounted the other two MHC-SF subscales emotional- and social wellbeing not for the variance within the active tackling scores ($R = .32$, $R^2 = .102$, $F(1,32) = 3.6$ and $p = .065$ for emotional- and $R = .16$, $R^2 = .025$, $F(1,32) = .81$ and $p = .374$ for social wellbeing).

Additionally, scores on the UCL scale passive reaction coping were significantly predicted by BRS, MHC-SF and LOT-R post-measurement scores as well. The post-measurement scores of the BRS explained 41.5% of the variance in the UCL passive reaction coping scores, the MHC-SF predicted 13.5% of the variance in the UCL scores and the LOT-R accounted for 30.5% of the variance in the passive reaction coping scores. Next to the overall MHC-SF, explained the subscale emotional wellbeing 28.7% of the variance within the UCL passive reaction coping scale, with $R = -.53$, $R^2 = .287$, $F(1,32) = 12.9$ and $p = .001$. The other two subscales, social- and psychological wellbeing accounted not for the variance within the UCL subscale ($R = .183$, $R^2 = .033$, $F(1,32) = 1.1$ and $p = .301$ for social- and $R = .29$, $R^2 = .085$, $F(1,32) = 2.9$ and $p = .095$ for psychological wellbeing).

Although assumed, no significant correlations were found between the BRS, the MHC-SF, the LOT-R and the UCL subscale avoidant coping, as shown in Table 5. The second hypothesis can be seen as partially verified. Furthermore mentionable, correlations of the BRS, the MHC-SF, the LOT-R and the UCL scale active tackling are found to be positive. High scores on the BRS, the MHC-SF and the LOT-R are linked to high scores on active tackling. Figure 2 demonstrates the found regression lines for the relation of the BRS, the MHC-SF, the LOT-R and the UCL scale active tackling.

**Figure 2.** Regression lines of the BRS, the MHC-SF, the LOT-R and the UCL scale active tackling

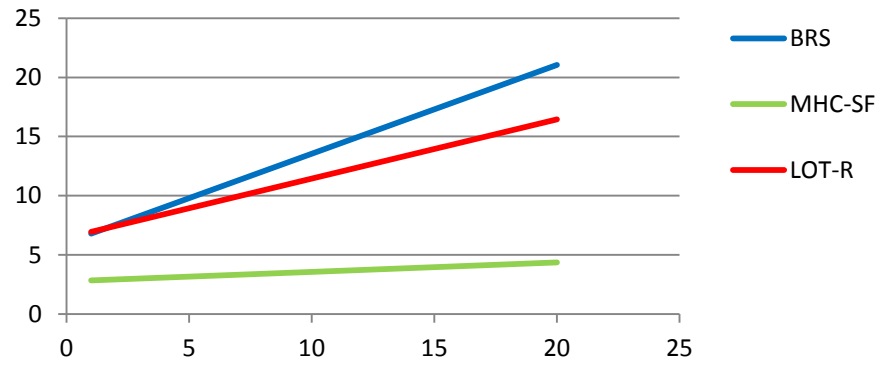


*Figure X*. Illustration of the positive correlations between the active tackling scale and the BRS, the MHC-SF and the LOT-R.

The correlations of the BRS, the MHC-SF, the LOT-R and the UCL scale passive reaction coping are one the other hand found to be negative. High scores on the BRS, the MHC-SF and the LOT-R are linked to low scores on passive reaction coping. Figure 3 illustrates the found regression lines for the relation of the BRS, the MHC-SF, the LOT-R and the UCL scale passive reaction coping.

**Figure 3.** Regression lines of the BRS, the MHC-SF, the LOT-R and the UCL scale passive reaction

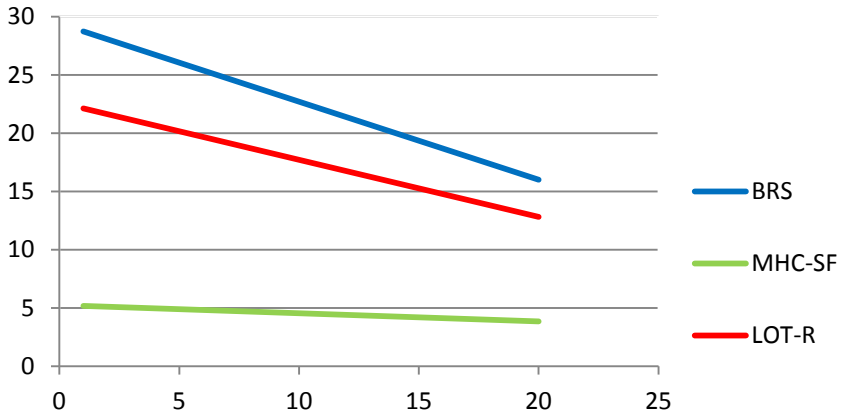


*Figure X.* Illustration of the negative correlations between the passive reaction coping scale and the BRS, the MHC-SF and the LOT-R.

## *4. Discussion*

### *4.1. Hypothesis one*

The first hypothesis concerning the enhancement in scores through future imagination is not verified by the current study. Although predicted by academic literature (Sools & Mooren, 2012; Waytz, Hershfield and Tamir, 2015; Peters et al., 2010; Meevissen et al., 2011), the future letter intervention did not account for the enhancement in resilience, wellbeing and optimism scores. In addition, comparison between the three intervention groups revealed no significant differences either. Respondents assigned to the future conditions, condition one and two, did not score significantly higher on resilience, wellbeing and optimism compared to respondents assigned to the past condition, condition three.

The rather small sample size can be seen as reason for not detecting the anticipated impact of future imagination. As already indicated, more than the half of the respondents had to be excluded from the analysis due to technical and procedural problems (see limitations). This left only thirty-one cases for the finding of an effect regarding the future; and additionally, illustrates an argument for a decreased likelihood of detecting an effect (Moore & McCabe, 2013). A statistical significant effect of future imagination on resilience, wellbeing and optimism levels was thus more likely to occur if the sample size was larger.

A second argument for not discovering the anticipated impact of future imagination can be seen in the notion that a small effect size is likely to exist. Small effect sizes require huger sample sizes for the detection of a significant difference (Moore & McCabe, 2013). If the sample size is too small for detecting the effect, the effect is overshadowed by randomness within the sample (Moore & McCabe, 2013). The small effect size, overshadowed by the randomness of the sample, applies to the current study. For one, as indicated above, analyses were conducted with a rather small sample of only thirty-one cases. Secondly, additional analyses, comparing pre- and post-measurement scores, revealed a significant increase in optimism. Respondents scored significantly higher on optimism after participation in the interventions. Although optimism scores increased, it is not possible to state with certainty which of the interventions lead to this increase. Since comparison between the three intervention groups did not reveal any significant difference. Moreover, a significant enhancement in scores was only found for optimism, which might indicate that optimism is more likely and more directly increasable through future and past interventions compared to resilience and wellbeing. This assumption is supported by the findings of Peters et al. (2010)

and Meevissen et al. (2011) who state that optimism was directly enhanced after participation in a best possible self (BPS) intervention. The BPS intervention is comparable to the future letter intervention. Due to the fact that similar instructions aiming at the imagination of a positive future are given, wherein all the goals and dreams attained are given to the respondents (Meevissen et al., 2011; also see Appendix B). A third reason for a small effect size, can be seen in the notion that resilience scores were likely to increase as well if the sample size was larger. Comparison between pre- and post-measurement scores of resilience revealed a trend, indicating that post-measurement scores were higher compared to pre-measurement scores. This trend was likely to reach statistical significance if the sample size and thus the differences between the intervention groups were larger. It is thus likely that the writing of future letters lead to increases in resilience, wellbeing and optimism scores, but that the increases in scores are too small for being detected by the analyses. Future research, aiming at a huger sample size has to be conducted to state with certainty if the future letter intervention is effective in enhancing resilience, wellbeing and optimism scores.

Another argument for the falsification of the first hypothesis can be found in the possible impact of past imagination. The imagination of a past event might affect levels of resilience, wellbeing and optimism as well. As indicated by Waytz, Hershfield and Tamir (2015), wellbeing can be increased by occasionally distancing oneself from the "present time and place" (p. 351). This distancing can take place via retrospection or via prospection. Thus through reflection on past events or through thinking positively about ones future (Waytz et al., 2015). The imagination of the past has thus, next to the imagination of the future, beneficial effects on an individual's amount of wellbeing (Libby & Eibach, 2011; Routledge, Wildschut, Sedikides, Juhl, & Arndt, 2012; Waytz, et al., 2015). Past as well as future imagination is thus likely to elicit increases in scores, which furthermore implies a cause for the fact that no significant differences between the three intervention groups were found. A possible explanation for the falsification might thus be seen in the differences between intervention groups which seemed to be not huge enough to provoke significant findings. An impact of the future letter conditions was more likely to occur if the control condition did not partake in an intervention.

The sub hypothesis concerning the impact of an increased frequency of future letters is not confirmed through the statistical analysis either. It was assumed that the proportion of future letters matter regarding the anticipated increase in resilience, wellbeing and optimism scores. The writing of four future letters was assumed to lead to huger score increases compared to

the writing of one future letter. Respondents assigned to condition one, which includes the writing of four future letters, did not score significantly higher on the BRS, the MHC-SF and the LOT-R, compared to respondents assigned to condition two, which includes the writing of one future letter.

Reasons for the falsification of the sub-hypothesis can be seen in the already above mentioned arguments. Especially the argument concerning the small sample size is mentionable. As indicated, the sample consists of only thirty-one cases, which were additionally unequally distributed across the three conditions. The least participants were presented in the first condition, closely followed by the third condition; most of the respondents were presented within the second condition. This uneven distribution, particularly with regard to the first condition, combined with the small sample size can account for the falsification of the sub-hypothesis. The first condition, which asked for the writing of four future letters, includes only eight cases. The amount of eight cases can be seen as rather too small to find a statistical significant difference, although a rather small effect size masked by the randomness within the sample is not excludable.

The first hypothesis, with its sub-hypothesis both had to be rejected. Future research should thus aim at a larger sample size to state with certainty and more clearness if the future letter intervention can lead to enhances in resilience, wellbeing and optimism.

### *4.2. Hypothesis two*

The second hypothesis, testing for the relation of avoidance coping and problem focused coping with resilience, wellbeing and optimism, was at least partially verified by the present study. Respondents with high scores on resilience, wellbeing and optimism also displayed high scores on active tackling. However, high scores on the three concepts are not found to correlate to low scores on avoidance coping. Whereas the second subpart of the hypothesis is not directly verified, it has to be mentioned that correlations are found for resilience, wellbeing, optimism and the UCL scale passive reaction coping.

These findings are also provided and supported by the literature. Stratta et al. (2015) assumed a theoretical relation between coping and resilience. This relation was found to exist in the current study. The concept of resilience predicts most of the variance in the active tacking coping style, indicating that a strong correlation between the two concepts exists. As

already stated within the introduction, resilience and coping seem to be highly interrelated. Both concepts place emphasis on the possible responses to stress. The relationship between the two concepts allows for a buffering of the stressor. This leads to more successful outcomes and s the risk of developing stress related symptoms (Stratta et al., 2015). Campbell-Sills et al. (2006), indicate that task- or problem oriented coping is positively correlated to resilience whereas emotion- or avoidance oriented coping is negatively correlated. This was found within the current study as well, although not only for resilience but also for wellbeing and optimism. The concepts of resilience, wellbeing and optimism appear to correlate positively with the active tackling coping style and negatively with the passive reaction coping style.

Concerning the relationship of coping and wellbeing, it has to be stated that the concept of coping is understood as exerting impact on the amount of psychological functioning. Coping as a way of dealing effectively with certain amounts of stressors can perform influence on the perception of stressful events; and can intervene on the management of certain stressors, which is additionally understood as relating to wellbeing (Beasley et al., 2003). Whereas the current study confirms the assumed relation between coping and wellbeing, it has to be mentioned that the relation seemed to be weaker than the relation between the other two concepts and coping. Wellbeing accounted for the least amount of variance in the active tackling and the passive reaction coping style. This indicates that high scores on wellbeing predicted the least the amounts of active tackling and passive reaction coping, compared to resilience and optimism

Finally, concerning the relation between coping and optimism, it has to be stated that optimists are assumed to engage more often in problem focused coping strategies, compared to pessimists (Pietrowsky & Mikutta, 2012; Carver & Scheier, 2014). Besides, the tendency to use avoidance coping strategies is regarded to be lower in optimists compared to pessimists (Carver & Scheier, 2014). These assumptions can be verified by the present study as well. Optimism was found to correlate positively with active tackling and found to correlate negatively with passive reaction coping.

Despite the fact that correlations between three concepts and avoidance coping were not found; and despite the fact that the UCL did not make use of a problem focused coping scale (Schreurs & van de Willige, 1988), it has to be stated that the second hypothesis can nevertheless be answered reliably. The active tackling subscale, which was used instead of a problem focused coping scale, can be seen as an active way of dealing with problems

(Schaufeli & Dierendonek, cited by Schreurs & van de Willige, 1988). Active tackling can be described as a coping strategy wherein active intervening takes place and cognitive coping strategies are used (Schreurs & van de Willige, 1988). It seemed as if active tackling and problem focused coping are slightly different words for the same construct.

Regarding the unverified correlation between the UCL scale, avoidance coping and resilience, wellbeing and optimism, it can be stated that passive reaction coping also displays aspects of avoidance (Schreurs & van de Willige, 1988). According to Schaufeli and Dierendonek (cited by Schreurs & van de Willige, 1988) passive reaction coping can be seen as a defensive way of dealing with problems, which is an indication of avoidance. The second hypothesis can thus be seen as at least partially verified, especially when regarding the fact that positive correlations and negative correlations were found to exist in the assumed way. The three measures appear to correlate positively with the UCL scale active tackling and negatively with the UCL scale passive reaction coping, indicating that high scores are accompanied by high scores on active tackling and by low scores on passive reaction coping. The findings concerning the second hypothesis are thus also within the assumed way.

Whilst correlations between resilience, wellbeing, optimism and two different coping strategies were found, it has to be mentioned that literature also predicts the existence of several additional correlations, *e.g*. between emotion focused coping and optimism (Scheier & Carver, 1992) or between avoidance coping and the three measures (Pietrowsky & Mikutta, 2012; Stratta et al., 2015). Future research might thus be conducted aiming at the investigation of the additional assumable relations.

### *4.3. Limitations*

As already indicated, quite a few problems arose due to technical and procedural difficulties during the study. Technical problems, which emerged through the inefficient construction of the study, should be considered first. The present study made use of a continuous design, requiring independent participation. Moments for the performance of subparts were determined prior to the study start. Thus, respondents were asked to fill in the questionnaires on the first day of the study. After that, several dates were set for writing future or past letters. At the end, respondents were again asked to fill in the questionnaires a second time. It was assumed that respondents will pause the study after a certain subpart until the determined day for the next subpart was reached. It was furthermore supposed that respondents will be sent to

the next following subpart when re-engaging in the study. This implied that the same link for participation in the study was used over and over again. Unfortunately, the continuous design did not function as expected. During the study, various emails were received by respondents, indicating that they were sent back to the beginning and had to start anew with the study. This can be seen as an interruption in the study progress which might further lead to irritation under respondents and higher dropout rates; in this study, high dropout rates of more than 50% were found.

Secondly, procedural difficulties should be considered. A rather serious difficulty can be found in the amount of confusion which was experienced under respondents during participation. The reported confusion stems, on the one hand, from the formulations and the quantity of the instructions; and, on the other hand, from the amount of mails sent to the respondents. For example, every respondent received the instructions for the three different intervention groups prior to the actual study start. This is on its own a reason for the emergence of confusion. Respondents were likely to be less confused if they had received the appropriate instruction for their task only. Due to confidentiality reasons, the remembering's mails were sent to all respondents even if they were meant for a special condition. Additionally, instructions were rather broad formulated. Although instructions seemed to be formulated in a clear and explicit way, respondents appeared confused about how to proceed. This leads in addition to increased amounts of confusion, as reported by respondents.

### *4.4. Recommendations*

Future research should aim at the avoidance of the mistakes done in the current study. An alternative study setup can for example be endorsed, wherein three independent study parts are included. The first part should include the used questionnaires and the needed demographic questions. The second part should involve the instructions and the necessitated blocs to write the letter and the third part should again include the used questionnaires. The inclusion of a control question in all three parts makes it possible to link the independent study parts and individual answers to the respondents ID. This allows for the relation of answers and scores at the end of the study. Furthermore, respondents should receive several links for each part independently, instead of receiving again and again the same link over the course of the study. The alternative setup can be seen as counteracting the emergence of confusion, due to the fact that an increase in clarity concerning the purpose of the study is given. This is moreover likely to decrease the high dropout rates.

In addition, future research should aim at a control group which does not partake in the past letter intervention. As indicated above, the past letter intervention was also likely to affect the scores on resilience, wellbeing and optimism. Future research aiming at clarifying the role of future imagination should thus include a control group which participates in another or none intervention at all.

Moreover, with regard to the interrelated role of coping, future research might be conducted with a larger sample. As stated, correlations are only found for active tackling and passive reaction coping, whereas literature predicts that other correlations with resilience, wellbeing and optimism exist as well (Scheier & Carver, 1992; Pietrowsky & Mikutta, 2012; Stratta et al., 2015). The use of a huger sample increases the likelihood to detect more correlations, as for example between avoidance coping and the three measures (Pietrowsky & Mikutta, 2012; Stratta et al., 2015). Future research might thus be conducted to investigate additional correlations.

### *4.5. Conclusion*

The present study is regarded as relevant, irrespective of the difficulties which surrounded it. For one, it was informative. Future research can aim at the avoidance of mistakes which occurred during the present study. Aspects, which are in need of improvement, can be developed further and can then lead to a more powerful study. The improved study is also likely to encounter fewer difficulties. On the other hand, the interrelationship between resilience, wellbeing, optimism and coping can be clarified further. The findings of the current study support academic literature, indicating that the findings are generalizable. This generalizability of the current findings furthermore supports the found relations between the concepts, indicating that *e.g.* resilient individual's make indeed more often use of an active way of dealing with problems compared to less resilient individuals. The findings concerning the second hypothesis are thus rather reliable.

Second, several aspects have been learned through the conduction of the present study, which are realizable for future research. For example, it is advisable to fit the information which is dealt with to the respondents. Giving respondents special information which is not directed to them spreads a lot of confusion and is thus to prevent. Additionally, information given to the respondents has to be short and obvious. Respondents did not always read the information as good as one might suggest. Overseeable and short information will thus prevent mistakes.

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## *5. Appendix*

## **Appendix A:** Research information sheet, handed out before the study started.

Beste deelnemer,

Hartelijk dank dat u de tijd wilde nemen voor ons onderzoek! U helpt ons niet alleen afstuderen, maar draagt ook (volledig anoniem!) bij aan wetenschappelijke kennis over de kracht van toekomstverbeelding en/of herinnering.

**Over het onderzoek**

| | |
|---|---|
| *Duur* | 14 dagen |
| *Startdatum* | 18 april 2016 |
| *Einddatum* | 01 mei 2016 |

*Opzet*

- **Dag 1:** begin van het onderzoek door het invullen van een online vragenlijst (ong. 15 min), na het invullen van de vragenlijst wordt u door het systeem automatisch en willekeurig toegewezen aan een conditie.
- **Dag 2 – 13:** Het is de bedoeling dat u brieven gaat schrijven gericht op het verleden of de toekomst. Er zijn 3 condities. Het systeem bepaalt willekeurig in welke conditie u terecht komt. **Het is de bedoeling dat u de brieven op een bepaalde datum schrijft; dus niet meteen op dag 1 en niet allemaal achter elkaar op dezelfde dag of direct opeenvolgende dagen.** U krijgt daarvoor een herinneringsmail. U hoeft alleen maar te onthouden in welke conditie u zit. Voor het schrijven van de brieven is geen enkele ervaring vereist! U hoeft geen schrijver te zijn of te willen worden. Schrijf vanuit uw gevoelens en gedachten, er is geen goed of fout. Verderop in deze informatiebrief staan tips voor het schrijven van de brief, maar u hoeft zich hier niet blindelings aan te houden. Ze dienen slechts als handvatten.
- **Dag 14:** afsluiten van het onderzoek door het invullen van dezelfde online vragenlijst als waarmee begonnen is

**Herinnerings e-mails**

Het is de bedoeling dat u de brieven op een bepaalde datum schrijft; dus niet meteen op dag 1 en niet allemaal achter elkaar op dezelfde dag of direct opeenvolgende dagen. U krijgt daarvoor een herinneringsmail. U hoeft alleen maar te onthouden in welke conditie u zit. Helaas is het niet mogelijk om automatisch via het systeem herinneringsmails te sturen. Ook mogen we geen handmatige e-mail selectie maken op basis van de condities. Hierdoor kan het voorkomen dat u meerdere mails ontvangt die niet direct voor u bestemd zijn. Alvast excuses hiervoor! De mail zal zijn gericht aan één van de onderzoekers en alle overige mailadressen zullen worden opgenomen als BCC en zijn daarom niet zichtbaar voor andere deelnemers.

**Alle condities beginnen en eindigen met dezelfde vragenlijst op dag 1 (18 april 2016) en dag 14 (1 mei 2016).**

**Tips voor het schrijven van de brieven**

*Toekomst*

Stelt u zich voor dat u in een tijdmachine stapt en reist naar een voor u gewenste toekomst. Gebruik uw verbeeldingskracht: Bedenk dat het gaat om iets wat nog niet gebeurd is en dat het een kans is om te verzinnen wat er zou kunnen gaan gebeuren. Het gaat om een gewenste toekomst. Stelt u voor dat een wens, verandering of droom in uw leven is uitgekomen, dat u iets heeft bereikt wat u graag wilde, een bepaald probleem heeft opgelost, of een goede manier heeft gevonden om hiermee om te gaan. Stelt u zich zo levendig mogelijk voor waar en wanneer u zich bevindt als u in de toekomst bent aangekomen. U sluit de brief af met een boodschap vanuit de toekomst aan uzelf in de huidige tijd.

*Verleden*

Stelt u zich voor dat u in een tijdmachine stapt en reist naar een voor u gewenst punt in het verleden. Gebruik uw verbeeldingskracht: Bedenk wat er gebeurd is, wat dat op dat moment voor u betekende en wat dat moment in uw latere leven betekend heeft. Stelt u zich zo levendig mogelijk voor waar en wanneer u zich bevindt als u in het verleden bent aangekomen. U sluit de brief af met een boodschap voor uzelf vanuit uw huidige kennis (u wenst uw vroegere zelf dus iets toe of geeft raad / advies).

*Algemeen*

- We vragen u zo gedetailleerd mogelijk te schrijven, maar bepaalde details mag u gerust weglaten (vb: details die zo persoonlijk en/of vol emotie zijn dat u ze liever niet deelt)
- Vertel uw verhaal over een concrete dag, een specifiek moment, of een concrete gebeurtenis.
    - Geef details over de situatie (wie, wat, waar, hoe, waarom, betekenis)
    - Vertel hoe u daar gekomen bent, wat bijvoorbeeld het meest heeft geholpen en hoe u tegen de gebeurtenis aankijkt
- Waar bent u?
    - De plaats, plek of ruimte waaraan u kunt denken: ruimte, aarde, Nederland, ander land, eigen huis of tuin, bij vrienden / bekenden / vreemden thuis, stilte, lege ruimte, in de natuur, in een stad of dorp, op het water, in de lucht, rumoer, veel andere mensen, weinig andere mensen, alleen etc.
- Wat gebeurt er?
    - Hoe, wat, waar, waarom? Wat ging er aan vooraf? Wat gebeurde er achteraf?
    - Wie waren erbij betrokken? Beschrijf hun gedrag en woorden.
- Wanneer bent u daar?
    - Dit bepaalt u zelf, het mag zelfs 1 uur in de toekomst of het verleden zijn
- Welke betekenis heeft deze gebeurtenis voor u?
    - Op het moment zelf en in het verdere leven
- Sluit af met een boodschap, raad of advies aan uzelf of aan anderen

Ben je student en doe je mee voor Sona-punten? Let op de instructies in de online omgeving!

## **Appendix B:** Instruction regarding future letters.

***Instructies voor het schrijven van een brief vanuit de toekomst***

De volgende aanwijzingen zijn tips om u een idee te geven wat de bedoeling is van de brief en waar u aan kunt denken. Voelt u vrij om vanuit deze aanwijzingen de brief op uw eigen wijze te schrijven**.**

Het schrijven van een brief vanuit de toekomst duurt **ongeveer 20 minuten (**sommige mensen hebben meer tijd nodig en sommige minder, neem de tijd die u nodig hebt).

Probeer niet teveel te denken, schrijf wat er **spontaan** in u opkomt over de toekomst. We zijn geïnteresseerd in uw eigen, persoonlijke ervaring. Er is geen 'goed' en 'fout'. Ook als u geen "schrijver" bent, kunt u meedoen. Er zijn **geen speciale schrijftalenten** vereist.

*Waarover gaat de brief?*
Stel u voor dat u in een tijdmachine stapt en reist naar een voor u **gewenste** toekomst.
Gebruik uw **verbeeldingskracht:** Bedenk dat het gaat om iets wat nog niet gebeurd is en dat het een kans is om te verzinnen wat er zou kunnen gaan gebeuren.
Stel u zich zo levendig mogelijk voor waar en wanneer u zich bevindt als u in de toekomst bent aangekomen.
U sluit de brief af met een **boodschap** vanuit de toekomst aan uzelf of aan anderen in de huidige tijd**.**

U heeft nu een globaal idee van de opdracht om een brief vanuit de toekomst te schrijven. Hierna volgen stapsgewijs enkele vragen die u helpen om de brief te schrijven.

***Instructies voor de brief:***

**a) Waar bent u in de toekomst?**

Voorbeelden van de plaats, plek of ruimte in de toekomst waaraan u kunt denken zijn Nederland of een ander land, op aarde of in de ruimte; in uw eigen huis of tuin, buitenshuis, in de natuur, in een stad of dorp, op het water, in de lucht; op een plek met veel andere mensen of juist een lege ruimte; een kleurrijke ruimte? Een lawaaierige ruimte of stille? etc.

**b) Wanneer bent u daar?**

Het tijdstip in de toekomst bepaalt u zelf, dit kan 1 uur, dag, een week, of jaren later zijn.

**c) Aan wie schrijft u de brief?**

Wie: Bedenk aan wie u de brief wil schrijven: aan uw huidige ik of aan iemand anders (bijvoorbeeld uw kind of kleinkind, leeftijdgenoten, of de volgende generatie, etc.). En hoe spreekt u deze persoon aan? (lieve, beste, geachte, etc.).

**d) De brief van uit de toekomst**

U kunt nu de brief gaan schrijven.

- Het gaat om een **gewenste** toekomst: Stel u voor dat een wens, verandering of droom in uw leven is uitgekomen, dat u iets heeft bereikt wat u graag wilde, een bepaald probleem heeft opgelost, of een goede manier heeft gevonden om hiermee om te gaan.
- Vertel uw verhaal over **een concrete dag, een specifiek moment, of een concrete gebeurtenis.** Geef details over wie, wat, waar, hoe de gewenste toekomst eruit ziet.
- Vertel **hoe u daar gekomen bent,** wat bijvoorbeeld achteraf het meest heeft geholpen en hoe u (dan) op het leven van nu terugkijkt.
- Sluit de brief af met een **boodschap** aan het heden.

**e) Hoe wilt u de brief ondertekenen en met welke afsluitende groet?**

## **Appendix C:** Instruction regarding past letter.

***Instructies voor het schrijven van de brief over het verleden***

De volgende aanwijzingen zijn tips om u een idee te geven wat de bedoeling is van de brief en waar u aan kunt denken. Voelt u vrij om vanuit deze aanwijzingen de brief op uw eigen wijze te schrijven**.**

Het schrijven van een brief vanuit de toekomst duurt **ongeveer 20 minuten (**sommige mensen hebben meer tijd nodig en sommige minder, neem de tijd die u nodig hebt).

Probeer niet teveel te denken, schrijf wat er **spontaan** in u opkomt over de toekomst. Er is geen 'goed' en 'fout'. Er zijn **geen speciale schrijftalenten** vereist, ook als u geen "schrijver" bent kunt u meedoen.

*Waarover gaat de brief?*
Stelt u zich voor dat u in een tijdmachine stapt en reist naar een voor u **gewenst** punt in het verleden. Gebruik uw **verbeeldingskracht:** Bedenk wat er is gebeurd, hoe dat is gebeurd, wat de gebeurtenis op dat moment voor u betekende en wat dat moment in uw latere leven betekend heeft. Stelt u zich zo levendig mogelijk voor waar en wanneer u zich bevindt wanneer u in het verleden bent aangekomen.
U sluit de brief af met een **boodschap** voor uzelf vanuit de huidige tijd (uw huidige kennis).

***Instructies voor de brief:***

**a) Wanneer bent u daar?**
Het tijdstip in het verleden bepaalt u zelf, dit kan 1 uur, dag, een week, of jaren later zijn.

**b) Aan wie schrijft u de brief?**
Wie: Bedenk *aan wie* u de brief wil schrijven: aan uw huidige ik of aan iemand anders (bijvoorbeeld uw kind of kleinkind, leeftijdgenoten, of de volgende generatie, etc.). En hoe spreekt u deze persoon aan? (lieve, beste, geachte, etc.).

**c) De brief van uit het verleden**
U kunt nu de brief gaan schrijven.
- Het gaat om een **gewenst verleden**: Stel u voor dat een wens, verandering of droom in uw leven is uitgekomen, dat u iets heeft bereikt wat u graag wilde, een bepaald probleem heeft opgelost, of een goede manier heeft gevonden om hiermee om te gaan.
- Vertel uw verhaal over **een concrete dag, een specifiek moment, of een concrete gebeurtenis.** Geef details over wie, wat, waar, hoe het gewenste verleden eruit ziet.
- Vertel **hoe u daar gekomen bent,** wat bijvoorbeeld achteraf het meest heeft geholpen en hoe u (dan) op het leven van nu terugkijkt.

- Sluit de brief af met een **boodschap** aan het heden.

**d) Hoe wilt u de brief ondertekenen en met welke afsluitende groet?**